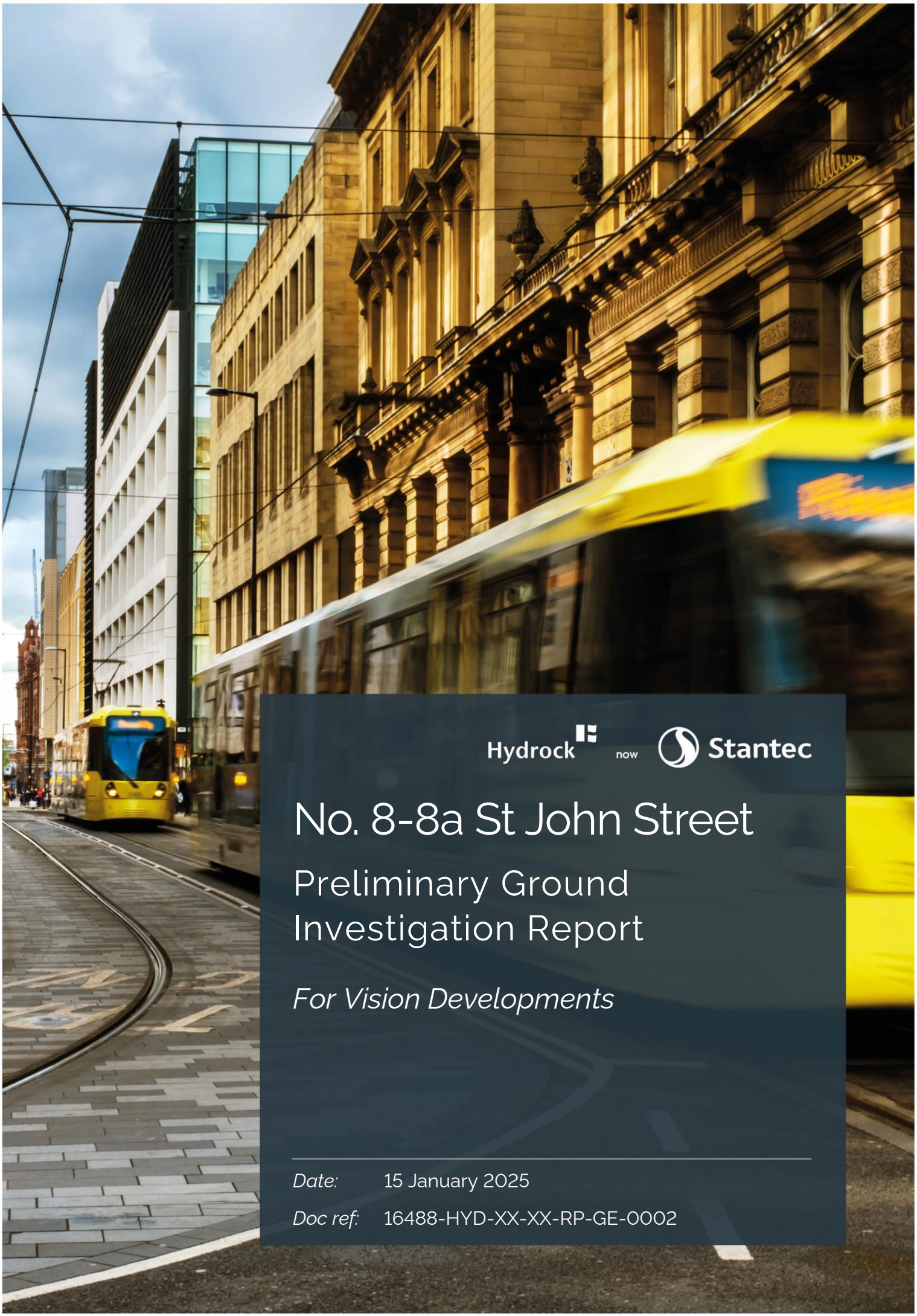

Hydrock now Stantec

No. 8-8a St John Street

Preliminary Ground Investigation Report

For Vision Developments

Date: 15 January 2025

Doc ref: 16488-HYD-XX-XX-RP-GE-0002

Document control sheet

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Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of the above-named Client, under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

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Executive summary

Site information and setting	
Objectives	Preliminary Ground Investigation Report.
Client	Vision Developments.
Site name and location	No. 8-8a St John Street, Manchester, M3 4DN.
Proposed development	Hydrock understands that the proposed development is to comprise a two-storey residential dwelling in the north with a private garden in the centre. The remainder of the centre of the site will be a shared landscaped area for users of 8-8a St John Street. The development will also include the refurbishment of the grade II listed buildings in the south. 8-8a St John Street will be refurbished for residential use with a three-storey extension onto the north west of the property.
Site description	The site is flat and rectangular in shape. The centre and north are block paved and include raised planters. In the south of the site there are two adjoined 3 storey properties, No. 8 is mid terraced and No. 8a is an end terrace with a basement accessed via Longworth Street, it is assumed No 8 also has a basement, both are understood to be occupied by office space.
Desk study summary	
Topography	The site is flat at approximately 30m AOD.
Hydrology	There are no recorded surface water features within 250m of the site boundary.
Site History	» In 1851 nine houses are recorded across the entire eastern section of the site numbers 8 and 8a St John Street and No. 6 to 16 Longworth Street detailed on the 1948 map. Up to ten small sheds are shown on the western boundary. No 1 passage transect north to south in the north west of the site. The site remains in this configuration until 1951. » In 1951 houses No. 6 and 8 (Longworth Street) are no longer recorded, in 1962 houses No. 10, 12 and 14 are no longer recorded and from 1980 No. 16 is no longer recorded. The northern site area was used for car parking until 1985. » From 1985 the site remains in its current configuration with 8 and 8a St John Street in the south of the site and six brick-built planters in the centre and north.
Geology	The geology of the site is superficial deposits comprising of Glaciofluvial Sheet Deposits underlain by bedrock comprising of the Chester Sandstone Formation.
Geotechnical Conclusion of the Desk Study	» Variable Made Ground - settlement or differential settlement of foundations, floor slabs, roads, and infrastructure elements. » Low strength, compressible ground – risk of shear failure and excessive settlement of foundations, roads, and infrastructure elements. » Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulphate bearing soils. » Loose Made Ground or Weathered Chester Formation and shallow groundwater, leading to difficulty with excavation due to trench instability. » Existing Basement, possible lateral pressure exerted on the basement by foundations of the proposed extension. » Potential for obstructions and the risk of instability of excavations with the impact on construction staff, vehicles, and plant operators. » Potential for unforeseen ground conditions and the risks associated with limited data.
Hydrogeology	The Glaciofluvial Sheet Deposits are designated as a secondary A aquifer and the Chester Formation as a Principal Aquifer.
Radon	The radon risk is reported in the environmental report. The guidance indicates that the site is not in a Radon Affected Area and no radon protection measures are required.

UXO risk	Risk of UXO is low.
Preliminary conceptual site model based on desk study	
Potential contaminant sources	» Made Ground, associated with former housing including elevated concentrations of metals, metalloids, petroleum hydrocarbons, asbestos fibres, Asbestos Containing Materials (ACM) and PAH (S01). » Asbestos within existing buildings (S02). » Ground gases (carbon dioxide and methane) from deep Made Ground associated with former terraced houses possibly including backfilled basements (S03).
Ground model proven by investigation	
Ground and groundwater conditions encountered by investigation	The ground conditions as proven by the ground investigation comprise: » Hardstanding- between 0.0m and 0,1m comprising limestone flags or asphalt; » Made Ground – extending to 1.5 to 2.3m below ground level (bgl), comprising silty locally ashy GRAVEL and locally in WS02 sandy gravelly CLAY; » Glaciofluvial Sheet Deposits – below the Made Ground extending to 1.8m and 2.5m bgl, medium dense orangish brown sandy GRAVEL; over » Weathered Chester Formation – between 2.5m and >3.7m bgl, comprising a medium dense to dense reddish brown gravelly clayey SAND. Groundwater was not encountered.
Summary of geotechnical conclusions	
Groundwork	Obstructions associated with the former basements should be anticipated. Heavy duty excavation plant/breaking equipment may be required to excavate the concrete slabs associated with the backfilled basement where present under the proposed dwelling. The Made Ground is unstable and excavation collapse could occur for excavations put down for a long period of time. Water seepages into excavations are likely to be adequately controlled by sump pumping.
Foundations	Additional ground investigation will be required to confirm the suitability of the below foundation recommendation: » Trench fill foundations on either the Glaciofluvial Sheet Deposits or Chester Formation, founding at a depth of approximately 2.2m bgl for the proposed building in the north and circa 2.5m bgl for the extension to the existing southern building. To confirm suitability for a trench fill foundation for the extension, trial pitting is recommended to confirm the stability of trenches put down onsite. Should the Made Ground be unstable and a trench fill foundation be unfeasible, a piled solution may be a suitable foundation solution for the proposed structure subject to design by a piling contractor and assessment of the lateral forces posed by piling on the existing basement. Floor slabs should be suspended due to depth of Made Ground.
Roads and pavements	For road / pavement design, a design CBR of 2.5 % is recommended.
Sustainable drainage	Soakaway drainage is considered unsuitable for this site due to Made Ground thickness.
Buried concrete	Design Sulphate Class - DS-1 and ACEC Class AC-1s.
Summary of geo-environmental assessment	
Human Health	» The slight exceedances of the GACs for beryllium, benzo(b)fluoranthene and dibenz(ah)anthracene within the Made Ground are considered marginal and not a risk to human health. As such no remediation is required
Existing Building	» Prior to refurbishment of the existing building, an asbestos refurbishment survey should be completed and any identified ACMs should be removed or encapsulated by an asbestos specialist reducing the quantified risk to low, so long as the specialist undertake the works in a controlled manner.
Phytotoxicity	» There will be a requirement to import clean Topsoil and Subsoil for landscaped areas.

Controlled waters	» The site is not considered to present a risk to controlled waters.
Potable water supply pipes	» Standard pipework is envisaged to be suitable. However, confirmation should be sought from the water supply company at the earliest opportunity.
Ground gases or vapours:	» The ground gas regime for the site is classed as Characteristic Situation (CS) 1. CS1 is the lowest risk and no ground gas protection measures are required.
Enabling works	
Earthworks	The site is small and flat and there is unlikely to be scope to reuse site won-materials. There will likely be offsite disposal required for arisings from reduced level excavations for foundations, drainage, and external areas.
Waste management	Excavated soils to be disposed of as waste, are likely to be classed as Non-Hazardous.
Future considerations	
Further work	Following the ground investigation works undertaken to date, the following further works will be required: » completion of an asbestos refurbishment survey and removal or management of any identified asbestos containing materials by an asbestos removal specialist prior to refurbishment; » a PAS 128 utility survey should be undertaken in particularly adjacent to the existing 8-8a St John Street to establish the locations unrecorded service entering the basement; » once the utility survey is completed additional ground investigation will be required adjacent to 8-8a St John Street, likely utilising a cut down cable percussive rig to obtain geotechnical parameters for the design of foundations for the proposed extension; » following removal of the brick planters across the site, trial pitting is recommended at the location of extension in the south to confirm the feasibility of trench fill foundations; » trial pitting at the location of proposed building in the north is also recommended to prove the depth to the Glaciofluvial Sheet Deposits below the backfilled basement bases; » there is potential for discussion with a piling contractors if trench fill foundations are not feasible for the proposed extension, should trench collapse limit excavation depths; » discussion and agreement with utility providers regarding the materials suitable for pipework; » discussions with regulatory bodies and the warranty provider regarding the conclusions of this report; » discussion with a structural engineer regarding the design of the trench fill foundation if greater than 2.5m bgl; » provision of geotechnical design for the Category 2 structures (foundations); and » testing of any imported Topsoil and Subsoil, validation of growing medium depths, submission of a letter report to the local authority for acceptance.

This Executive Summary forms part of Hydrock Consultants Limited report number 16488-HYD-XX-XX-RP-GE-0002 and should not be used as a separate document.

1. Introduction

1.1 Terms of reference

In July 2024, Hydrock Consultants Limited (trading as Hydrock now Stantec) was commissioned by Vision Developments (the Client) to undertake site investigation, comprising a Phase 2 ground investigation at No. 8-8A St John Street, Manchester. The site is located at No. 8-8a St John Street, Manchester, M3 4DN.

Hydrock understands that the proposed development is to comprise a two-storey residential dwelling in the north with a private garden in the centre. The remainder of the centre of the site will be a shared landscaped area for users of 8-8a St John Street. The development will also include the refurbishment of the grade II listed buildings in the south. 8-8a St John Street will be refurbished for residential use with a three-storey extension onto the north west of the property.

The proposed site plan is shown on Tim Groom Architects Drawing, referenced 1084-TGA-ZZ-ZZ-DR-A-95201_P03 presented in Appendix A.

The investigation works have been undertaken in accordance with Hydrock's proposal referenced (16488-GNST-FP-GE-0001, Dated May 30th 2024) and the Client's instructions to proceed (via email dated 4th June 2024).

1.2 Objectives

The works have been commissioned to support the planning application and to assist with the design of the development.

The objectives of the Phase 2 Ground Investigation are:

- to resolve any geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023);
- to identify any geo-environmental mitigation requirements to enable development to progress; and
- to provide preliminary geotechnical recommendations for design.

1.3 Scope

The Hydrock Ground Conditions Desk Study Report (ref: 16488-HYD-XX-XX-RP-GE-0001) was issued in September 2020 and an updated version issued on 10th July 2024.

The scope of the Phase 2 Ground Investigation comprises:

- a preliminary ground investigation including windowless sampling to:
  - obtain data on the ground and groundwater conditions of the site;
  - allow collection of samples for geotechnical and chemical laboratory analysis;
  - allow geotechnical field tests to be undertaken;
  - install gas and groundwater wells;
- gas concentration and groundwater level monitoring;
- groundwater sampling;
- geotechnical and chemical laboratory analysis;
- updating of the preliminary Ground Model;
- preparation of a geotechnical risk register;

- presentation of an initial geotechnical design recommendations;
- formulation of an updated Conceptual Site Model (CSM), including identification of any plausible contaminant linkages;
- completion of a generic quantitative risk assessment of any identified chemical contaminants to establish 'suitability for use' under the current planning regime;
- discussion of any potential environmental liabilities associated with land contamination (soil, water, and gas); and
- identification of outline mitigation requirements to ensure the site is 'suitable for use'.

1.4 Available information

The following documents, reports etc have been provided to Hydrock by the Client for use in the preparation of this report:

- Tim Groom Architects. 6th January 2025. 'Proposed Site Plan, St John Street, Manchester', Ref: 1084-TGA-ZZ-ZZ-DR-A-95201_P03.

It is understood that the Client commissioned and or has obtained assignment of the above document and Hydrock has assumed full reliance can be placed upon its contents.

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015+A1:2020, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'. The geo-environmental section of this report is written in broad accordance with BS 10175:2011+ A2:2017 and EA LCRM (2023).

Preliminary intrusive ground investigation work and testing. The information from the desk study and the ground investigation are used to develop the Conceptual Site Model (CSM). This CSM is based on a ground model of the site physical conditions and an exposure model of the possible contaminant linkages. The CSM forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines. This GQRA might lead to more Detailed Quantitative Risk Assessment (DQRA).

Professional judgement is then used to evaluate the findings of the risk assessments and to provide recommendations for the development.

The geotechnical section of this report is prepared in general accordance with BS EN 1997-1+A1: 2013, BS EN 1997-2:2007 and BS 8004:2015+A1:2020. This report constitutes a Ground Investigation Report (GIR) as described in Part 2 of Eurocode 7 (BS EN 1997-2) (EC7). However, it is not intended to fulfil the requirements of a Geotechnical Design Report (GDR) as specified in EC7.Where relevant the relevant requirements of the current edition of NHBC Standards have also been applied.

The geo-environmental and geotechnical aspects are discussed in separate sections. Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. Designers should take all aspects of the investigation into account.

Remaining uncertainties and recommendations for further work are listed in Section 9 and Section 10.

2. Phase 1 desk study review

2.1 Introduction

Hydrock Issued a Ground Conditions Desk Study Report for the site (ref: 16488-HYD-XX-XX-RP-GE-0001_P02 Version) on the 15th January 2025. This section is a summary of the pertinent information presented in the Desk Study.

A field reconnaissance survey was undertaken on 10th of July 2024 to visually identify potential geotechnical hazards warranting further assessment and contaminant sources and the general environmental setting to support an assessment of possible source-pathway-receptor linkages.

2.2 Site location

The is located on St John Street, 20m west of Deansgate and the 200m north east of the Science and Industry Museum. The National Grid Reference of the approximate centre of the site is 383457E, 397922N.

A site location plan showing the site red line boundary (Hydrock Drawing 16488-HYD-XX-XX-DR-GE-0001) is presented in Appendix A.

2.3 Site description

The site is flat and rectangular in shape. The centre and north are block paved and includes raised planters. In the south of the site there are two adjoined 3-storey, No. 8 is mid terraced and No. 8a is an end terrace with a basement accessed via Longworth Street, it is assumed No 8 also has a basement, both are understood to be occupied by office space.

The site features are shown on the site features plan 16488-HYD-XX-XX-DR-GE-0002) is presented in Appendix A.

2.4 Site history

Historical mapping reviewed from between 1851 to 2024, records the following historical uses:

- In 1851 nine houses are recorded across the entire eastern section of the site numbers 8 and 8a St John Street and No. 6 to 16 Longworth Street detailed on the 1948 map. Up to ten small sheds are shown on the western boundary. No 1 passage transects north to south in the north west of the site. The site remains in this configuration until 1951.
- In 1951 houses No. 6 and 8 (Longworth Street) are no longer recorded, in 1962 houses No. 10, 12 and 14 are no longer recorded and from 1980 No. 16 is no longer recorded. The northern site area was used for car parking until 1985.
- From 1985 the site remains in its current configuration with 8 and 8a St John Street in the south of the site and six brick-built planters in the centre and north.

2.5 Geology

The site is anticipated to be underlain by Made Ground, which is likely to be heterogeneous, associated with former building construction and demolition, possibly including backfilled basements, as well as possible Made Ground associated with the construction of the existing basement, present beneath 8-8a St John Street in the south of the site.

The superficial geology at the site is indicated to be Glaciofluvial Sheet deposits (Figure *2.1*) which historical boreholes within the area, suggest extend to between 3.00m and 4.00m bgl and the bedrock geology comprises the Chester Formation- Sandstone (Figure *2.2*) which is at least 300m in thickness.

There is a Normal Fault, trending approximately north west to south east, with a downthrow approximately 100m to the north east of the site. A Buried Channel is shown 147m south east of the site.

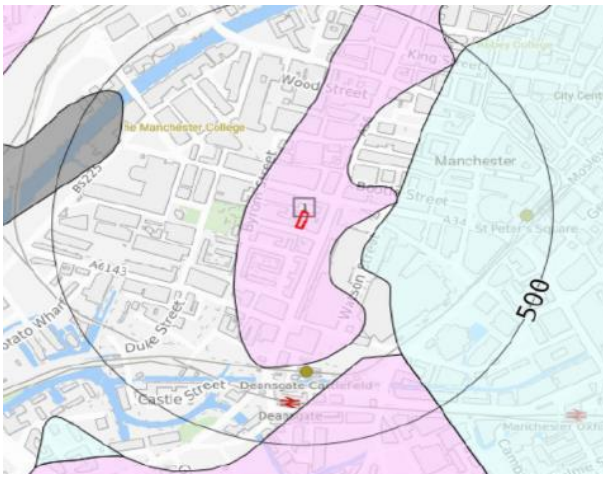

Figure 2.1: Superficial deposits.
(Reproduced with permission from Groundsure)

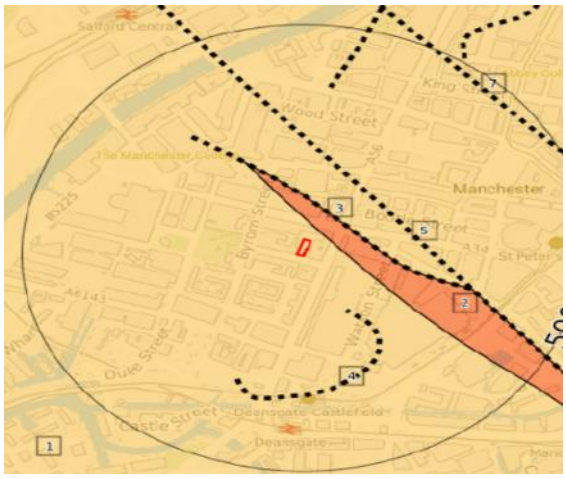

Figure 2.2: Solid geology.
(Reproduced with permission from Groundsure)

2.6 Hydrogeology and Hydrology

There are no recorded surface water features within 250m of the site boundary.

The Glaciofluvial Sheet Deposits are designated as a secondary A aquifer and the Chester Formation as a Principal Aquifer.

The site is not within a groundwater Source Protection Zone (SPZ) however there is a Source Protection Zone 3 for total catchment located 280m south-east of the site. There is one active licenced groundwater abstraction 780m north, utilised for industrial use for General cooling.

Shallow groundwater below the site will either drain south towards the River Medlock or East towards the River Irwell. Given the distance between the site River Medlock and River Irwell, shallow groundwater underlying the site is unlikely to be in direct hydraulic continuity with the surface water features.

The River Irwell is likely in direct hydraulic continuity with shallow groundwater in the Alluvium recorded 480m west. The River Medlock is likely to be in direct hydraulic continuity with shallow groundwater in the Glaciofluvial Sheet Deposits recorded 400m south.

2.7 Surface water flooding

The desk study information indicates the proposed development is in Flood Zone 1 (with a low probability of flooding from rivers or the sea).

The risk from surface water flooding (pluvial flooding) is recorded as negligible on the site.

No further consideration of flood risk is undertaken in this report. Specialist flood risk advice should be sought with regard to drainage and flooding.

2.8 Mining and mineral extraction

Although the Coal Authority (CA) record the site within a Coal Mining Reporting Area, the CA authority interactive viewer shows there to be no probable shallow coal workings recorded below

the site. The site is classed as a low-risk development area with regards to past coal mining. There are no mine entries or underground workings recorded within 2km of the site boundary.

A borehole SJ89NW220 drilled 190m north west, proved bedrock of red grey locally marly sandstone between 2.43m to 136.55m bgl. The BGS map of Manchester indicates that at least 300m of the Chester Formation overlies the coal measures.

Therefore, based on the above, the thickness of the Chester Formation in the surrounding area, lack of recorded mine entries or coal outcrops, the risk posed to site by coal mining is very low.

2.9 Waste management

There are no current or historical landfill site recorded within 250m of the site. There was one historical waste recycling sites recorded within 250m of the site. The site was situated 200m north east and was used as a recycling storage facility.

2.10 Radon

The radon risk is reported in the environmental report. The guidance indicates that the site is not in a Radon Affected Area and no radon protection measures are required.

2.11 Unexploded ordnance (UXO)

A preliminary UXO risk assessment desk study has been obtained (Report Reference EP11635-00) and below is a summary of the findings:

- No evidence of any current or former military activities within or in the immediate vicinity of the site;
- No evidence could be found to suggest that the site suffered any direct strikes from bombing during WWII;
- No high explosive bombs were recorded as landing in the immediate vicinity of the site;
- Several incidents are recorded in the vicinity of the site, all indicated as “fire bombs” on Manchester bomb mapping. This included one fire bomb dropped at a Church House just east of the site, across Longworth Road. Another was recorded just north of the site, across Artillery Street;
- Low-resolution aerial photography of the site indicates that the structures on site appeared to survive the war externally intact;
- Pre-and post-WWII OS mapping shows no structures on site were cleared or labelled as ‘ruin’ – both of which are often indicative of bomb damage; and
- Given that the site was occupied by apparently undamaged residential structures during the war, it is thought likely that the structures on site would have been regularly accessed.

Based on the above finding the risk from UXO is considered to be low. therefore, no further action is required for the subject site.

3. Initial conceptual site model

3.1 Introduction

The initial Conceptual Site Model (CSM) incorporates evidence from the site walkover, the Desk Study and previous investigations carried out at the site. The formulation of an initial CSM is a key component of the LCRM methodology, and incorporates: a ground model of the site physical conditions; and an exposure model of the possible contaminant linkages. It forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines.

3.2 Ground model

The preliminary ground model presented in Section 2 provides an understanding of the ground conditions and is the basis for preparing the preliminary geotechnical hazard assessment (Section 3.3) and the preliminary geo-environmental exposure model (Section 3.4).

3.3 Geotechnical hazard identification

3.3.1 Context

The preliminary geotechnical hazard identification has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents CS 641 and CD 622.

The following section sets out the identified geotechnical hazards and the development elements potentially affected (see Table G.1 in Appendix G for further information).

3.3.2 Geotechnical Conclusions

Plausible geotechnical hazards identified at the site are:

- Variable Made Ground - settlement or differential settlement of foundations, floor slabs, roads, and infrastructure elements.
- Attack of buried concrete by aggressive ground conditions – the development site may contain Made Ground and potentially sulphate bearing soils.
- Loose Made Ground and shallow groundwater, leading to difficulty with excavation due to trench instability.
- Existing Basement, possible lateral pressure exerted on the basement by foundations of the proposed extension.
- Potential for obstructions e.g. backfilled basements in north and centre of the site - risk of instability of excavations with the impact on construction staff, vehicles, and plant operators.
- Potential for unforeseen ground conditions and the risks associated with limited data.

3.3.3 Potential development elements affected

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs
- Construction staff, vehicles, and plant operators.
- Concrete below ground.

Health and safety risks to site Contractors and maintenance workers have not been assessed during these works and will need to be considered separately during design.

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment. The investigation is presented in Section 5 and the assessment is presented in Section 6.

3.4 Geo-environmental exposure model

3.4.1 Context

The preliminary exposure model is used to identify geo-environmental hazards and to establish potential contaminant linkages, based on the source-pathway-receptor (SPR) approach.

A viable contaminant linkage requires all the components of an SPR to be present. If only one or two are present, there is no linkage and no further assessment is required.

3.4.2 Potential contaminants

For the purpose of this assessment the potential contaminants have been separated according to whether they are likely to have originated from an on-site or off-site source.

3.4.2.1 Potential on-site sources of contamination

- Made Ground, associated with associated with former housing including elevated concentrations of metals, metalloids, petroleum hydrocarbons, asbestos fibres, Asbestos Containing Materials (ACM) and PAH (S01).
- Asbestos within existing buildings (S02).
- Ground gases (carbon dioxide and methane) from deep Made Ground associated with former terraced houses possibly including backfilled basements (S03).

3.4.2.2 Potential off-site sources of contamination

- Hydrocarbon fuels and solvents from the operation of former Timber Yards, Good Station or Stiffening Works including leakage from unspecified or unrecorded tanks, the pipework between tanks and pumps, and general spillage, together with uncontrolled disposal and spillage from waste receptacles (S04).
- Ground gases (carbon dioxide and methane) from organic materials in the artificial ground shown, 50m east (S05).

3.4.3 Potential receptors

The following potential receptors in relation to the proposed land use have been identified.

- People (neighbours, site end users) (R01).
- Development end use (buildings, utilities, and landscaping) (R02).
- Groundwater: Secondary A aquifer status of the Glaciofluvial Sheet Deposits and Principal aquifer status of the Chester Formation (R03).

3.4.4 Potential pathways

The following potential pathways have been identified.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).
- Methane/ carbon dioxide ingress via permeable soils and/or construction gaps (P02).
- VOC and petroleum hydrocarbon vapour ingress via permeable soils and/or construction gaps (P03).
- Root uptake by plant (P04).

» Migration of contaminant via leachate/dissolved phase migration through the unsaturated zone in the Glaciofluvial Sheet Deposits (P05).

» Migration of contaminant from the groundwater within the Glaciofluvial Sheet Deposits to the groundwater within the Chester Formation (P06).

Health and safety risks to site development contractors and maintenance workers have not been assessed as part of this study and will need to be considered separately.

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2023), are plausible in the context of this site and have been carried forward for investigation and assessment. The potential active pathways of moderate risk are summarised below within Figure 3.1.

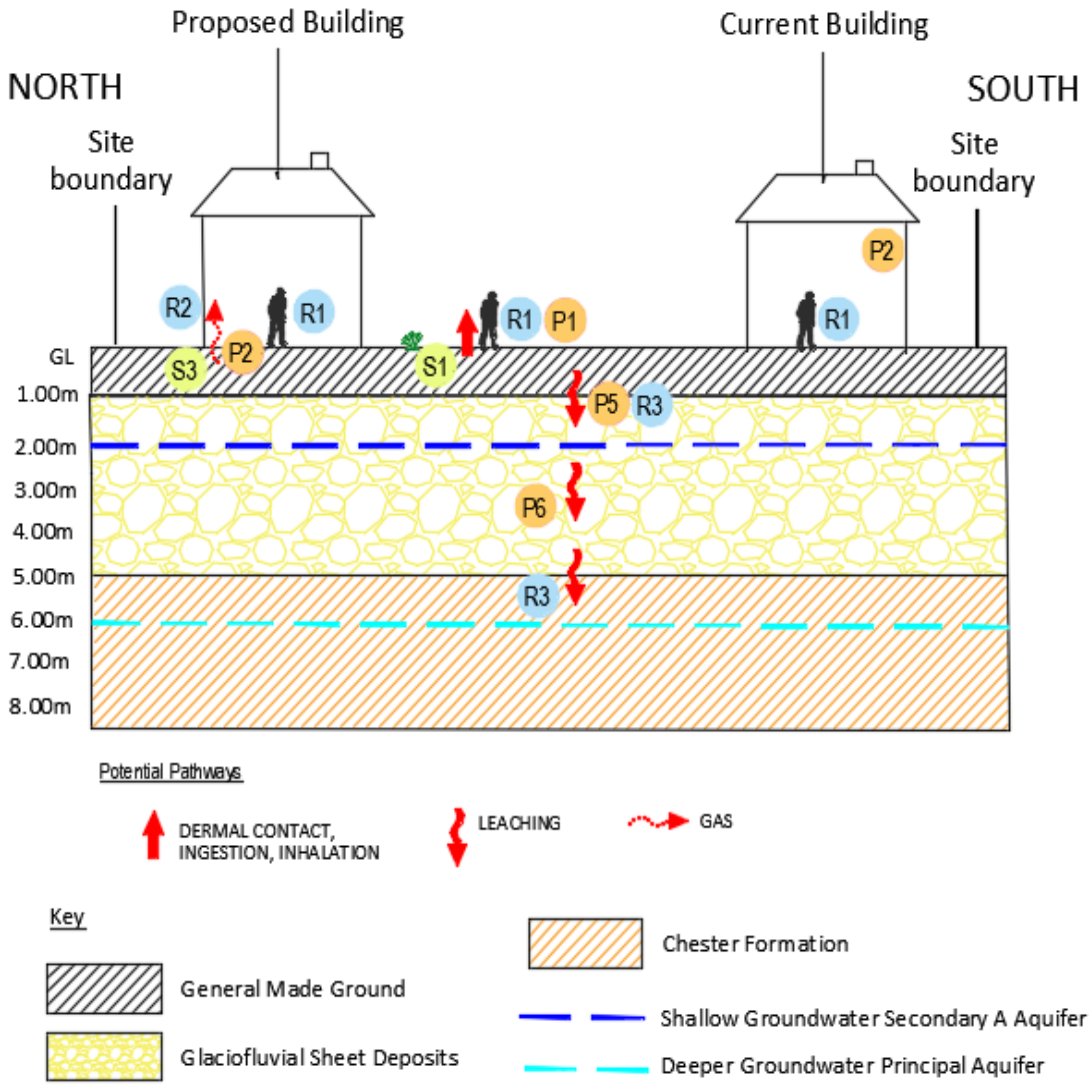

Figure 3.1: Potential active pathways of moderate risk and ground model

4. Ground investigations

4.1 Site works

The ground investigation works, including the rationale which was based on the findings of the preliminary risk assessment is summarised in Table 4.1.

The fieldwork took place in July 2024. The ground investigation locations were surveyed in using a topographic survey quality GPS and are shown on the Exploratory Hole Location Plan (Hydrock Drawing 16488-HYD-XX-XX-DR-GE-0004) in Appendix A.

The logs, including details of ground conditions, soil sampling, in situ testing and any installations, are also presented in Appendix C.

Table 4.1: Summary of site works

Activity	Method	No.	Name	Depth Range (m bgl)	In situ tests	Rationale
Drilling, Pitting and Probing						
Boreholes	Windowless sampler	4	WS01 to WS04	1.50-3.70	SPT	To investigate shallow ground conditions and install gas and groundwater monitoring wells.

Wells for monitoring groundwater levels and ground gas concentrations, and to facilitate the sampling of groundwater, were installed in three window sample boreholes. A summary of the monitoring well installations is presented in Table 4.2.

Table 4.2: Summary of monitoring installations

Location	Ground level (m OD)	Standpipe / piezometer diameter	Screen top and base depth (m bgl)	Screen top and base elevation (m OD)	Strata targeted
WS01	34.80	50	0.5 to 2.3	34.30 to 32.50	Made Ground
WS02	34.11	50	2.0 to 3.5	32.11 to 30.61	Weathered Chester Formation
WS03	33.97	50	0.5 to 1.2	33.47 to 32.77	Made Ground

4.2 Geo-environmental testing

4.2.1 Sampling strategy and protocols

Exploratory hole positions were determined by reference to the site conditions and uncertainties identified in the Initial Conceptual Model.

Certain specific features such as the areas of the former terraced houses and location of proposed new residential dwelling and new extension were targeted for specific investigation.

Samples were taken, stored, and transported in general accordance with BS 10175:2011+A2:2017.

4.2.2 Geo-environmental monitoring

Gas monitoring boreholes have been monitored on six occasions. The results are presented in Appendix D.

4.2.3 *Geo-environmental laboratory analyses*

The chemical test certificates are provided in Appendix E and summarised in the table below. Wherever possible, UKAS and MCERTS accredited procedures have been used.

The geo-environmental analyses undertaken on soils are summarised in Table 4.3.

Table 4.3: Geo-environmental analyses of soils

Determinand Suite	Made Ground	Glaciofluvial Sheet Deposits
Hydrock minimum suite of determinands for solids [1]	4	1
Speciated aliphatic and aromatic banding Total petroleum hydrocarbons by HS-GC/MS and GC/FID (Hydrock Tier 2 TPH Suite)	2	-
Benzene, toluene, ethylbenzene, and xylene (BTEX) by HS-GC/MS	2	-
MTBE (Methyl Tertiary Butyl Ether) by HS-GC/MS	2	-
Loss on Ignition	2	-

The soils chemical test data are interpreted and assessed in Sections 7.5.

4.3 Geotechnical testing

4.3.1 *Geotechnical laboratory testing*

The geotechnical tests undertaken are summarised in Table 4.4 and the test certificates are provided in Appendix D. Wherever possible, UKAS accredited procedures have been used.

Table 4.4: Summary of sample numbers for geotechnical tests

Test	Made Ground	Glaciofluvial Sheet Deposits	Chester Formation
Natural moisture content	1	-	1
Atterberg limits	1	-	1
Particle size distribution (wet sieve)	1	-	1
Water soluble sulphate and pH	3	-	-
Sulphate and aggressive chemical environment classification for buried concrete classification (full BRE SD1 suite)	3	1	-
Remoulded California Bearing Ratio at natural moisture content (unsoaked)	1	-	-

The geotechnical test data are summarised in Section 5.5 and interpreted in Section 6.

4.4 Constraints

The ground investigation technique was limited the window sampling due to access restrictions posed by the existing brick-built planters, gates and fencing splitting the north from the centre of the site. Adjacent to the existing 8-8a St John Street the location of WS04 was moved further north due to concerns regarding unrecorded private services entering the basement where the new extension is proposed.

[1] The Hydrock minimum suite of determinands for waters comprises As, B (water soluble), Be, Cd, Cr (total), Cr(VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulphide, pH, asbestos fibres, speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID), total phenols, fraction of organic carbon and free and "complex" cyanide species, if high total cyanide is detected

5. Ground investigation records and data

5.1 Physical ground conditions

5.1.1 Summary of strata encountered

The following presents a summary of the properties of the ground and groundwater conditions encountered, based on field observations, interpretation of the field data and laboratory test results, considering drilling, excavation and sampling methods, transport, handling, and specimen preparation.

All relevant data from the Hydrock investigation discussed in Section 4 are used from this point forward.

Details of the ground investigation works are provided in the logs in Appendix C, a summary of the ground model is presented in Table 5.1 and the individual strata are described in the sections below.

Table 5.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
Surface Cover – Flagstones or Asphalt	Ground Level	0.1	0.1	0.1
Made Ground	0.1	1.8 - >2.3	1.4 - >2.2	-
Glaciofluvial Sheet Deposits	1.8	2.5	0.7	-
Weathered Chester Formation	2.5	>3.7	Not proven	Not proven

5.1.2 Surface covering

The following surface cover was identified during the field reconnaissance and the fieldworks:

- Concrete flagstone covering approximately 40% of the site.
- Brick built planters (trees now removed) covering approximately 10% of the site.
- Asphalt Hardstanding covering approximately 15% of the site.
- Structures (8-8a St John Street, Offices) covering approximately 35% of the site.

5.1.3 Made Ground

Made Ground was encountered across the entire site, in the east of the site Made Ground was underlain by a concrete slab at 1.5m, this is potentially associated with basements within the terraced houses which were present in this area of the site. In the north west within WS02, Made Ground extended to 1.8m bgl,

In centre adjacent to the existing 8-8a St John Street Made Ground extended to 2.3m bgl until refusal was met on a layer of brick cobbles possibly laid during the construction of the adjacent basement.

The Made Ground predominantly comprised a very loose to loose dark grey or blackish grey sandy silty locally ashy GRAVEL with a high cobble content of brick. Gravel included granite, coal, brick, slate, concrete and localised pieces of clinker with fragments of ceramic pottery.

In the west of the site between 0.6m and 1.8m a cohesive Made Ground was present comprising a firm medium strength sandy gravelly CLAY with a medium cobble content. The gravel content of sandstone, brick and concrete.

5.1.4 *Glaciofluvial Sheet Deposits*

The Glaciofluvial Sheet Deposits were encountered in the western site area between 1.8 and 2.5m bgl and comprised a medium dense orangish brown sandy GRAVEL of sandstone, mudstone and quartz.

5.1.5 *Weathered Chester Formation*

The Weathered Chester Sandstone Formation was encountered in the west beneath the Glaciofluvial Sheet Deposits between 2.5m and 3.7m bgl. The Weathered Chester Formation was recovered as a medium dense to dense reddish brown gravelly clayey SAND. The gravel content of mudstone and sandstone.

5.2 Obstructions

Obstructions were encountered in several boreholes during the investigation. These intrusive locations are summarised in Table 5.2 and shown the Obstruction Plan (Hydrock Drawing 16488-HYD-XX-XX-DR-GE-0005) in Appendix A.

Table 5.2: Obstructions encountered

Stratum	Location	Depth (m bgl)	Description
Made Ground	WS01	2.3	Cobble of brick- suspected layer associated with construction of adjacent basement
Made Ground	WS03	1.5	Concrete slab- base of backfilled basement
Made Ground	WS04	1.5	Concrete slab- base of backfilled basement

5.3 Groundwater

5.3.1 *Groundwater observations and levels*

Groundwater was not encountered during the investigation or the post fieldwork monitoring.

5.3.2 *Groundwater summary*

During the ground investigation and post fieldwork monitoring no groundwater was encountered within the Made Ground, Glaciofluvial Sheet Deposits or Chester Formation. It is likely that groundwater will be present at depth within the Chester Formation.

Given the site is hardstanding across its entirety, infiltration of surface water and possible leaching of contaminants from the Made Ground will have been limited to negligible.

5.4 Ground gases (carbon dioxide and methane)

Records from the gas monitoring boreholes are presented in Appendix D and summarised in Table 5.3.

Six monitoring visits have been undertaken as part of the commission. The data are assessed in Section 7.7.

Table 5.3: Range of ground gas data

Stratum	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Steady flow rate (l/hr)	Comment
Made Ground	<0.1 – 0.2	<0.1 – 2.7	18.3 – 20.4	<0.1 – 1.0	Carbon Monoxide and Hydrogen Sulphide are below the limit of detection.
Weathered Chester Formation	<0.1	0.5 – 2.8	18.2 – 19.2	<0.1 – 0.7	

5.5 Geotechnical data

5.5.1 *Introduction*

Laboratory test results are contained in Appendix D with *in situ* test results shown on the relevant exploratory hole log or datasheet in Appendix C. The following sections summarise the main findings and provide interpretation where appropriate.

5.5.2 *Plasticity*

The volume change potentials in terms of NHBC Standard (Chapter 4.2) with respect to building near trees have been determined from the results of plasticity index tests on samples of soil. These are summarised in Table 5.4.

Table 5.4: Volume change potential

Stratum	No. of tests	Plasticity Index	Modified Plasticity Index	Plasticity designation	Volume Change Potential
		Max.	Max.		
Made Ground	1	14	7.7	Low	Low
Weathered Chester Formation	1	-	-	-	Non-plastic

5.5.3 *Particle size distribution*

Particle Size Distribution test (PSDs) results are summarised in Table 5.5 and summary descriptions and PSD plots of the material analysed are presented in Appendix D.

Table 5.5: PSD results summary

Stratum	No. of tests	Silt/Clay %	Sand %	Gravel %	General description
Made Ground	1	7	45	48	very sandy silty GRAVEL
Weathered Chester Formation	1	18	70	12	gravelly clayey SAND

5.5.1 *Soil strength*

Table 5.6 summarises information pertaining to the shear strength of the soils according to geological stratum. Factual results are summarised for laboratory tests and corrected Standard Penetration Tests (SPT N_{60}). Where the SPT N_{60} is used to infer shear strength by published correlation, this is also tabulated.

Table 5.6: Soil strength results and derived values

Stratum	No. of tests	SPT N_{60} (N-value) (range)	c_u (kPa)	c' (kPa)	phi' (°)	Method
Made Ground	1	14	85	0	27	SPT – windowless sampler boreholes.

*An f_1 value of 0.6 has been used based on a plasticity index of 14. (Tomlinson (2001), after Stroud).

5.5.2 Relative density

Table 5.7 summarises information pertaining to the relative density of the granular soils according to geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. SPT). Plots are presented in Appendix D.

Table 5.7: Relative density results and derived values

Stratum	No. of tests	Method	SPT N_{60} (N-value) (Range)	phi' (°)
Made Ground	7	SPT – windowless sampler boreholes (Peck et. al. (1967).	5 - 56	29
Glaciofluvial Sheet Deposits	1		31	36
Weathered Chester Formation	2		25 - 54	34- 41

The N_{60} values obtained in the Glaciofluvial Sheet Deposits in the west are of a dense density. The underlying Chester Formation in the west is of medium density becoming dense.

The N_{60} values obtained in the granular Made Ground are highly variable loose to dense density,

5.5.3 Compressibility

Table 5.8 presents a summary of the derived parameters for coefficient of consolidation and compressibility. The cohesive Made Ground is of medium compressibility.

Table 5.8: Summary of compressibility

Stratum	No. of tests / results	Method	Pressure range (kN/m^2)	Coefficient of volume compressibility (m_v) (m^2/MN)	Coefficient of consolidation (C_v) (m^2/yr)
Made Ground	1	Correlation with SPT N_{60}*	-	0.12	-

* An f_2 value of 0.60 has been used based on a plasticity index of 14. (Tomlinson (2001), after Stroud)).

** Derived mv of <0.01 recorded for the less weathered/intact bedrock layers

5.5.4 Subgrade stiffness

The subgrade stiffness (CBR and Subgrade Surface Modulus) results are summarised in Table 5.9.

Table 5.9: CBR results and derived values

Stratum	No. tests	Method	Subgrade Surface Modulus r (MPa) (Range)	CBR (%) (Range)
Made Ground	1	Laboratory remoulded sample at Natural Moisture Content (NMC)	>135	43.8
Where using the CD255 method, 'k' has been back calculated from the Equivalent CBR.				

5.5.5 *Sulphate content*

In accordance with BRE (Special Digest 1), the Design Sulphate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 5.10. The assessment summary sheets are presented in Appendix D.

The pH values in the Made Ground are in generally in the order 8.2-8.9 and Water-soluble sulphate (in 2:1 extract) in the order of 22.3 and 254mg/l which are of DS-1 sulphate design classification.

Table 5.10: Aggressive chemical environment concrete classification

Stratum	No. tests	DS	ACEC
Made Ground	3	DS-1	AC-1s
Glaciofluvial Sheet Deposits	1	DS-1	AC-1s

6. Geotechnical assessment

6.1 Geotechnical categorization of the proposed development

Eurocode 7, Section 2 advocates the use of geotechnical categorization of the proposed structures to establish the design requirements.

Provisionally given the unknown depth of the concrete slabs associated with the backfilled basements, the proposed dwelling in the north is classed as a Geotechnical Category 2 structure, due to the potential for deepening of foundation below the Made Ground.

The proposed extension will require further ground investigation to confirm a suitable founding stratum. However, given that the Made Ground is up to 2.30m deep, with the foundations requiring deepening adjacent to the existing basement the extension is considered to be Geotechnical Category 2 structure.

Based on the above, for the purposes of this investigation, the proposed structures have been classed as Geotechnical Category 2.

For Category 2 structures, the Geotechnical Category should be re-assessed at the design stage and specific geotechnical design (in addition to this investigation), is required.

Following ground investigation and as part of the assessment provided in the following section, the preliminary geotechnical hazard identification undertaken in Section 3.3 has been updated.

Assessment has been undertaken in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents HE-DMRB-G CS 641 and CD 622. The preliminary Geotechnical Risk Register following investigation is provided in Appendix G (Table J.3) and will need to be updated during future design works.

6.2 Characteristic design values

In accordance with BS EN ISO 1997-1 (EC 7), Hydrock consider the proposed structures would be classified as Category 2 structures. As part of the separate geotechnical design, the designer should determine the geotechnical design values.

Table 6.1 provides characteristic geotechnical values to assist the designer. These are based on laboratory testing, *in situ* testing and by professional judgement using published data together with knowledge and experience of the ground conditions. Care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing are required for certain purposes. The reader should refer to the original test results summarised in Section 5 and provided in Appendix C and Appendix D.

Table 6.1: Characteristic geotechnical values

Parameter	Bulk unit weight kN/m³	Effective angle of internal friction °	Effective cohesion kN/m²	Modulus of subgrade reaction (IAN73/06) MN/m²/m
Stratum	γ [a]	ϕ' [b c]	c' [d]	k [g]
Made Ground (granular)	17	29	0	135
Glaciofluvial Sheet Deposits	20	36	0	-
Weathered Chester Formation	18	34	0	-

Parameter	Bulk unit weight kN/m³	Effective angle of internal friction °	Effective cohesion kN/m²	Modulus of subgrade reaction (IAN73/06) MN/m²/m
Stratum	γ [a]	ϕ' [b c]	c' [d]	k [g]

a. Measured as part of the triaxial strength test and estimated based on the recommendations of BS 8004-2015+A1:2020.
b. Internal friction (φ') values for the granular in situ material derived from SPT data following the recommendations of Peck et al., (1967).
c. Internal friction (φ') values for the cohesive in-situ material derived from BS 8004-2015+A1:2020, where φcv' is derived from plasticity index. The use of φcv' in the analysis is considered to provide a conservative estimate of φ'.
d. BS 8002:1994 Code of practice for Earth retaining structures, British Standards institution.
e. Based upon the equilibrium long term CBR from CD255.

6.3 Groundwork

6.3.1 Site preparation

The redevelopment will involve demolition of the existing brick-built planters. This should be undertaken to an appropriate Specification to ensure any asset materials generated are geotechnically suitable for use.

Buried obstructions associated with the concrete slab at 1.50m associated with the backfilled basement which encroaches on the proposed residential dwelling in the north will require breaking out. There may be obstructions underlying the proposed extension adjacent to 8-8a St John Street which may require removal. Hard digging can be anticipated at 2.30m bgl should the dense layer which caused a refusal be present across the proposed extension footprint.

6.3.2 Groundworks

Following breaking out of hardstanding and obstructions, excavation of shallow soils should be readily undertaken by conventional plant and equipment. However, excavation through any buried construction may require heavy-duty excavation plant and the use of specialist breaking equipment.

Random and sudden falls should be expected from the faces of near vertically sided excavations put down at the site within the loose and heterogenous Made Ground.

Temporary trench support, or battering of excavation sides, is recommended for all excavations that are to be left open for any length of time and will be required where man entry is required. Particular attention should be paid to excavation at, or close to, site boundaries and adjacent to the existing 8-8a St John Street, where collapse of excavation faces could have a disproportionate effect. Given that 8-8a St John Street is classified as a Grade II listed property, liaison should be carried out with the local authority and Heritage authority prior to undertaking any excavations. adjacent to the property.

Prior to commencing excavations adjacent to the existing 8-8a St John Street, the locations of the unmarked services should be established, to ensure excavation works do not damage services, entering the existing the basement.

A risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations (2015); Construction Information Sheet 47: Inspections and Reports (2005) and HSG47: Avoiding Danger from Underground Services.

To ensure no loads are imposed on the sides of the excavation, spoil should not be placed immediately adjacent to the excavation. Spoil should be placed a suitable distance from the side of the excavation (as assessed by a competent person).

Based on site observations, no groundwater was encountered, as such, it is considered that should water be present any ingress to excavations should be slow. In these circumstances, groundwater control by sump pumping is likely to be sufficient.

6.3.3 Earthworks/reuse of site-won materials

The site is small and flat and there is unlikely to be scope to reuse site won-materials. There will likely be offsite disposal required from reduced level excavations for foundations, drainage, and external areas arisings.

6.4 Foundation recommendations

The recommendations in this report are based on the current NHBC Standards (2019).

In accordance with EC7, BS EN 1997-1+A1 (2013) the proposed residential dwelling and extension are Geotechnical Category 2 structures. Recommendations for Geotechnical Category 2 structures are presented to aid development proposals only. A separate geotechnical design will be required at the design stage.

Subject to detailed geotechnical design, the safe bearing pressures for foundations in this report take into consideration the risk of shear failure of the ground (ultimate limit state). However, they do not assess acceptable limits of settlement (serviceability limit state). Serviceability limit state assessment will need to be undertaken as part of the separate geotechnical design.

6.4.1 Trench fill foundations (proposed residential dwelling)

Following breaking out of sub-surface concrete obstructions underlying the proposed residential dwelling, trench fill foundations are considered suitable subject to completion of additional ground investigation below the sub-surface concrete slab to confirm the depth to the founding stratum. Foundation should terminate below any Made Ground at least 300mm into the undisturbed natural strata, which is likely to comprise medium dense gravel or sand associated with the Glaciofluvial Sheet Deposits or Weathered Chester Formation respectively.

For foundations where more than 2.5m depth are proposed, they should be designed by a Structural Engineer in accordance with the requirements of the NHBC Standards (Chapter 4.2.8) and NHBC Technical Requirement R5.

Foundation formations should be inspected by a geotechnical engineer or other suitably competent person to ensure the founding conditions are suitable and as indicated in this report. Any formation materials deemed as unsuitable should be excavated and replaced with lean mix concrete or deepened to suitable strata. If this is not possible, alternative solutions (such as piling) should be undertaken.

As the ground conditions at formation level are likely to be of variable type (possible if the Weathered Chester Formation is shallower on the eastern side), it is recommended that foundation concrete should be reinforced with mesh, installed at the top and bottom of the foundation, across the zone of variable soil conditions.

Foundation excavations should be protected from rainfall, inflow of surface water, frost, and freezing conditions. They should also be protected from drying out in hot dry weather.

Groundwater monitoring indicates groundwater is absent, but may be present seasonally at shallow depths as a sporadic, low flow groundwater table. Any water that collects at the base of the foundation excavations should be removed by pumping from a sump in the base.

6.4.2 *Trench fill foundations (proposed extension)*

It is likely that the existing basement is founded on the Weathered Chester Formation possibly present at circa 2.50m bgl. Following additional ground investigation, likely to comprise utilising a cut down cable percussive rig (to provide geotechnical parameter for foundation design) due to access constraints, the foundations for the extension should extend to the same level as the basement foundations where directly adjacent.

If Made Ground is present to depth of up to 2.30m across the area of the proposed extension, the entirety of the foundations will likely be founded at a similar level to the basement on the Chester Formation. Where Made Ground is shallower and proposed foundations are further from the basement, they could be designed as stepped at a 45-degree angle above those of the existing basement.

To confirm suitability for a trench fill foundation subject to the clearance of the existing onsite brick-built planters which restrict access, trial pitting should be completed to confirm the stability of trenches put down onsite. Should the Made Ground be unstable and a trench fill foundation be unfeasible, a piled solution may be a suitable foundation solution for the proposed structure subject to design by a piling contractor and assessment of the lateral forces posed by piling on the existing basement.

For foundations more than 2.5m depth are proposed, they should be designed by a Structural Engineer in accordance with the requirements of the NHBC Standards (Chapter 4.2.8) and NHBC Technical Requirement R5.

6.5 Ground floor slabs

In accordance with the NHBC standards, as Made Ground greater than 600mm thick are present at the site, it is recommended that suspended floor slabs with a void be adopted.

6.6 Roads and pavements

Based on the test results and subject to *in situ* testing during construction, it is considered likely an equilibrium CBR of 2.5% will be achievable on the granular Made Ground for external areas.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration. Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with DMRB IAN 73/06 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

6.7 Drainage

Generally, deep Made Ground is present across the site in the order of 1.8 and >2.3m bgl, with 700mm of granular Glaciofluvial Sheet Deposits overlying the principal aquifer. The site is of a small area of 0.05 hectares. To avoid allowing surface water to soakaway into the sensitive principal aquifer within the Chester Formation, subject to United Utilities acceptance, surface water should be discharged into the existing network on the adjacent Artillery or Longworth Street.

6.8 Buried concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005) and the information presented in Section 5.5.5:

- The shallow soils (Made Ground or Glaciofluvial Deposits) can be classified as Design Sulphate Class DS-1 and ACEC Class AC-1.

During additional ground investigation sulphate testing will be required within Weathered Chester Formation to confirm the concrete classification, should foundations be required to extend into the Weathered rockhead.

The designer should check and confirm the classification of concrete using the information presented in Appendix C and Appendix D during the design.

7. Geo-environmental assessment

7.1 Objectives

The objectives of the geo-environmental assessment present in the following sections are to:

- undertake a generic quantitative risk assessment in accordance with LCRM using published generic assessment criteria
- screen out contaminant linkages that do not potentially pose an unacceptable risk to defined receptors
- identify whether the ground conditions are suitable for the proposed land use from a land contamination perspective
- identify contaminant linkages that potentially pose an elevated risk or are associated with a level of uncertainty that warrants further consideration

7.2 Updated conceptual model

7.2.1 Updated ground model

The initial CSM developed from the desk study and field reconnaissance survey (Section 2) has been updated using the findings of the ground investigation and is presented in (Section 4). The updated CSM is the basis for the geo-environmental assessment presented in this section.

7.2.2 Updated exposure model

Following the ground investigation, the plausible contaminant sources, receptors, and pathways identified in the preliminary geo-environmental exposure model (Section 3.4) have been updated or confirmed as follows.

Sources

No potential sources have been removed from, or added to, the exposure model.

Receptors

No potential receptors have been removed from, or added to, the exposure model.

Pathways

No pathways have been removed from, or added to, the exposure model.

Using the updated ground model and updated exposure model, generic risk assessment is undertaken as presented below.

7.3 Risk assessment approach

Using the updated CSM, a Stage 1 Tier 2 generic quantitative risk assessment (GQRA) for identified receptors based on all media sampled has been undertaken in accordance with the principles of LCRM.

Firstly, the risks associated with the identified potential contaminant linkages have been estimated using standardised methods (typically involving comparison of site data with published 'screening values'). Secondly, where screening values are exceeded, the result has been evaluated in an authoritative review of the findings with other pertinent information to determine whether the exceedance is or is not acceptable in the site-specific circumstances.

The data sets used in the assessment comprise the analytical results obtained by Hydrock as listed in Section 4.2.

7.4 Data sets

The data set(s) used in this report is based on the conceptual site model and the proposed development, and based on the following site zones, with the data separated into Made Ground and Glaciofluvial Sheet Deposits. GAC based on a soil organic matter (SOM) of 1% have been adopted for all soils.

7.5 Human health risk assessment

7.5.1 Generic Assessment Criteria

The soil screening values used are Generic Assessment Criteria (GAC) (i.e. derived in accordance with EA CLEA guidance (2009) using the updated exposure model detailed in Defra SP1010 (2014), with the exception of published C4SLs. The term 'GAC' used in this report is inclusive of all generic soil screening values.

Based on the proposed development, generic assessment criteria (GAC) based on a default residential with homegrown produce CLEA land use scenarios have been adopted.

GAC are selected based on the following hierarchy:

- Category 4 Screening Levels (C4SL), where available.
- SoBRA Acute GAC for free cyanide, as acute dose toxicity is the primary risk driver.
- Hydrock GAC, derived by Hydrock as detailed in Appendix E.

7.5.2 Assessment Results

Based on individual test results that exceed the GAC, the chemicals of potential concern (CoPC) which require further assessment are summarised in Table 7.1. The results of the assessment are presented in Appendix E.

Table 7.1: CoPC in soils which require further assessment (human health)

CoPC	GAC (mg/kg)	GAC Source	No. samples	Min. (mg/kg)	Max. (mg/kg)	No. samples >GAC
Made Ground						
Beryllium	1.7	Hydrock GAC	4	0.41	1.8	1
Benzo(b)fluoranthene	2.6	Hydrock GAC	4	0.3	2.8	1
Dibenz(ah)anthracene	0.25	Hydrock GAC	4	<0.05	0.29	1
Glaciofluvial Sheet Deposits						
No Exceedances						

There are minor exceedances of the GAC for beryllium, benzo(b)fluoranthene and dibenz(ah)anthracene within the Made Ground, these are discussed in section 7.5.3.

During the ground investigation there was no recorded visual or olfactory evidence of contamination and in the two samples of Made Ground tested for petroleum hydrocarbons they were either below the laboratory limit of detection or slightly above.

There was no visible asbestos containing materials identified during the works and the laboratory testing found no positive identification for non-visible asbestos loose fibres within the Made Ground.

7.5.3 Risk evaluation

Beryllium is present in the Made Ground at a concentration of 1.8mg/kg, which is less than 1.06 times the GAC of 1.8mg/kg.

Benzo(b)fluoranthene is present in the Made Ground at a concentration of 2.8mg/kg, which is less than 1.08 times the GAC of 2.6mg/kg.

Dibenz(ah)anthracene is present in the Made Ground at a concentration of 0.29mg/kg, which is less than 1.18 times the GAC of 0.25mg/kg.

These minor exceedances are not considered to pose a significant risk to human health and no further consideration is required.

7.6 Controlled Waters Risk Assessment

7.6.1 Risk evaluation

Throughout time the site has been extensively covered by hardstanding which will have restricted/limited the leaching of infiltrating water through the Made Ground. Therefore, mobilising of contaminants from the Made Ground will have been negligible.

The chemical analysis completed on samples of Made Ground found no significant concentrations of leachable contaminants. Therefore, the leachable concentrations of contaminants from the Made Ground would be at marginal concentrations.

Throughout history and present time, the site has included hardstanding limiting infiltration of surface waters. It is understood that the proposed development will include minimal landscaping areas which will all be planted with trees or shrubs which will uptake infiltrating water, further limiting the infiltration of surface water through the Made Ground.

Based on the low concentrations of leachable contaminants within the Made Ground Hydrock does not consider the site to pose a risk to controlled water, Subject to local authority acceptance of the findings of the ground investigation.

7.7 Ground gas risk assessment

7.7.1 Assessment Criteria

The risks associated with the ground gases methane (CH_4) and carbon dioxide (CO_2) have been assessed using BS 8485:2015 +A1:2019.

7.7.2 Data adequacy

As per BS8576:2013 Decision Matrix for Initial Monitoring, it is judged from the available evidence that the gas generation potential at the site is very low to low (due to the presence of Made Ground with TOC concentrations of less than 5%) and as per Tables 5.5a and 5.5b CIRIA C665, the sensitivity of the development is high (due to residential end use with private garden). In accordance with Figure 6 BS8576:2013, an appropriate minimum monitoring regime is six readings over two months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2015 +A1:2019 and CL: AIRE TB17 advocate that monitoring should include a period of rapidly falling atmospheric pressure).

Hydrock has undertaken six readings. As shown in Figure *7.1* visits completed on the 19th and 30th of September and 8th of October were during falling atmospheric pressure, with rapidly atmospheric pressure during the two visits in September. Therefore, its considered that worst case atmospheric conditions in accordance with BS 8485:2015 +A1:2019 and CL: AIRE TB17have been monitored.

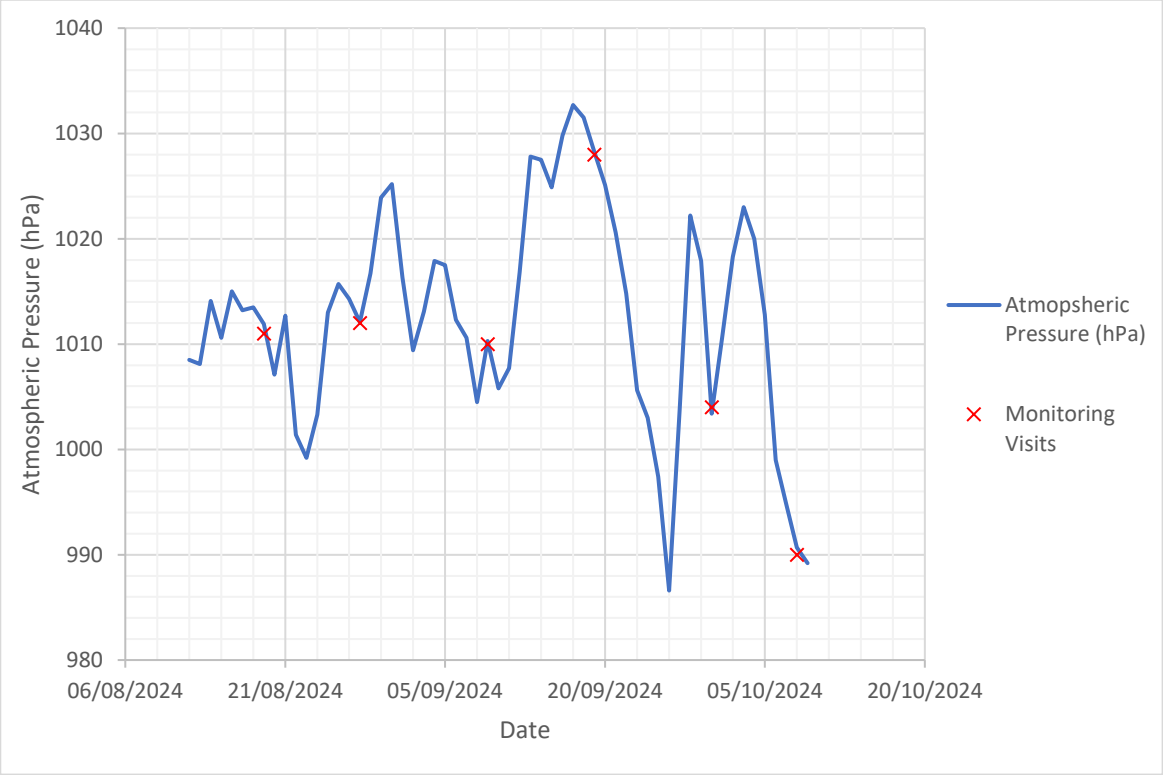

Figure 7.1: Atmospheric pressure over the monitoring period

7.7.3 *Assessment results*

The assessment is summarised in Table 7.2 and the full assessment is presented in Appendix D.

Table 7.2: Ground gas risk assessment

	Min	Max	Typical [i]	Comment
Steady Flow Rate (l/hr)	0.1	1.0	<0.1	-
Methane (%)	<0.1	0.2	<0.1	-
Carbon Dioxide (%)	<0.1	2.7	<5	-
Carbon Monoxide (ppm)	<1	<1	<1	-
Hydrogen Sulphide (ppm)	<1	<1	<1	-
Oxygen (%)	18.2	20.7	>16	-
Carbon Dioxide GSV (l/hr)	<LOD	0.02	<0.07	CS1
Methane GSV (l/hr)	<LOD	0.001	<0.07	CS1

[i] Hydrock assumes that values are considered to be atypical if 95% or more of the remaining data are less than the value under consideration.

For the purposes of the calculation, where the recorded gas flow rate is below the manufacturer's limit of detection for the instrument used, the detection limit has been adopted for the gas flow rate.

Based on the Hydrock data, the ground gas regime for the site is classed as Characteristic Situation (CS) 1. CS1 is the lowest risk and no ground gas protection measures are required under this situation.

7.8 Phytotoxicity risk assessment

Results indicate that all CoPC are below the relevant phytotoxic GAC, therefore the contaminant linkage is incomplete.

Notwithstanding the concentrations of contamination identified, there is no shallow subsoil or topsoil growing medium on the site and this will require import to support the planned provision of landscaped areas and/or residential gardens.

Cover system depths within soft landscaping will be dependent on proposed planting and will be required to align with Manchester Council Planning guidance shown in Figure 7.2

Table 1 Growth medium rooting depths for various vegetation types

Vegetation Type	Rooting Depth (mm)
Grass	450
Plants	450
Shrubs	600
Trees	900

Figure 7.2: Manchester Council extract for rooting depths based on vegetation type

7.9 Construction materials risk assessment

7.9.1 Water Pipelines

The site is brownfield. However, the investigation has not detected organic contamination in exceedance of the threshold values and Hydrock believes standard pipework may be suitable for the site. However, confirmation should be sought from the water supply company at the earliest opportunity.

7.9.2 Other construction materials

Plastic pipes for drains and sewers are manufactured from unplasticized poly (vinyl chloride) (PVC-U), polypropylene (PP) or polyethylene (PE). These materials may be affected by the presence of organic compounds in the soil.

In accordance with the British Plastics Federation Guidance (August, 2018), as the concentrations of PAH, and BTEX are below 100mg/kg and the concentrations of petroleum hydrocarbons (TPH) are below 200 mg/kg, PVC-U, PP or PE pipework is considered suitable.

7.9.3 Ground gas

The contractors should utilise the necessary health and safety precautions when working in trenches or confined spaces, where soil gas concentrations are not necessarily reflected by those in the breathing zone.

7.9.4 Asbestos

As no clearly identifiable ACM has been seen during the site walkover or during the ground investigation and no fibres have been detected in soil samples analysed by laboratory testing. However, there is always the possibility of unexpected contamination and the Contractors should undertake a watching brief during the works. If any suspect material is encountered, works in that area of the site should stop, the area fenced off and Hydrock should be notified.

7.10 Updated Conceptual Site Model

Any asbestos containing materials within the existing building should be removed or managed under controlled conditions by an asbestos specialist, reducing the risk of exposure to low, the final conceptual site model is present in Appendix H.

Any imported Topsoil or Subsoil should be sourced from a Greenfield source. At least three chemical sample should be completed per source and chemical concentrations should not exceed residential with plant uptake reuse criteria. Upon import, testing and installation of the growing medium a letter should be compiled confirming the soils are suitable for use and issued to the local authority for approval.

8. Waste and materials management

8.1 Introduction

The Waste Framework Directive (WFD) (2009/98/EC) defines waste as '*any substance which the holder discards or intends to discard.*' In a geo-environmental context, the waste is most often 'soil' and the two main scenarios are offsite disposal of the material as a waste and/or reuse of the material on site. For cost and sustainability reasons, reuse is preferred to off-site disposal.

Section 8.2 below describes the key issues relating to off-site disposal to landfill.

8.2 Waste disposal

8.2.1 Principles

Based on the WFD, any material excavated on site may be classified as waste and it is the responsibility of the producer of a material to determine whether or not it is waste. Where off-site disposal is undertaken, the following guidance applies.

Classification is a staged process:

- A hazardous waste is defined under the WFD as one which possesses one or more of fifteen defined hazardous properties. If a waste is not defined as hazardous, then it is non-hazardous.
- Where the materials are soil, it is then be assigned using the 'List of Waste Codes', which classifies the material as either:
  - hazardous (17-05-03), which is defined as "*soil and stones containing hazardous substances*"; or
  - non-hazardous (17-05-04), which is defined as "*soil and stones other than those mentioned in 17-05-03*".
  - Hydrock utilise the proprietary assessment tool, HazWasteOnline™ to undertake this assessment.
- Waste Acceptance Criteria (WAC) testing is then undertaken (if required), and are only applicable following classification of the waste, and only where the waste is destined for disposal to landfill. The WAC are both qualitative and quantitative. The WAC and the associated laboratory analyses (leaching tests) are not suitable for use in the determination of whether a waste is hazardous or non-hazardous.

It should be noted that some non-hazardous wastes may be suitable for disposal at an inert landfill as non-hazardous waste, subject to meeting the appropriate waste acceptance criteria.

It should be noted that classification must be undertaken on the waste produced, by the waste producer. Necessary sampling frequency to adequately characterise a soil population is defined within WM3.

Contaminated or potentially contaminated sites

If the site is brownfield, contaminated or potentially contaminated, the waste must undergo an initial waste classification exercise using background information on the source and origin of the waste and assessment of chemical test data in accordance with Environment Agency Technical Guidance WM3.

If following the initial waste classification exercise, the soils are acceptable for disposal to a non-hazardous landfill, further qualitative Waste Acceptance Criteria (WAC) testing is not required.

However, if soils are potentially able to be disposed to an inert landfill as non-hazardous waste, or require testing to determine if they can be disposed of to a stable non-reactive hazardous or

hazardous class of landfill, the next stage of assessment is to undertake qualitative WAC testing. This will determine the Basic Characterisation and the landfill category at which the soils can be accepted.

Hazardous material must be subjected to WAC testing to determine whether it requires treatment before it can be accepted at the hazardous landfill, while non-hazardous material can be tested to determine whether it may be suitable for placement in an inert landfill.

8.2.2 HazWasteOnline™ assessment

As the site is brownfield, in order to inform the preliminary waste characterisation process, Hydrock has undertaken an exercise using the proprietary web-based tool HazWasteOnline™. The output of the HazWasteOnline™ assessment is provided in Appendix F and a summary of the preliminary waste classification is provided below in Section 8.2.3.

8.2.3 Preliminary waste disposal options

The site is brownfield and based on the site history, the HazWasteOnline™ assessment, if suitable segregation of different types of waste is put in place, for soils to be disposed of, it is considered that:

- Made Ground is likely to be classified as non-hazardous waste.
- Loss on ignition testing completed on samples of the Made Ground were in the order of 1.4 to 9.7%, below the threshold for disposal to a hazardous landfill.
- The total organic carbon content in the Made Ground was 0.5 to 2.3% and in the Glaciofluvial Sheet Deposits was 0.24% which are below the thresholds for disposal to a hazardous landfill.
- The natural soils are likely to be classified as non-hazardous waste, however WAC testing will be required should it be required to dispose of the natural soils to an inert landfill.

8.2.4 General waste comments

It should be noted that:

- Any soils containing > 0.1% asbestos or visible asbestos containing materials would be considered as hazardous.
- It is the waste producer's responsibility to segregate the waste at source and waste producers must not mix waste materials/streams or dilute hazardous components, for example by mixing with less or non-hazardous waste on site to meet WAC limit values.
- The above preliminary assessment has been made on the basis of the soils tested as part of the ground investigation, using the HazWasteOnline™ assessment. However, the formal classification of waste can only be undertaken on the material to be disposed of, and by the waste producer and the receiving landfill as license conditions vary from landfill to landfill.
- Basic Characterisation should be undertaken in accordance with Environment Agency guidance by the waste producer. Hydrock can assist if required and this report will assist the characterisation. However, Basic Characterisation does not form part of the current commission and would require further assessment and testing on the wastes actually to be disposed.
- Once the waste producer has undertaken an initial Basic Characterisation on each waste stream, they can manage the soils as part of the on-site processing programme (for example, stockpiling, treatment, screening and separation). The waste producer and landfill operator will then need to agree the suite of compliance testing for regularly generated waste to demonstrate compliance with the initial Basic Characterisation prior to disposal.
- At the time of disposal, additional testing on the excavated soils to be disposed of, will likely be necessary.

- Non-hazardous and hazardous soils require pre-treatment (separation, sorting and screening) prior to disposal.
- The costs for disposal of non-hazardous and hazardous soils are significant compared to disposal of inert material.
- In addition to disposal costs, landfill tax will be applicable. Non-hazardous and hazardous waste will generally be subject to the Standard Rate Landfill Tax. Inert or inactive waste will generally be subject to the Lower Rate Landfill Tax. The landfill tax value changes each April and can be found at https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013.
- Before a waste producer can move waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following[2]:
  - Duty of care transfer note / Hazardous Waste consignment note, including comment as to if pre-treatment has been undertaken; and
  - Basic Characterisation of the waste, to include: description of the waste; waste code (using list of wastes); composition of the waste (by testing, if necessary) and; WAC testing (if required).

[2] ENVIRONMENT AGENCY. November 2010. Guidance on waste acceptance procedures and criteria. Waste acceptance at landfills. The Environment Agency.

9. Uncertainties and limitations

9.1 Site-specific comments

Hydrock were unable to complete a borehole directly adjacent to the proposed extension due to concerns regarding unrecorded services entering the basement.

In the east of the site Hydrock were unable to penetrate below the subsurface concrete slab associated with the backfilled basements.

9.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of Vision Developments (the Client), by e-mail dated 4th June 2024 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in July and August 2024. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

Hydrock has used reasonable skill, care, and diligence in the design of the investigation of the site and in its interpretation of the information obtained. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Groundwater data are only representative of the dates on which they were obtained and both levels and quality may vary.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness.

Where the existing report(s) prepared by others have been provided by the Client, it is assumed that these have been either commissioned by the Client, or can be assigned to the Client, and can be relied upon by Hydrock. Should this not be the case Hydrock should be informed immediately as additional work may be required. Hydrock is not responsible for any factual errors or omissions in the supplied data, or for the opinions and recommendations of others. It is possible that the conditions described may have since changed through natural processes or later activities.

The work has been carried out in general accordance with recognised best practice. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The work has not been undertaken to meet the requirements of the Geotechnical Design Report (GDR) in accordance with BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design — Part I). The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

The chemical analyses reported were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional analysis will be required at the time of disposal to fully classify waste. Discussion and comment with regards to waste classification are preliminary and do not form the requirements of 'Basic Characterisation' as required.

Assessment and testing for the presence of coal tar has only been completed at the locations of exploratory holes undertaken for risk assessment purposes. This investigation is not designed to provide a definitive assessment of the risk from coal tar, nor the waste classification for bituminous bound pavement arisings at the site.

Unless otherwise stated, at the time of this investigation the future routes of water supply pipes had not been established. This investigation and sampling strategy may not be fully compliant with UKWIR recommendations. Consequently, a targeted investigation and specific sampling and chemical testing may be required at a later date once the routes of the supply pipes are known. In addition, it is recommended that the relevant water supply company be contacted at an early stage to confirm its requirements for assessment, which may not necessarily be the same as those recommended by UKWIR.

Whilst the preliminary risk assessment process has identified potential risks to construction workers, consideration of occupational health and safety issues is beyond the scope of this report.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds, this report does not constitute a formal survey of these potential constraints and specialist advice should be sought.

Any site boundary line depicted on plans does not imply legal ownership of land.

10. Recommendations for further work

Following the ground investigation works undertaken to date, the following further works will be required:

- completion of an asbestos refurbishment survey and removal or management of any identified asbestos containing materials by an asbestos removal specialist prior to refurbishment;
- a PAS 128 utility survey should be undertaken in particularly adjacent to the existing 8-8a St John Street to establish the locations unrecorded service entering the basement;
- once the utility survey is completed additional ground investigation will be required adjacent to 8-8a St John Street, likely utilising a cut down cable percussive rig to obtain geotechnical parameters for the design of foundations for the proposed extension;
- following removal of the brick planters across the site, trial pitting is recommended at the location of extension in the south to confirm the feasibility of trench fill foundations;
- trial pitting at the location of proposed building in the north is also recommended to prove the depth to the Glaciofluvial Sheet Deposits below the backfilled basement bases;
- there is potential for discussion with a piling contractors if trench fill foundations are not feasible for the proposed extension, should trench collapse limit excavation depths;
- discussion and agreement with utility providers regarding the materials suitable for pipework;
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report;
- discussion with a structural engineer regarding the design of the trench fill foundation if greater than 2.5m bgl;
- provision of geotechnical design for the Category 2 structures (foundations); and
- testing of any imported Topsoil and Subsoil, validation of growing medium depths, submission of a letter report to the local authority for acceptance.

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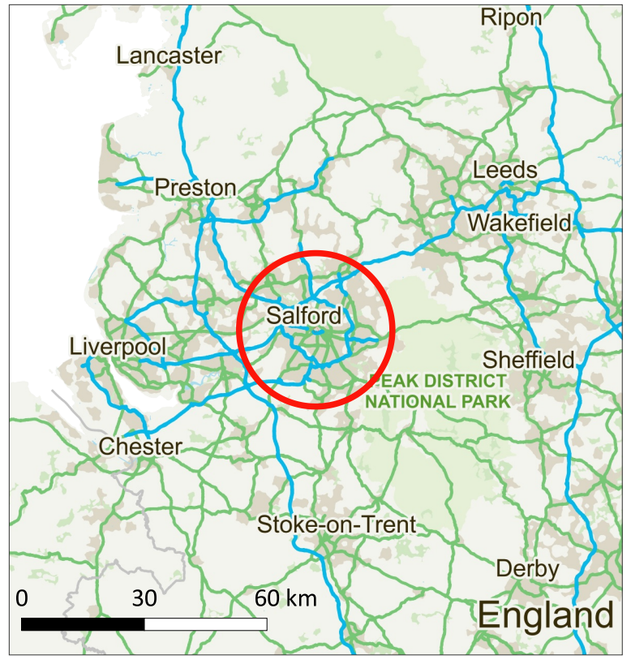
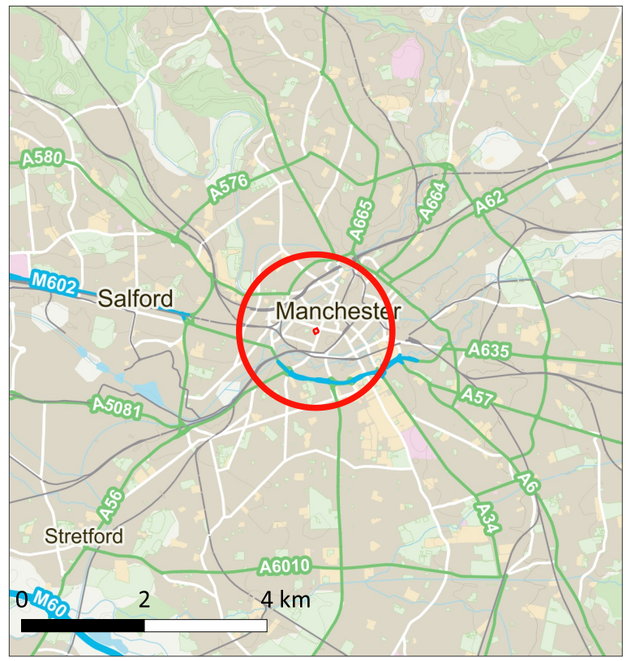
Appendix A Drawings





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KEY PLAN

Site Boundary

NOTES

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REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	RS	AC	10/07/24	First issue

Hydrock

TITLE
SITE LOCATION PLAN

HYDROCK PROJECT NO.
16488

SCALE @ A3
1:600

CLIENT
Vision Developments

PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
8-8a St John Street

DRAWING NO.
16488-HYD-XX-XX-RP-GE-0001

REVISION
P01

KEY PLAN

Site Boundary [1]

Current Site Features (Points)

- Block Paving
- Access to rear of site
- Stairs down to basement

Current Site Features (Polygons)

- Three storey building with basement
- Raised planters with mature trees
- Block paving

NOTES

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REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	RS	AC	10/07/24	First issue

Hydrock

TITLE
Site Features Plan

HYDROCK PROJECT NO.
16488

SCALE @ A3
1:400

CLIENT
Vision Developments

PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
8-8a St John Street

DRAWING NO.
16488-HYD-XX-XX-DR-GE-0002

REVISION
P01

KEY PLAN

Site Boundary

Proposed Locations

Window Sampling

Installation

Current Site Features (Polygons)

At 2.3m bgl layer associated with construction of adjacent basement.

At 1.5m bgl concrete slab associated with base of backfilled basement.

NOTES

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REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	RS	AC	07/10/24	First issue

Hydrock

TITLE
Obstructions Plan

HYDROCK PROJECT NO.
16488

SCALE @ A3
1:200

CLIENT
Vision Developments

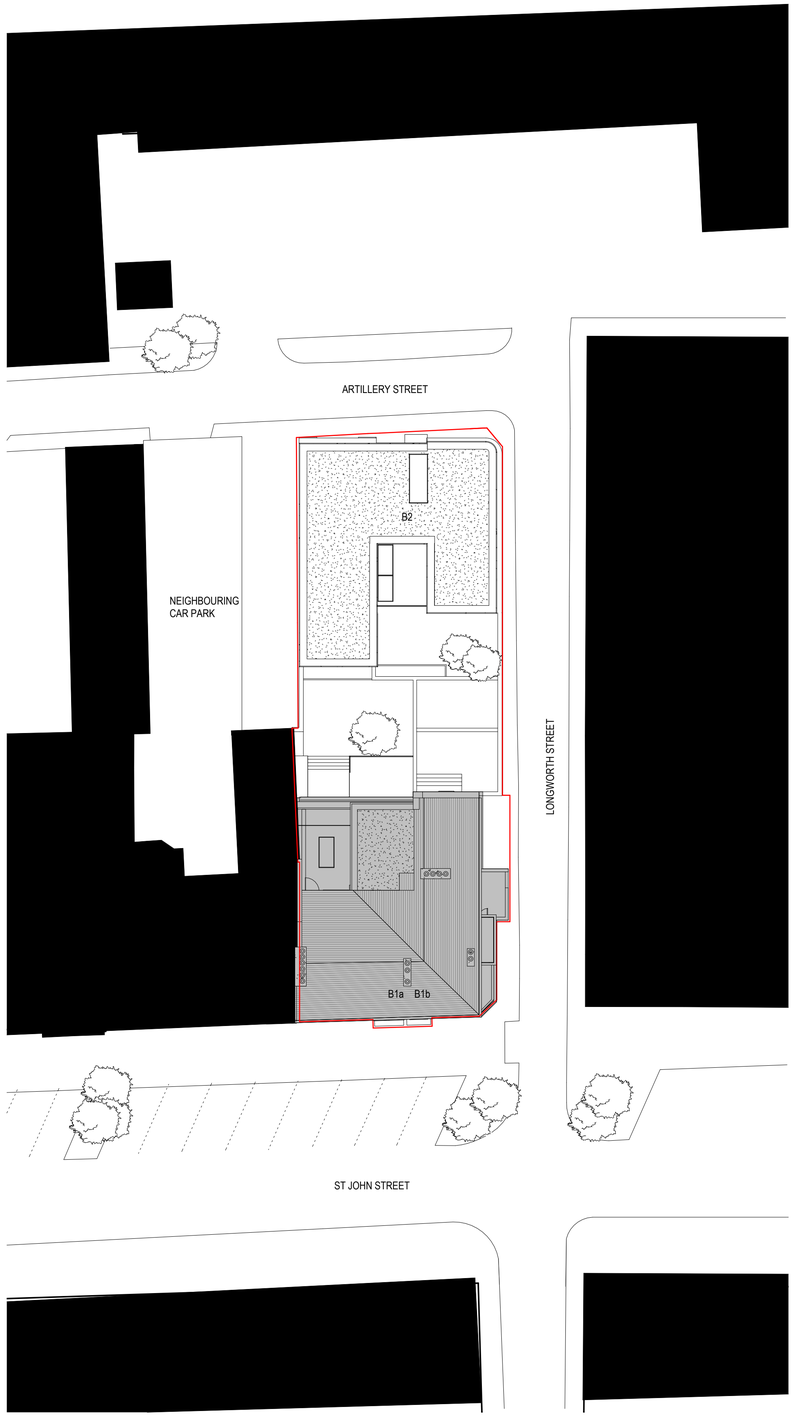
PURPOSE OF ISSUE
SUITABLE FOR INFORMATION

STATUS
S2

PROJECT
8-8a St John Street

DRAWING NO.
16488-HYD-XX-XX-DR-GE-0005

REVISION
P01



1 | Proposed Site Plan
1 : 200

N

0m 10m 20m

General Notes

Use figured dimensions only. Do not scale off this drawing. All dimensions must be set out and checked by the contractor on site prior to commencement of construction. Any variations between drawings and site must be reported to TGA before work proceeds.

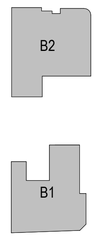
Drawings to be read in conjunction with Architectural Specification, Structural Engineer's Drawings and Specifications, Mechanical & Electrical Engineer's Drawings and Specifications, all Supplemental Information, including but not limited to; Detailed Fire Strategy, Acoustic Report, Thermal Report & Overheating Report.

No portion of the Works to commence without acceptance of the required submittals by the Employer.

Main Contractor to submit relevant documents to building regulation and legislation approval authorities as required to comply with the Specification.

Red Line Boundary

Key Plan



Rev	Description	Date	By
P01	Draft Planning Issue	12.11.24	SD
P02	Draft issue to Design Team	13.12.24	SD
P03	Issue to Design Team	06.01.25	SD

Title
Proposed Site Plan

Drawing No.
1084-TGA-ZZ-ZZ-DR-A-95201

Revision
P03

Status
Planning

Scale
As indicated@A1

Project
St John Street

Client
Mr. Ford

TIM GROOM ARCHITECTS

Eastgate, 2 Castle Street, Manchester, M3 4LZ 0161 870 1152

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Appendix B Exploratory hole location plan, exploratory hole logs and photographs

Exploratory hole location plan

ID	Type	X (Easting)	Y (Northing)	Installation
WS01	WS	383461.98	397933.37	Y
WS02	WS	383465.95	397948.54	Y
WS03	WS	383473.96	397948.21	Y
WS04	WS	383471.93	397941.42	N

KEY PLAN

Site Boundary

Proposed Locations

Window Sampling

Installation

NOTES

1. Contains OS data © Crown copyright and database right (2022)

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	RS	AC	07/10/24	First issue

Hydrock

TITLE PROPOSED GROUND INVESTIGATION PLAN

HYDROCK PROJECT NO. 16488

SCALE @ A3 1:250

CLIENT Vision Developments

PURPOSE OF ISSUE SUITABLE FOR INFORMATION

STATUS S2

PROJECT 8-8a St John Street

DRAWING NO. 16488-HYD-XX-XX-DR-GE-0004

REVISION P01

Exploratory hole logs

Hydrock now Stantec

Project: 8-8a St John Street

Borehole No
WS01
Page No. 1 of 1

Method: Dynamic (Windowless) Sampler	Date(s): 30/07/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Vision Developments	Co-ords: 383461.98, 397933.09	Checked By: RS	Rig: Dart
Hydrock Project No: 16488	Ground Level: 34.80m OD		Scale: 1:30

Sample Run Info			Testing			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Sample Run	Run Ø	Recovery	Depth (m)	Type	Results							
			0.50 0.50 - 1.00	ES D			ASPHALT HARDSTANDING. (HARDSTANDING) Loose dark blackish grey sandy slightly ashy GRAVEL with a high cobble content of angular brick and rare fragments of ceramic pottery. Gravel is angular to subangular, fine to coarse of limestone, coal, concrete, brick and slate. (MADE GROUND)	0.10	(0.10)	34.70		
1.20 - 2.00		63%	1.20	SPT	N=4 (1,1,1,1,1,1)				(2.20)			
2.00 - 2.30		100%	2.00	SPT	N=19 (6,6,5,5,5,4)							
			2.30	SPT	50/0mm ()		End of Borehole at 2.30m	2.30		32.50		

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using dynamic windowless sampling. 4) Hole terminated at 2.30m bgl due to a suspected compacted blinding layer associated with the adjacent basement foundation construciton. 5) Response zone between 0.50m and 2.30m bgl. 6) No groundwater encountered.

Groundwater: No groundwater encountered.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: 8-8a St John Street

Borehole No
WS02
Page No. 1 of 1

Method: Dynamic (Windowless) Sampler	Date(s): 30/07/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Vision Developments	Co-ords: 383465.88, 397948.95	Checked By: RS	Rig: Dart
Hydrock Project No: 16488	Ground Level: 34.11m OD		Scale: 1:30

Sample Run Info			Testing			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Sample Run	Run Ø	Recovery	Depth (m)	Type	Results							
							CONCRETE FLAGSTONE. (HARDSTANDING)	0.10	(0.10)	34.01		
			0.20	ES			Dark grey sandy ashy GRAVEL with a high cobble content of angular brick. Gravel is is angular to subangular, fine to coarse of limestone, brick, concrete and slag. (MADE GROUND)	0.60	(0.50)	33.51		
			0.80 0.80	D ES			Firm medium strength dark brown very sandy gravelly CLAY with a medium cobble content of subangular brick. Gravel is angular to subangular, fine to coarse of sandstone, brick and concrete. (MADE GROUND)	1.80	(1.20)	32.31		
1.20 - 2.00		100%	1.20	SPT	N=12 (1,1,2,2,3,5)							
			1.90 - 2.00	ES			Medium dense orangish brown sandy GRAVEL. Gravel is subangular to rounded, fine to coarse of sandstone, mudstone and quartz. (GLACIOFLUVIAL SHEET DEPOSITS)	2.50	(0.70)	31.61		
2.00 - 3.00		100%	2.00	SPT	N=27 (5,9,9,6,6,6)							
			2.50 - 3.50	B			Weathered Sandstone Bedrock; recovered as: Medium dense becoming dense reddish brown slightly gravelly slightly clayey SAND. Gravel is subrounded to rounded, fine of sandstone and mudstone. (WEATHERED CHESTER FORMATION)	3.70	(1.20)	30.41		
			2.50 - 3.50	D								
3.00 - 3.70		71%	3.00	SPT	N=22 (4,4,5,5,6,6)							
			3.70	SPT	N=47 (6,7,8,10,11,18)		End of Borehole at 3.70m					

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using dynamic windowless sampling. 4) Hole terminated at 3.70m bgl due to refusal on Sandstone Bedrock. 5) Response zone between 2.00m and 3.50m bgl. 6) No groundwater encountered.

Groundwater: No groundwater encountered.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: 8-8a St John Street	Borehole No WS03 Page No. 1 of 1

Method: Dynamic (Windowless) Sampler	Date(s): 30/07/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Vision Developments	Co-ords: 383473.97, 397948.38	Checked By: RS	Rig: Dart
Hydrock Project No: 16488	Ground Level: 33.97m OD		Scale: 1:30

Sample Run Info			Testing			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Sample Run	Run Ø	Recovery	Depth (m)	Type	Results							
							CONCRETE FLAGSTONE. (HARDSTANDING)	0.10	(0.10)	33.87		
							Very dark greyish brown sandy ashy GRAVEL. Gravel is angular to subangular, fine to coarse of siltstone, brick and concrete. (MADE GROUND)	0.20	(0.10)	33.77		
			0.30	D								
			0.30 - 0.60	B			Medium dense dark greyish brown sandy slightly clayey GRAVEL with a high cobble content of angular brick and concrete and rare fragments of ceramic pottery. Gravel is angular to subangular, fine to coarse of limestone, brick, concrete and coal. (MADE GROUND)		(1.30)			
			1.00	ES				1				
1.20 - 1.30		100%	1.20	SPT	N=14 (1,1,5,2,2,5)							
			1.50	SPT	50/0mm ()			1.50		32.47		
							End of Borehole at 1.50m					
								2				
								3				
								4				
								5				
								6				

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using dynamic windowless sampling. 4) Hole terminated at 1.30m bgl due to subsurface concrete slab associated with former basement. 5) No groundwater encountered.

Groundwater: No groundwater encountered.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: 8-8a St John Street

Borehole No
WS04
Page No. 1 of 1

Method: Dynamic (Windowless) Sampler	Date(s): 30/07/2024	Logged By: JH	Drilled By: DMW Drilling
Client: Vision Developments	Co-ords: 383471.96, 397941.52	Checked By: RS	Rig: Dart
Hydrock Project No: 16488	Ground Level: 34.04m OD		Scale: 1:30

Sample Run Info			Testing			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
Sample Run	Run Ø	Recovery	Depth (m)	Type	Results							
							CONCRETE FLAGSTONE. (HARDSTANDING)	0.10	(0.10)	33.94		
							Very dark grey sandy ashy GRAVEL with a medium cobble content of subangular brick. Gravel is angular to subangular, fine to coarse of tarmac, limestone and brick. (MADE GROUND)	0.30	(0.20)	33.74		
			0.50	D			Very loose light greyish brown very sandy GRAVEL with a medium cobble content of angular brick. Gravel is angular to subangular, fine to coarse of sandstone, brick, concrete and slate. (MADE GROUND)					
			0.50	ES								
			0.50 - 1.00	B								
			0.50 - 1.00	ES					(1.20)			
1.20 - 1.50		100%	1.20	SPT	N=0 (1,0,0,0,0,0)							
			1.50	SPT	50/0mm ()		End of Borehole at 1.50m	1.50		32.54		

General Remarks:
1) Location cleared for services. 2) Hand dug inspection pit completed to 1.20m bgl. 3) Hole progressed using dynamic windowless sampling. 4) Hole terminated at 1.50m bgl due to subsurface concrete slab associated with former basement. 5) No groundwater encountered.

Groundwater: No groundwater encountered.

Logged in general accordance with BS5930:2015

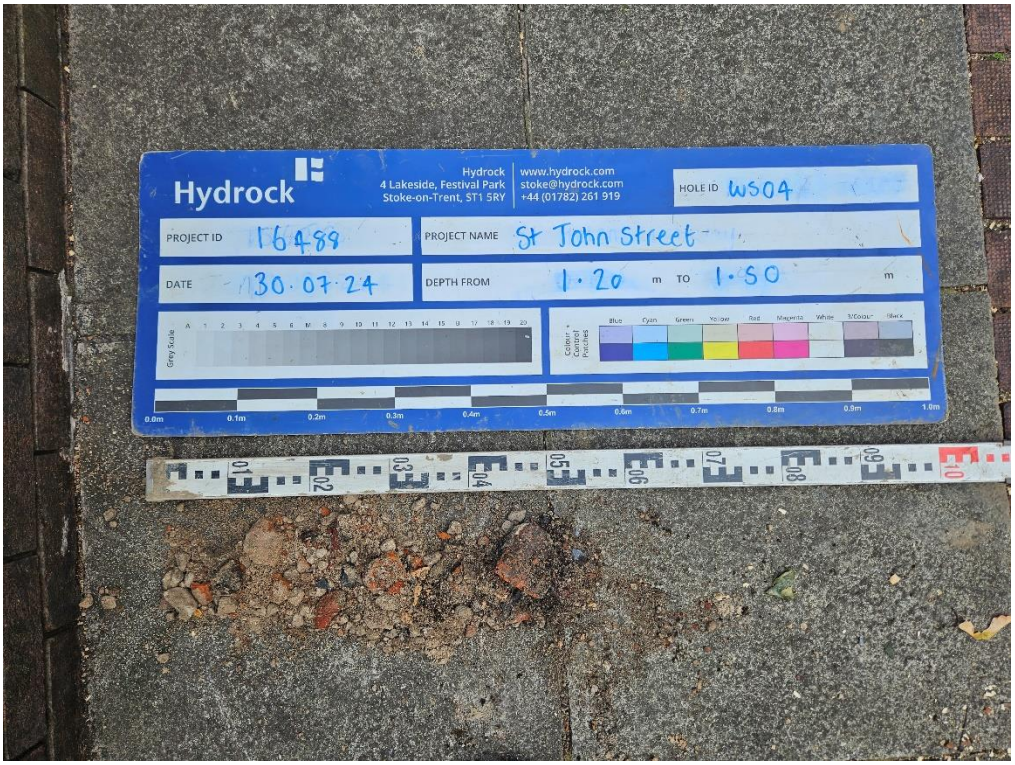
Exploratory hole photographs

Site Investigation Photograph 1

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS04 1.2m to 1.5m bgl

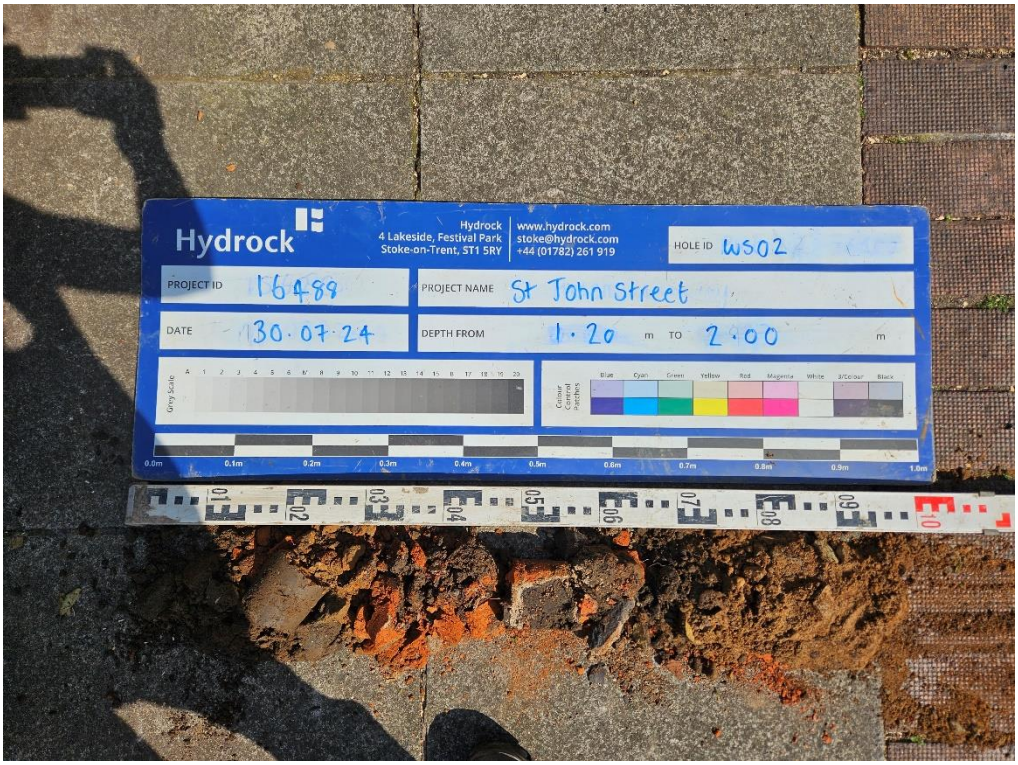


Site Investigation Photograph 2

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS02 1.2m to 2.0m bgl



Site Investigation Photograph 3

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS02 2.0 to 3.0m bgl.

Site Investigation Photograph 4

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS02 3.0 to 3.70m bgl.

Site Investigation Photograph 5

Date: 30/07/24

Direction Photograph Taken: N/A

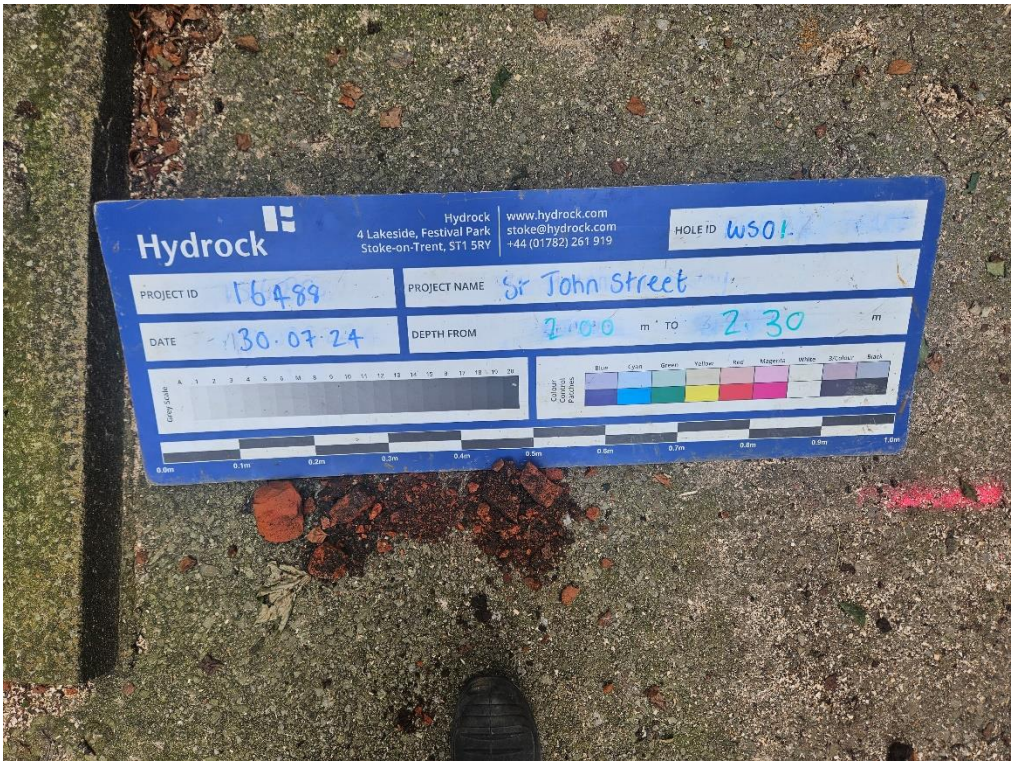
Description: WS01 1.2m to 2.0m bgl

Site Investigation Photograph 6

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS01 2.0m to 2.3m bgl



Site Investigation Photograph 7

Date: 30/07/24

Direction Photograph Taken: N/A

Description: WS03 1.2 to 1.5m bgl.

Site Investigation Photograph 8

Date: 30/07/24

Direction Photograph Taken: Facing west

Description: Restricted access to the area adjacent to 8-8a St John Street

Site Investigation Photograph 9

Date: 30/07/24

Direction Photograph Taken: N/A

Description: Facing the rear of 8-8a St John Street

Site Investigation Photograph 10

Date: 30/07/24

Direction Photograph Taken: Facing north

Description: Stair down to basement approximately 1.70m below street level.

Appendix C Geotechnical test results and geotechnical plots

Geotechnical laboratory test results

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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

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

4041

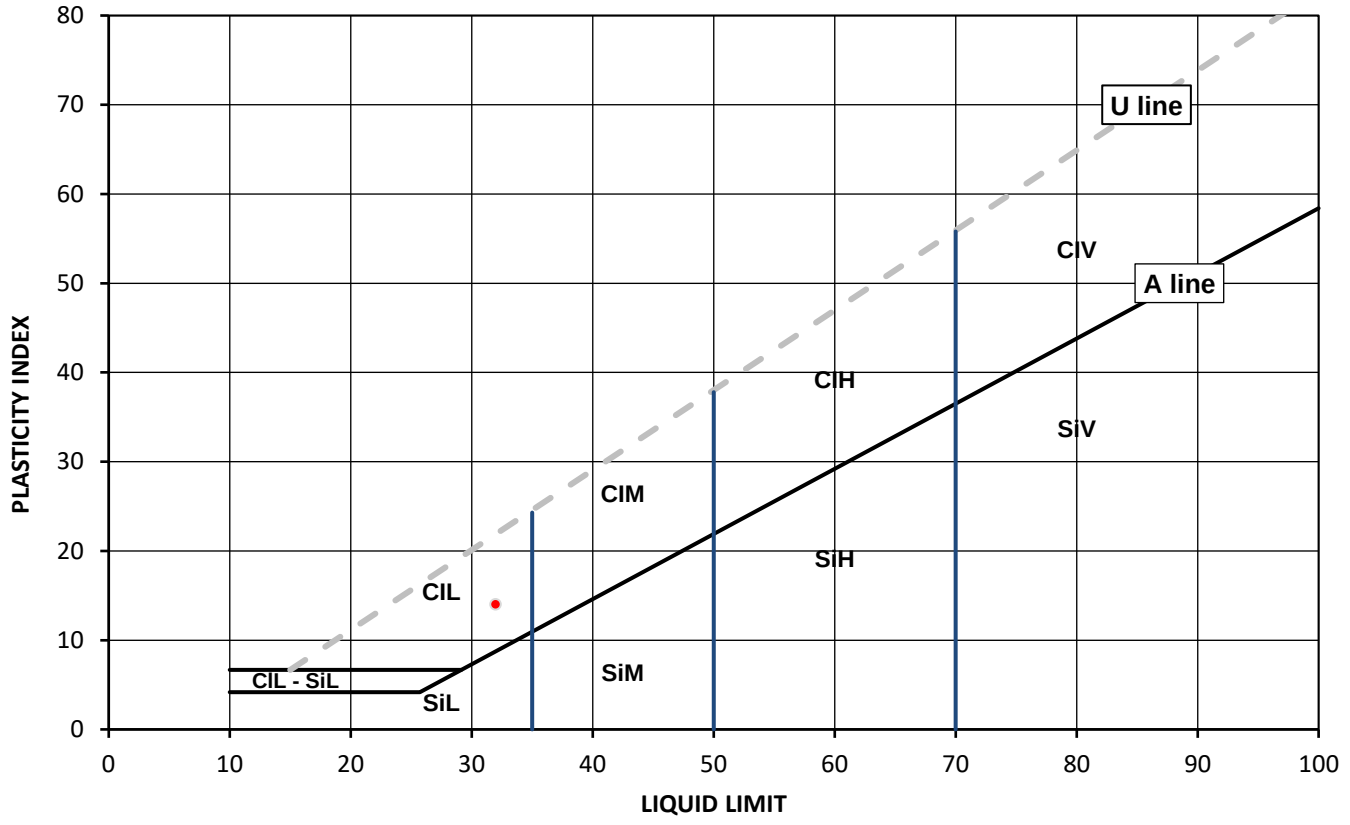
Client:	Hydrock Consultants Ltd	Client Reference:	16488
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-034447-1
		Date Sampled:	30/07/2024
		Date Received:	01/08/2024
Contact:	Juliette Hurst	Date Tested:	08/08/2024
Site Address:	St John Street	Sampled By:	Client - JH

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

Test Results:

Laboratory Reference:	277353	Depth Top [m]:	0.80
Hole No.:	WS02	Depth Base [m]:	Not Given
Sample Reference:	D1	Sample Type:	D
Sample Description:	Brown gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >0.425mm; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
14.1	32	18	14	-0.29	1.29	55



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

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

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks:

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

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/08/2024

GF 337.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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

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

4041

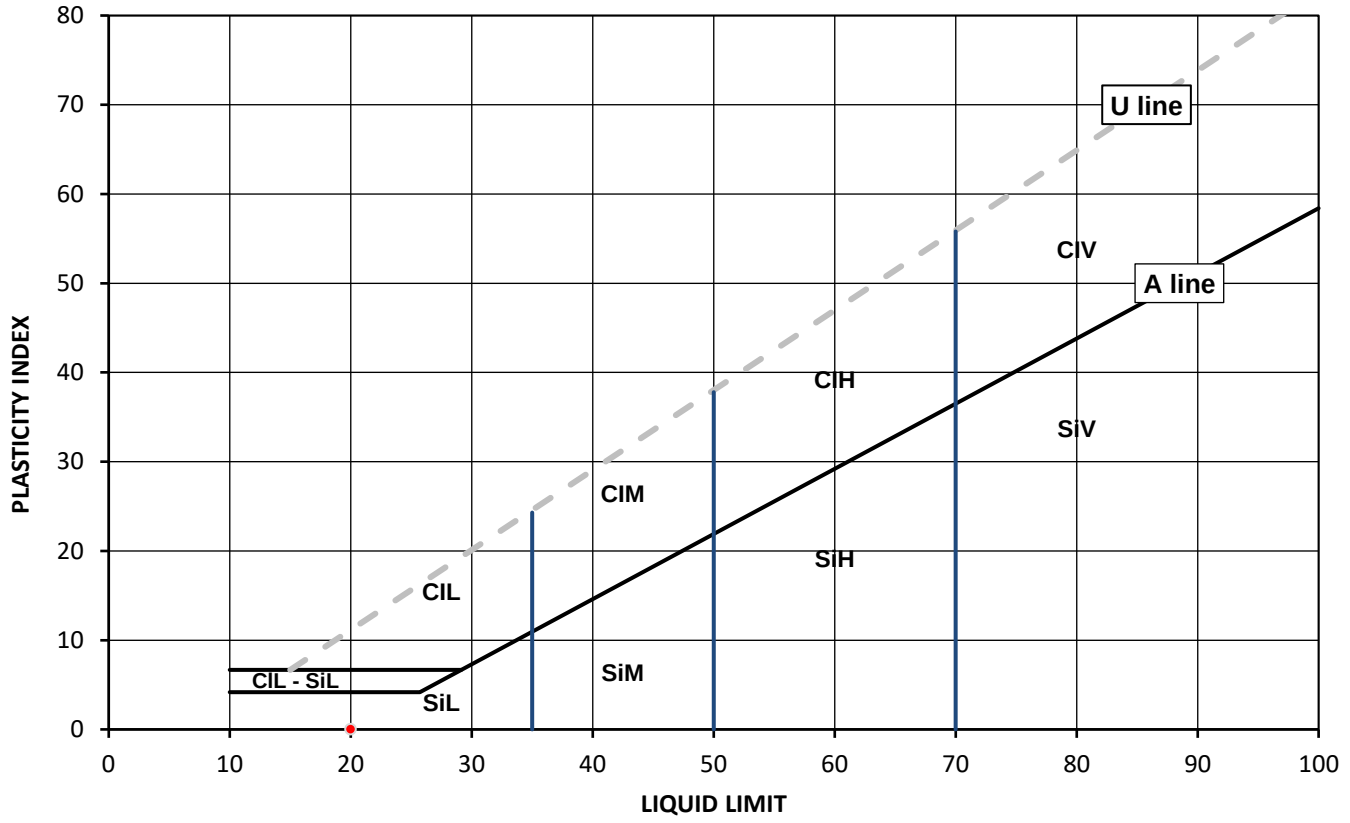
Client:	Hydrock Consultants Ltd	Client Reference:	16488
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-034447-1
		Date Sampled:	30/07/2024
		Date Received:	01/08/2024
Contact:	Juliette Hurst	Date Tested:	08/08/2024
Site Address:	St John Street	Sampled By:	Client - JH

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

Test Results:

Laboratory Reference:	277355	Depth Top [m]:	2.50
Hole No.:	WS02	Depth Base [m]:	3.50
Sample Reference:	D3	Sample Type:	D
Sample Description:	Reddish brown slightly gravelly slightly clayey SAND		
Sample Preparation:	Tested after >0.425mm removed by hand; The water content in the sample was increased		
Cone Type:	80g/30deg		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	Liquidity Index [IL] % #	Consistency Index [IC] % #	% Passing 425µm BS Test Sieve
8.3	20	NP	NP	N/A	N/A	97



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

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

Note: Water Content by BS EN 17892-1: 2014; # Non accredited

Remarks: NP - non plastic.

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

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/08/2024

GF 337.13

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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

4041

Client: Hydrock Consultants Ltd

Client Address: 4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY

Contact: Juliette Hurst

Site Address: St John Street

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

Client Reference: 16488
Job Number: 24-034447-1
Date Sampled: 30/07/2024
Date Received: 01/08/2024
Date Tested: 08/08/2024
Sampled By: Client - JH

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	W	Liquid & Plastic Limit							Density		
		Reference	Depth Top m	Depth Base m	Type			%	% Passing 425um %	WL* %	Correlation Factor	Wp %	Ip %	Cone type	Sample Preparation	bulk Mg/m3	dry Mg/m3	PD Mg/m3
277353	WS02	D1	0.80	Not Given	D	Brown gravelly very sandy CLAY	Atterberg 4 Point	14.1	55	32	-	18	14	80g/30 deg	W / I			
277355	WS02	D3	2.50	3.50	D	Reddish brown slightly gravelly slightly clayey SAND	Atterberg 4 Point	8.3	97	20	-	NP	NP	80g/30 deg	R / I			
277356	WS03	B2	0.30	0.60	B	Greyish Brown slightly gravelly SAND		17.8										

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

Comments:

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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

Date Reported: 16/08/2024 **GF 362.15**

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

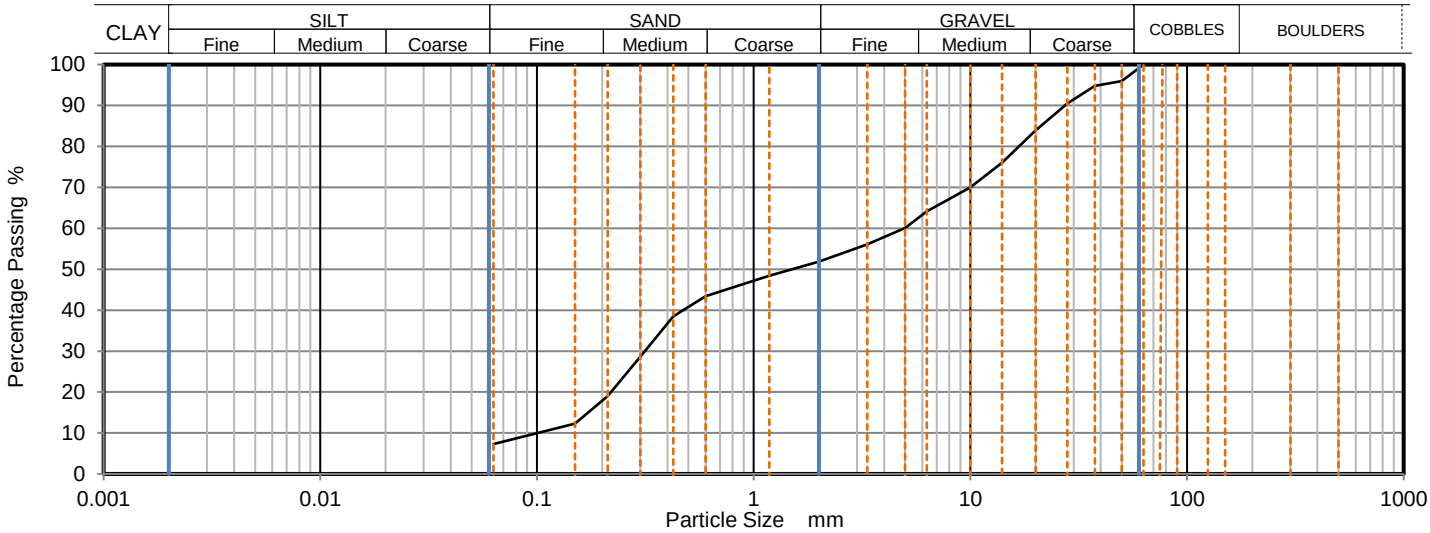
4041

Client:	Hydrock Consultants Ltd	Client Reference:	16488
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-034447-1
		Date Sampled:	30/07/2024
		Date Received:	01/08/2024
Contact:	Juliette Hurst	Date Tested:	09/08/2024
Site Address:	St John Street	Sampled By:	Client - JH

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

Test Results:

Laboratory Reference:	277352	Depth Top [m]:	0.50
Hole No.:	WS04	Depth Base [m]:	1.00
Sample Reference:	B2	Sample Type:	B
Sample Description:	Brownish grey very sandy clayey GRAVEL		
Sample Preparation:	Sample was quartered, oven dried at 108.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	95		
28	91		
20	84		
14	76		
10	70		
6.3	64		
5	60		
3.35	56		
2	52		
1.18	48		
0.6	43		
0.425	39		
0.3	29		
0.212	19		
0.15	12		
0.063	7		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	48.00
Sand	45.00
Fines <0.063 mm	7.00

Grading Analysis		
D100	mm	63
D60	mm	4.94
D30	mm	0.315
D10	mm	0.101
Uniformity Coefficient		49
Curvature Coefficient		0.2

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

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

Remarks:

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

Signed: Monika Siewior

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/08/2024

GF 366.11

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS EN ISO 17892-4:2016, BS 1377-2:2022 cl. 10

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

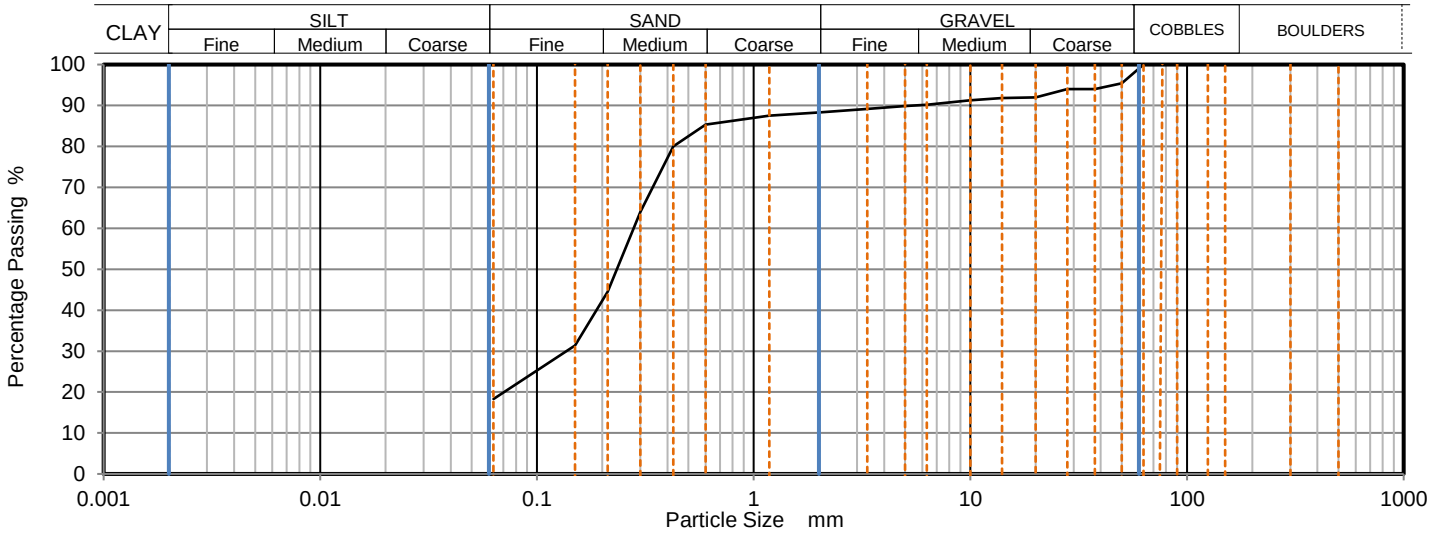
4041

Client:	Hydrock Consultants Ltd	Client Reference:	16488
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-034447-1
		Date Sampled:	30/07/2024
		Date Received:	01/08/2024
Contact:	Juliette Hurst	Date Tested:	09/08/2024
Site Address:	St John Street	Sampled By:	Client - JH

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

Test Results:

Laboratory Reference:	277354	Depth Top [m]:	2.50
Hole No.:	WS02	Depth Base [m]:	3.50
Sample Reference:	B2	Sample Type:	B
Sample Description:	Orangish brown gravelly clayey SAND		
Sample Preparation:	Sample was quartered, oven dried at 108.3 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	94		
28	94		
20	92		
14	92		
10	91		
6.3	90		
5	90		
3.35	89		
2	88		
1.18	88		
0.6	85		
0.425	80		
0.3	64		
0.212	45		
0.15	31		
0.063	18		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	12.00
Sand	70.00
Fines <0.063 mm	18.00

Grading Analysis		
D100	mm	63
D60	mm	0.279
D30	mm	0.137
D10	mm	
Uniformity Coefficient		4.4
Curvature Coefficient		

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

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

Remarks:

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

Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/08/2024

GF 366.11

4041

TEST CERTIFICATE

DETERMINATION OF THE CALIFORNIA BEARING RATIO (CBR)

Tested in Accordance with: BS 1377-2:2022 Cl. 15

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

Environmental Science

Client:	Hydrock Consultants Ltd	Client Reference:	16488
Client Address:	4 Lakeside, Festival Park, Stoke on Trent, ST1 5RY	Job Number:	24-034447-1
		Date Sampled:	30/07/2024
		Date Received:	01/08/2024
Contact:	Juliette Hurst	Date Tested:	12/08/2024
Site Address:	St John Street	Sampled By:	Client - JH

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

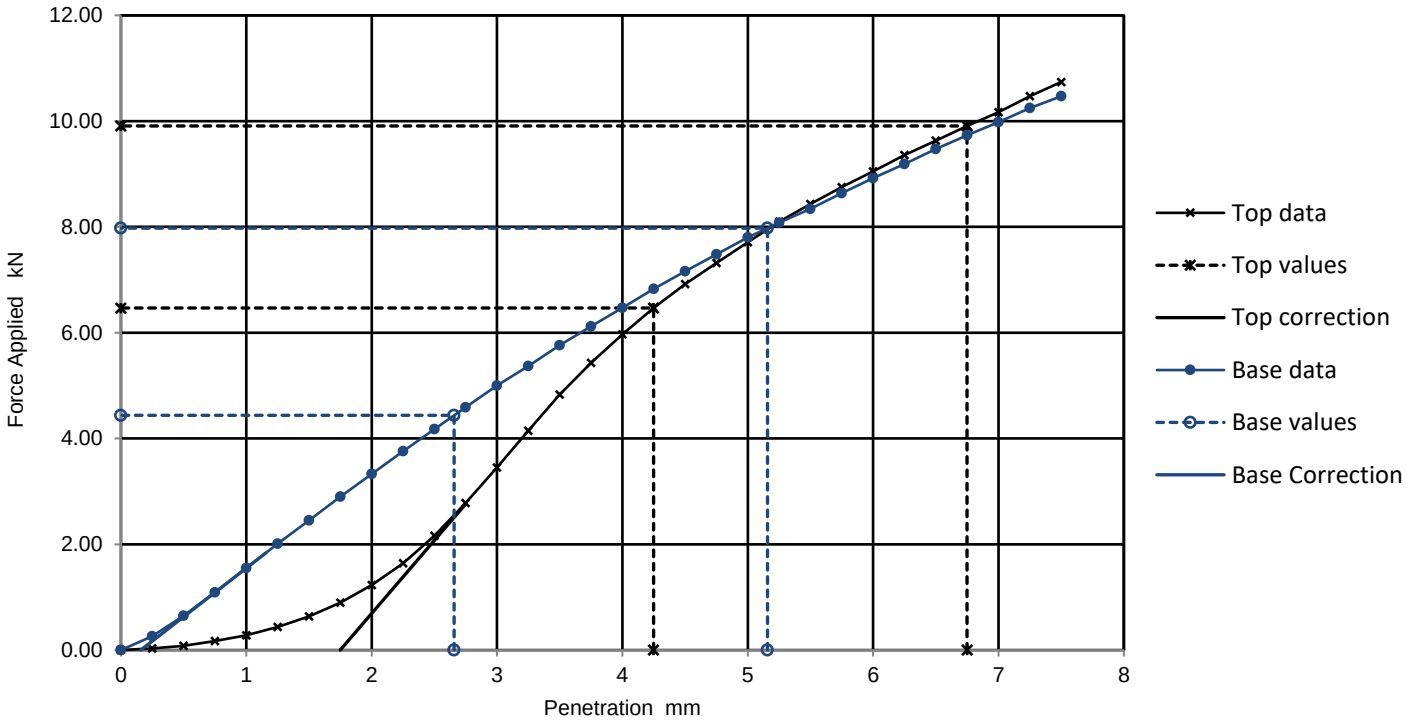
Test Results:

Laboratory Reference:	277356	Depth Top [m]:	0.30
Hole No.:	WS03	Depth Base [m]:	0.60
Sample Reference:	B2	Sample Type:	B
Sample Description:	Greyish Brown slightly gravelly SAND		

Specimen Preparation:

Condition	Remoulded			Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking	days
				Time to surface	days
				Amount of swell recorded	mm
Material retained on 20mm sieve removed		9	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	1.75	Mg/m3	Surcharge applied	8 kg
	Dry density	1.50	Mg/m3		4.8 kPa
	Water content	16	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Water Content %
TOP	Yes	49	50	50		16
BASE	Yes	34	40	40		16

Remarks:

Test/ Specimen specific remarks:

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Signed:

Monika Siewior
Reporting Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 16/08/2024

GF 593.1

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e: JulietteHurst@hydrock.com

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Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

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

Analytical Report Number : 24-034449

Project / Site name:	St John Street	**Samples received on:**	01/08/2024
Your job number:	16488	**Samples instructed on/ Analysis started on:**	05/08/2024
Your order number:	PO35667	**Analysis completed by:**	12/08/2024
Report Issue Number:	1	**Report issued on:**	12/08/2024
Samples Analysed:	2 soil samples		

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

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-034449
Project / Site name: St John Street
Your Order No: PO35667

Lab Sample Number				277357	277358
Sample Reference				WS04	WS01
Sample Number				D1	D1
Depth (m)				0.50	0.50-1.00
Date Sampled				30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	18
Total mass of sample received	kg	0.1	NONE	0.5	0.5
General Inorganics					
Loss on Ignition @ 450°C	%	0.2	MCERTS	1.4	9.7

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 24-034449
Project / Site name: St John Street

* 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 *
277357	WS04	D1	0.5	Brown loam and sand with gravel and vegetation
277358	WS01	D1	0.50-1.00	Black loam and sand with gravel and vegetation

Analytical Report Number : 24-034449
Project / Site name: St John Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Loss on ignition of soil @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	In-house method	L047	D	MCERTS

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

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

Hydrock

Client	Location or material to which this assessment applies
Vision Developments	MADE GROUND
Project	
8-8a St John Street	
Job number	
16488	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	3	3	3
No. tests in 20% data set	1	1	1
No. tests with suspected pyrite		0	
Maximum value	254	0.5	3.1
Mean of highest two values	144	0	3
Mean of highest 20%			
Characteristic Value	**254**	**0.5**	**3.1**
			Mg not required
	[no pyrite]	**[pyrite suspected]**	
DS Class	**DS-1**	**DS-2**	

If pyrite suspected, DS Class limited to **DS-2**

Is pyrite assumed to be present? No **Adopted DS Class =** **DS-1**

Water data

	(Adjusted) soluble sulfate (mg/l)	Soluble magnesium (mg/l)
Characteristic Value (Maximum Level)	0	0 **Mg not required**
DS Class		

pH data

	Soil	Water
Number of tests	3	0
No. tests in 20% data set	1	
Lowest pH	8.5	
Mean of lowest 20%	8.5	
Characteristic value	**8.5**	
Design value	**8.5**	

Number of soil pH results less than 5.5: 0

DS Class design value

Based on higher of soil and water data **DS-1**

ACEC Class design value

Brownfield

Mobile groundwater **AC-1**

Hydrock

Client	Location or material to which this assessment applies
Vision Developments	GLACIOFLUVIAL SHEET DEPOSITS
Project	
8-8a St John Street	
Job number	
16488	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	1	1	1
No. tests in 20% data set	0	0	
No. tests with suspected pyrite		0	
Maximum value	16.1	0	2.5
Mean of highest two values	16	0	3
Mean of highest 20%			
Characteristic Value	**16.1**	**0**	**2.5**

	[no pyrite]	[pyrite suspected]
DS Class	**DS-1**	**DS-1**

If pyrite suspected, DS Class limited to **DS-1**

Is pyrite assumed to be present? No **Adopted DS Class =** **DS-1**

Water data

	(Adjusted) soluble sulfate (mg/l)	Soluble magnesium (mg/l)
Characteristic Value (Maximum Level)	0	0

DS Class

pH data

	Soil	Water
Number of tests	1	0
No. tests in 20% data set	0	
Lowest pH	8.4	
Mean of lowest 20%		
Characteristic value	**8.4**	
Design value	**8.4**	

Number of soil pH results less than 5.5: 0

DS Class design value

Based on higher of soil and water data **DS-1**

ACEC Class design value

Natural ground

Mobile groundwater **AC-1 ***

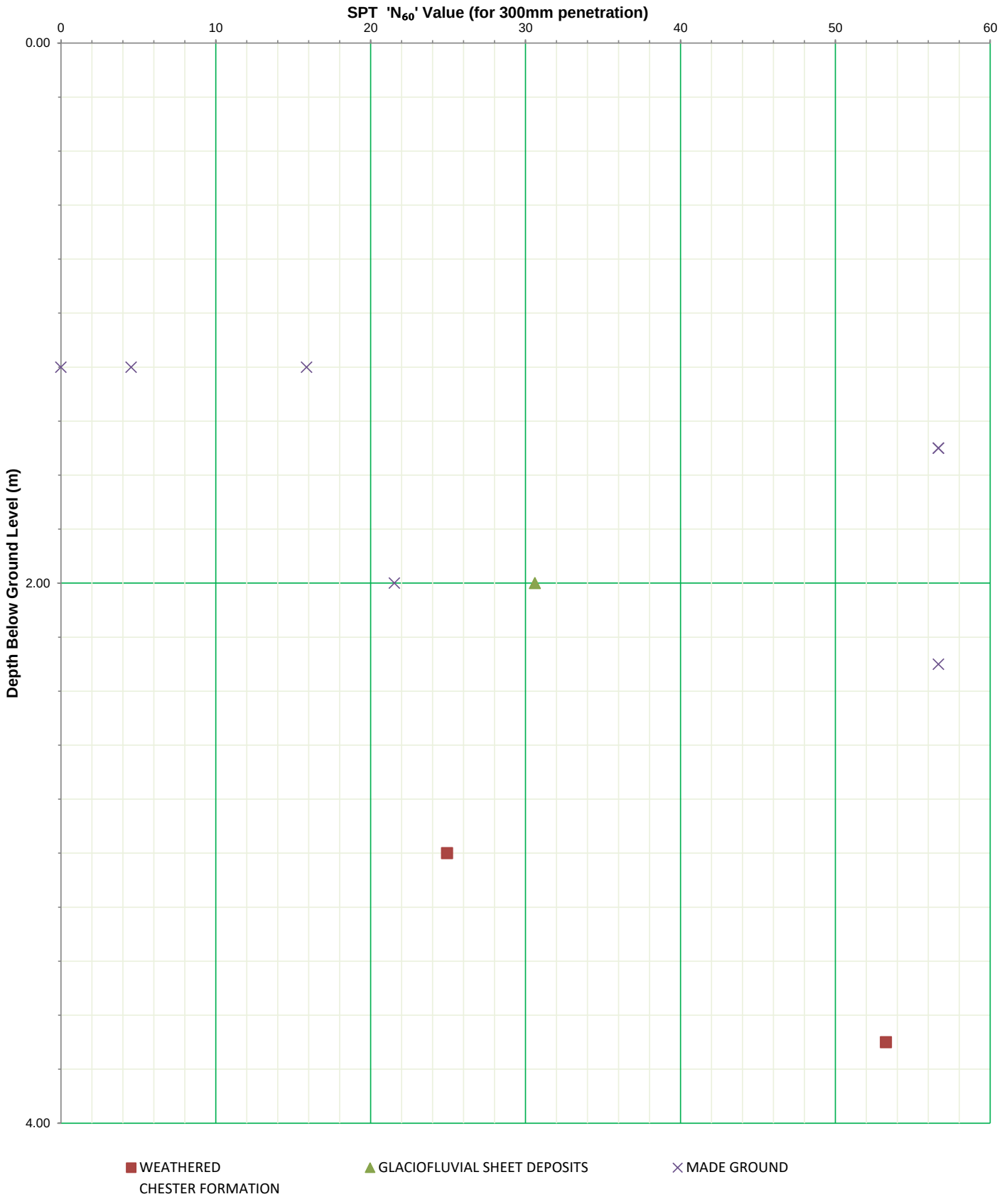
* increase to AC-2z in flowing water (pure or with >15mg/l carbon dioxide)

Geotechnical plots

Hydrock

SPT 'N_{60}' VALUES GRANULAR NATURAL STRATA vs DEPTH

Site:	Client:	Contract No.	16488
8-8a St John Street	Vision Developments	All Data	



Template Version	1.2	Template Date	16/05/2024

Appendix D Site monitoring data

Hydrock

Site: St John Street
Job number: C-16488-C
Client: Vision Developments

Gas analyser: GA5000
Equipment check OK: Y
Service in date: Y
Calibration check OK: Y
Name of person monitoring: See Notes.

Notes on site conditions:

Date	Operator	Weather Conditions
19/08/2024	IS	Sunny, dry and warm, 17-18 degrees air temperature and 7-8 mph wind speed.
28/08/2024	CW	Ligh Rain and overcast, 15-16 degrees air temperature and 2-4 mph wind speed.
09/09/2024	SM	Most cloudy with light rain, 12-13 degrees air temperature and 12-13 mph wind speed.
19/09/2024	CW	Clear and sunny, 16-18 degrees air temperature and 7-8 mph wind speed.
30/09/2024	CW	Overcast with light rain, 10-12 degrees air temperature and 9-10 mph wind speed.
08/10/2024	RC	Partly cloudy with light rain, 13 degrees air temperature and 5-6mph wind speed.

Notes: LEL = lower explosive limit = 5%v/v. * where the flow is less than the limit of detection of the instrument, the detection limit is reported (Highlighted in **blue**). GSVs are rounded to 3 places.

Monitoring round		Borehole details					Pressure and flow					Gas concentrations												GSV		Local conditions
													CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases				
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Atmospheric pressure (hPa)	Atm pressure falling / rising / steady	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	VOC (as ppm using PID)	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO (PPM)	H_2S (PPM)	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
							Max. individual values:			**1.0**				**0.2**		**4.0**		**2.8**		**20.7**			**0.001**	**0.020**	**Summary statistics for this monitoring period.**
							Min. individual values:			0.1				0.1		2.0		0.1		18.2			0.000	0.000	
							Worst-case GSVs based on max. individual flow and max. individual conc. over the duration of this table:																**0.002**	**0.028**	
19/08/24	PM	WS01	S	0.5 to 2.3	2.3	D	1009	S	0.00	0.1	0.1	NR	0.2	0.2	4	4	0.1	0.1	20.5	20.4	<1	<1	0.000	0.000	
19/08/24	PM	WS02	S	2.0 to 3.5	3.5	D	1009	S	-0.07	0.1	0.1	NR	0.1	0.1	2	2	2.5	2.5	20.7	18.2	<1	<1	0.000	0.003	
19/08/24	PM	WS03	S	0.5 to 1.2	1.2	D	1009	S	0.26	0.1	0.1	NR	0.1	0.1	2	2	0.4	0.4	20.6	19.9	<1	<1	0.000	0.000	
28/08/24	AM	WS01	S	0.5 to 2.3	2.3	D	1011	S	0.41	1.0	1.0	NR	0.1	0.1	2	2	0.5	0.5	20.4	20.4	<1	<1	0.001	0.005	
28/08/24	AM	WS02	S	2.0 to 3.5	3.5	D	1011	S	0.58	0.7	0.7	NR	0.1	0.1	2	2	1.8	1.8	19.2	19.2	<1	<1	0.001	0.013	
28/08/24	AM	WS03	S	0.5 to 1.2	1.2	D	1011	S	0.48	0.1	0.1	NR	0.1	0.1	2	2	1.0	1.0	19.4	19.4	<1	<1	0.000	0.001	
09/09/24	AM	WS01	S	0.5 to 2.3	2.3	D	1012	R	-0.03	0.1	0.1	NR	0.1	0.1	2	2	0.4	0.4	20.7	20.6	<1	<1	0.000	0.000	
09/09/24	AM	WS02	S	2.0 to 3.5	3.5	D	1012	R	-0.05	0.1	0.1	NR	0.1	0.1	2	2	2.5	2.4	19.1	19.0	<1	<1	0.000	0.002	
09/09/24	AM	WS03	S	0.5 to 1.2	1.2	D	1011	R	-0.10	0.1	0.1	NR	0.1	0.1	2	2	0.5	0.5	21.1	20.6	<1	<1	0.000	0.001	
19/09/24	AM	WS01	S	0.5 to 2.3	2.3	D	1026	F	-0.10	0.2	0.2	NR	0.1	0.1	2	2	0.3	0.3	20.9	20.7	<1	<1	0.000	0.001	
19/09/24	AM	WS02	S	2.0 to 3.5	3.5	D	1026	F	-0.29	0.7	0.7	NR	0.1	0.1	2	2	2.4	2.3	21.4	19.0	<1	<1	0.001	0.016	
19/09/24	AM	WS03	S	0.5 to 1.2	1.2	D	1026	F	-0.19	0.4	0.4	NR	0.1	0.1	2	2	2.6	2.6	21.2	18.6	<1	<1	0.000	0.010	
30/09/24	AM	WS01	S	0.5 to 2.3	2.3	D	997	F	-0.30	0.3	0.3	NR	0.1	0.1	2	2	0.6	0.6	20.5	20.5	<1	<1	0.000	0.002	
30/09/24	AM	WS02	S	2.0 to 3.5	3.5	D	997	F	-0.22	0.7	0.7	NR	0.1	0.1	2	2	2.8	2.8	21.1	18.6	<1	<1	0.001	0.020	
30/09/24	AM	WS03	S	0.5 to 1.2	1.2	D	997	F	-0.03	0.1	0.1	NR	0.1	0.1	2	2	1.6	1.6	20.9	18.3	<1	<1	0.000	0.002	
08/10/24	AM	WS01	S	0.5 to 2.3	2.30	D	986	F	0.00	0.2	0.3	NR	0.1	0.1	2	2	0.6	0.5	20.4	20.2	<1	<1	0.000	0.001	
08/10/24	AM	WS02	S	2.0 to 3.5	3.50	D	987	F	0.10	0.2	0.2	NR	0.1	0.1	2	2	2.8	2.7	19.1	18.5	<1	<1	0.000	0.005	
08/10/24	AM	WS03	S	0.5 to 1.2	1.20	D	1011	F	0.00	0.2	0.2	NR	0.1	0.1	2	2	1.2	1.2	20.6	19.4	<1	<1	0.000	0.002	

Appendix E Contamination test results and GQRA

Contamination test results

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e: reception@i2analytical.com

Analytical Report Number : 24-034093

Replaces Analytical Report Number: 24-034093, issue no. 1
Client sampling date amended.
Sampling dates added as per client's request.

Project / Site name:	8_8a St John Street	**Samples received on:**	02/08/2024
Your job number:	16488	**Samples instructed on/ Analysis started on:**	02/08/2024
Your order number:	PO35667	**Analysis completed by:**	08/08/2024
Report Issue Number:	2	**Report issued on:**	09/08/2024
Samples Analysed:	7 soil samples		

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

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

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275499	275500	275501	275502	275503
Sample Reference				WS04	WS04	WS02	WS02	WS02
Sample Number				1	2	1	2	3
Depth (m)				0.50	0.50-1.00	0.20	0.80	1.90-2.00
Date Sampled				30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	13	16	12	4.7
Total mass of sample received	kg	0.1	NONE	0.8	0.9	0.9	0.9	0.9
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	MWI	-	MWI	MWI	MWI
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	8.9	8.8	8.5	8.2	8.4
Free Cyanide	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	1500	-	-	160
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.148	-	-	0.016
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	45	68	120	48	32
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0223	0.0341	0.0615	0.0242	0.0161
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	22.3	34.1	61.5	24.2	16.1
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	-	4.8	-	-	6.4
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	2.4	-	-	3.2
Total Sulphur	mg/kg	50	MCERTS	-	680	-	-	56
Total Sulphur	%	0.005	MCERTS	-	0.068	-	-	0.006
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	< 0.5	-	-	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.05	-	-	< 0.05
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0051	-	0.023	0.012	0.0024
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	-	< 2.0	-	-	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	-	< 5.0	-	-	< 5.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275499	275500	275501	275502	275503
Sample Reference				WS04	WS04	WS02	WS02	WS02
Sample Number				1	2	1	2	3
Depth (m)				0.50	0.50-1.00	0.20	0.80	1.90-2.00
Date Sampled				30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	0.56	0.06	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	0.07	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	0.09	0.09	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.06	-	0.09	0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.43	-	1.1	0.73	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.11	-	0.26	0.13	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.56	-	1.4	0.87	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.56	-	1.3	0.77	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.28	-	0.74	0.35	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.27	-	0.69	0.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.3	-	1.1	0.53	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.1	-	0.26	0.12	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.26	-	0.79	0.33	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.13	-	0.5	0.16	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	0.21	0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.18	-	0.56	0.17	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.25	-	9.67	4.69	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	-	14	16	6.3
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	-	1.8	0.63	0.44
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	-	0.6	0.3	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	0.8	< 0.2	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	11	-	27	14	47
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	-	27	14	47
Copper (aqua regia extractable)	mg/kg	1	MCERTS	28	-	66	27	9.1
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	-	90	88	8.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	-	< 0.3	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.8	-	29	13	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	16	-	31	25	14
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	-	74	60	42
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	2.6	-	-	< 2.5
Magnesium (water soluble)	mg/kg	5	NONE	-	5.2	-	-	< 5.0

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Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275499	275500	275501	275502	275503
Sample Reference				WS04	WS04	WS02	WS02	WS02
Sample Number				1	2	1	2	3
Depth (m)				0.50	0.50-1.00	0.20	0.80	1.90-2.00
Date Sampled				30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPHCWG - Aliphatic >EC16 - EC35 $_{EH_CU_1D_AL}$	mg/kg	10	MCERTS	< 10	-	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPHCWG - Aliphatic >EC35 - EC44 $_{EH_CU_1D_AL}$	mg/kg	8.4	NONE	< 8.4	-	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	< 10	-	-	-	-
TPHCWG - Aliphatic >EC5 - EC44 $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	< 10	-	-	-	-
TPHCWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	< 0.010	-	-	-	-
TPHCWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.02	MCERTS	< 0.020	-	-	-	-
TPHCWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPHCWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPHCWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	-	-	-	-
TPHCWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	-	-	-	-
TPHCWG - Aromatic >EC35 - EC44 $_{EH_CU_1D_AR}$	mg/kg	8.4	NONE	< 8.4	-	-	-	-
TPHCWG - Aromatic >EC5 - EC35 $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	< 10	-	-	-	-
TPHCWG - Aromatic >EC5 - EC44 $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	< 10	-	-	-	-
TPH Total >EC5 - EC44 $_{EH_CU+HS_1D_TOTAL}$	mg/kg	10	NONE	< 10	-	-	-	-
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	-	-	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
p & m-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	-	-	-	-

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

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Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275504	275505
Sample Reference				WS01	WS03
Sample Number				1	1
Depth (m)				0.50	1.00
Date Sampled				30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	14
Total mass of sample received	kg	0.1	NONE	0.9	0.9
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	MWI
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	10.4	8.5
Free Cyanide	mg/kg	1	MCERTS	-	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	2900	2400
Total Sulphate as SO_4	%	0.005	MCERTS	0.291	0.239
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	510	56
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.254	0.0282
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	254	28.2
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	35	3.7
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	17	1.8
Total Sulphur	mg/kg	50	MCERTS	1700	1000
Total Sulphur	%	0.005	MCERTS	0.172	0.105
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	0.015
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	4.7	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0

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Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275504	275505
Sample Reference				WS01	WS03
Sample Number				1	1
Depth (m)				0.50	1.00
Date Sampled				30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	-	0.4
Acenaphthylene	mg/kg	0.05	MCERTS	-	0.18
Acenaphthene	mg/kg	0.05	MCERTS	-	0.37
Fluorene	mg/kg	0.05	MCERTS	-	0.28
Phenanthrene	mg/kg	0.05	MCERTS	-	3
Anthracene	mg/kg	0.05	MCERTS	-	0.76
Fluoranthene	mg/kg	0.05	MCERTS	-	3.7
Pyrene	mg/kg	0.05	MCERTS	-	3.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.7
Chrysene	mg/kg	0.05	MCERTS	-	1.7
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	2.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	0.73
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.29
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	1.3
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	23.5
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	26
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	-	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8
Chromium (III)	mg/kg	1	NONE	-	19
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	67
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	190
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	1.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	110
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	3.1
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	6.3

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Analytical Report Number: 24-034093
Project / Site name: 8_8a St John Street
Your Order No: PO35667

Lab Sample Number				275504	275505
Sample Reference				WS01	WS03
Sample Number				1	1
Depth (m)				0.50	1.00
Date Sampled				30/07/2024	30/07/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**		
Petroleum Hydrocarbons					
TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.01	MCERTS	-	< 0.010
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.01	MCERTS	-	< 0.010
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.01	MCERTS	-	< 0.010
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	< 1.0
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	< 2.0
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	11
TPHCWG - Aliphatic >EC16 - EC35 EH_CU_1D_AL	mg/kg	10	MCERTS	-	35
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	24
TPHCWG - Aliphatic >EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	-	< 8.4
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	35
TPHCWG - Aliphatic >EC5 - EC44 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	35
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	MCERTS	-	< 0.010
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	MCERTS	-	< 0.010
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.02	MCERTS	-	< 0.020
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-	< 1.0
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-	< 2.0
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-	< 10
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-	15
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	-	< 8.4
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	15
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	15
TPH Total >EC5 - EC44 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-	50
VOCs					
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	-	< 5.0
Benzene	µg/kg	5	MCERTS	-	< 5.0
Toluene	µg/kg	5	MCERTS	-	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	-	< 5.0
p & m-Xylene	µg/kg	5	MCERTS	-	< 5.0
o-Xylene	µg/kg	5	MCERTS	-	< 5.0

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

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Analytical Report Number : 24-034093
Project / Site name: 8_8a St John Street

* 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 *
275499	WS04	1	0.5	Brown sand with gravel
275500	WS04	2	0.50-1.00	Brown sand with gravel
275501	WS02	1	0.2	Brown sand with gravel
275502	WS02	2	0.8	Brown sand with gravel
275503	WS02	3	1.90-2.00	Brown sand with gravel
275504	WS01	1	0.5	Brown sand with gravel
275505	WS03	1	1	Brown sand with gravel

Analytical Report Number : 24-034093
Project / Site name: 8_8a St John Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088	D/W	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE

Analytical Report Number : 24-034093
Project / Site name: 8_8a St John Street

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	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	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS

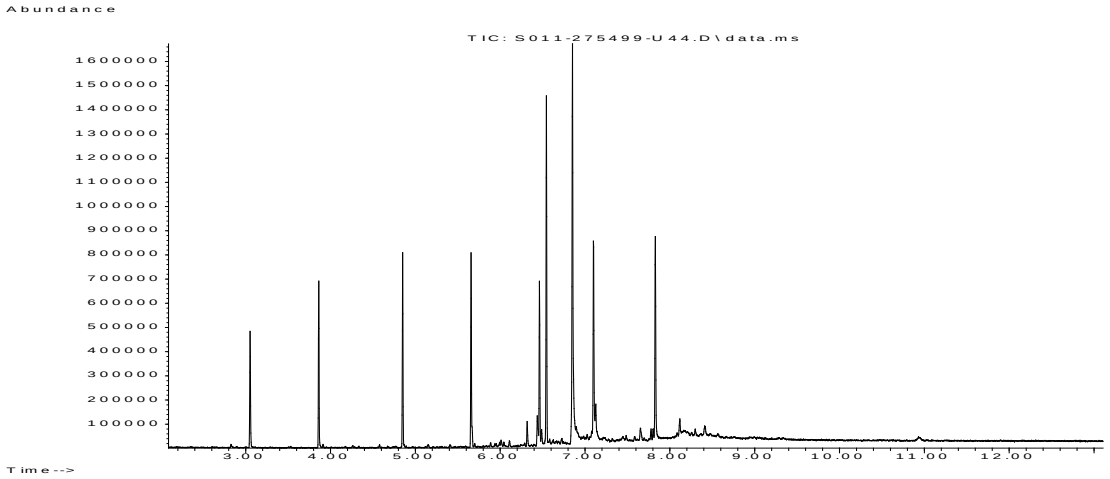
For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' analysis have been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

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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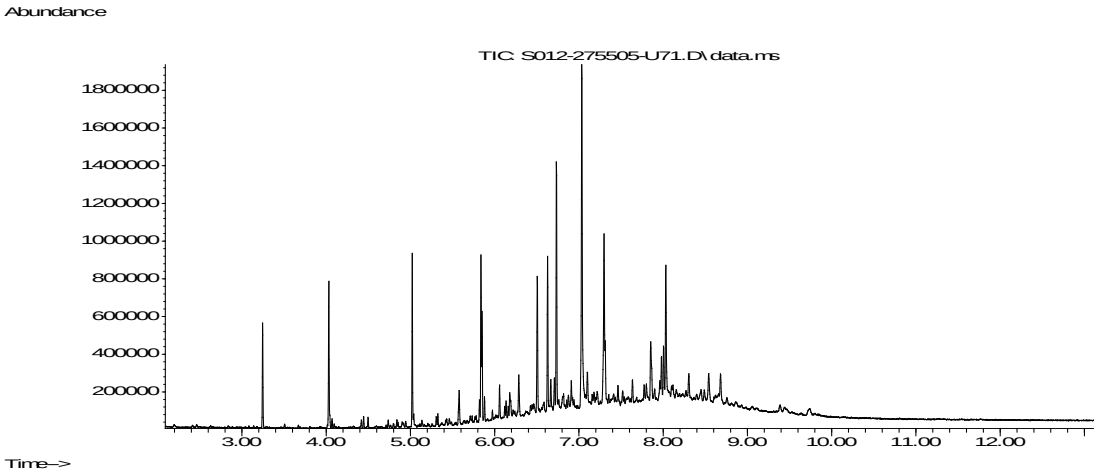
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GAC derivation

Background

Initially, the Hydrock GAC were derived following the publishing of soil guideline values (SGV), toxicological (TOX) reports and associated publications by the Environment Agency (EA) in 2009 referenced under Science Report SC050021 (EA, 2009a, b, c, d). The Hydrock GAC have then been periodically updated following publication of new information on toxicological, physico-chemical, land use or receptor parameters, namely:

- LQM/CIEH, 2009. LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment, second edition. Nathanial, C. P., McCaffrey, C., Ashmore, M., Cheng, Y., Gillet, A. G., Ogden, R. C. and Scott, D.
- CL:AIRE, 2010. 'The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment'. Environmental Industries Commission, The Association of Geotechnical and Geoenvironmental Specialists and Contaminated Land: Applications in Real Environment.
- CL:AIRE, 2014. 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010. Contaminated Land: Applications in Real Environment.
- LQM/CIEH, 2015. 'The LQM/CIEH S4ULs for Human Health Risk Assessment'. Nathanial, C. P., McCaffrey, C., Gillet, A. G., Ogden, R. C. and Nathanial, J. F.
- CL:AIRE, 2021-2024. 'C4SL Phase 2 Technical Reports'. Contaminated Land: Applications in Real Environment.
- CL:AIRE, 2022. C4SL Phase 2 Technical Report for 1,2-dichloroethane. Contaminated Land: Applications in Real Environment.
- CL:AIRE, 2024. C4SL Phase 2 Technical Reports for cis-1,2-dichloroethene, trans-1,2-dichloroethene and naphthalene. Contaminated Land: Applications in Real Environment.

Land use scenarios

Hydrock has derived generic assessment criteria (GAC) for human health based on the six exposure scenarios defined in CL:AIRE (2014) using generic default assumptions from published guidance. GAC for each exposure scenario have been derived for three soil organic matter (SOM) contents, 1%, 2.5% and 6%.

All GAC have been rounded to two significant figures.

Exposure parameters

The exposure parameters used for the Hydrock GAC are the default parameters stated in SR3, unless updated in CL:AIRE (2014) where the CL:AIRE (2014) values have been adopted.

Approach to consumption rates

Hydrock have adopted the 90th percentile consumption rates from Table 3.4 of CL:AIRE (2014) for all produce types. This is noted to be more conservative than the "top two" approach taken in the derivation of C4SLs.

Approach to plant uptake for GAC omitted in CL:AIRE (2010)

Plant uptake factors were not identified in CL:AIRE (2010) for antimony, barium and molybdenum. Hydrock has sourced the required parameter values from ORNL (1984) in order to derive GAC that are inclusive of the homegrown produce exposure pathway.

Chemical and toxicity parameters

The chemical and toxicity parameters have been adopted based on the following documents:

- IRIS, 2016. 'Toxicological Review of Trimethylbenzenes'. Integrated Risk Information System, National Centre for Environmental Assessment, office of Research and Development, U.S. Environmental Protection Agency.
- LQM/CIEH, 2015.
- ORNL, 1984. 'ORNL-5786. A Review and Analysis of Parameters for Assessing Transport of Environmentally released Radionuclides through Agriculture'. Oak Ridge National Laboratory.
- CL:AIRE, 2010.
- RIVM, 2001. RIVM Report 711701 025 'HCV Re-evaluation of human-toxicological maximum-permissible risk levels'. National Institute of Public Health and the Environment.
- LQM/CIEH, 2009.
- EA, 2009a.

Approach to Cyanide GAC

The Hydrock GAC for free cyanide have been derived based on ingestion of a bolus of contaminated soil. The GAC are derived for acute exposure of a child (0-6 years old) for all land uses except commercial, where the GAC are derived for acute exposure of an adult (16-65 years old). For the purpose of GQRA, the child value may be adopted for all land use scenarios.

For complex cyanide, the GAC have been derived based on chronic exposure, using the default exposure scenarios but excluding the consumption of homegrown produce, soil attached to homegrown produce, indoor vapour and outdoor vapour pathways. The chronic health criteria value (HCV) for complex cyanide is based on the EA (2009a) HCV for free cyanide and the ratio of toxicity between free and complex cyanide proposed by RIVM (2001).

Approach to Phenol GAC

In accordance with the EA Science Report SC050021 / Phenol SGV, a $GAC_{ing/inh}$ has been derived for ingested and inhaled phenol using the CLEA model, with a GAC_{derm} derived for dermal contact using Equation 5.7 within SR3. The lower of the $GAC_{ing/inh}$ and GAC_{derm} has been adopted as the final GAC.

Approach to PCB GAC

GAC for assessing the non-dioxin-like risk from PCBs have been based on the "Dutch 7". As the TDI used by the authors of the Dutch guidance is for the sum of the 7 individual congeners, the TDI has been divided by 7 to create a TDI for each congener. The non-dioxin-like risk from PCBs is therefore assessed using a Hazard Index approach as for total petroleum hydrocarbons (TPH).

Sub-surface soil to indoor air correction factors

Reflecting the approach taken by the Environment Agency in the development of revised SGV in 2009 for BTEX, a sub-surface soil to indoor air correction factor of 10 has been applied for petroleum hydrocarbons in order to account for over-prediction of vapour intrusion into building using the Johnson and Ettinger approach.

The correction factor of 10 has been applied to the following petroleum hydrocarbons (it makes negligible difference to less volatile TPH and PAH compounds):

- TPHCWG fractions, namely aliphatic EC>5-44 and aromatic EC>6-44;
- PAHs (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene), benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h,)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene);
- BTEX;
- Isopropylbenzene;

- Propylbenzene;
- 1,2,4- and 1,3,5-trimethylbenzene; and
- Styrene.

Approach to saturation limits

The CLEA model includes a traffic light colour system to highlight when saturated soil conditions have potentially been exceeded for the vapour pathways during calculation of assessment criteria. The colours represent:

- Green: the assessment criteria do not exceed the saturated soil concentration.
- Amber: the assessment criteria exceed the saturated soil concentration but the contribution of the indoor and outdoor vapour pathway to total exposure is less than 10% and will not significantly affect the assessment criteria.
- Red: the assessment criteria exceed the saturated soil concentration and the contribution of the indoor and outdoor vapour pathway to total exposure is greater than 10% and will significantly affect the assessment criteria.

Hydrock have not applied any further calculations or assessment in relation to saturation limits during GAC derivation, with the CLEA-modelled GAC being presented as the GAC. Consideration of saturation limits is undertaken during the data assessment stage.

References

CL:AIRE, 2010. 'The EIC/AGS/CL:AIRE Soil Generic Assessment Criteria for Human Health Risk Assessment'. Environmental Industries Commission, The Association of Geotechnical and Geoenvironmental Specialists and Contaminated Land: Applications in Real Environment.

CL:AIRE, 2014. 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination', Revision 2, DEFRA research project SP1010. Contaminated Land: Applications in Real Environment

CL:AIRE, 2021-2024. C4SL Phase 2 Technical Reports for tetrachloroethene, trichloroethene and vinyl chloride. Contaminated Land: Applications in Real Environment.

CL:AIRE, 2022. C4SL Phase 2 Technical Report for 1,2-dichloroethane. Contaminated Land: Applications in Real Environment.

CL:AIRE, 2024. C4SL Phase 2 Technical Reports for cis-1,2-dichloroethene, trans-1,2-dichloroethene and naphthalene. Contaminated Land: Applications in Real Environment.

EA, 2009a. 'Science Reports SC050021 – SGV and TOX reports for: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs'; 'Supplementary information for the derivation of SGV for: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs', and 'Contaminants in soil: updated collation of toxicological data and intake values for humans: benzene, toluene, ethylbenzene, xylene, arsenic, nickel, mercury, selenium, cadmium, inorganic cyanide, phenol, dioxins, furans and dioxin-like PCBs'. Environment Agency.

EA, 2009b. 'Science Report – SC050021/SR2. Human health toxicological assessment of contaminants in soil'. Environment Agency.

EA, 2009c. 'Science Report – SC050021/SR3. Updated technical background to the CLEA model'. Environment Agency.

EA, 2009d. 'Science Report – SC050021/SR4. CLEA Software (version 1.05) Handbook'. Environment Agency.

IRIS, 2016. 'Toxicological Review of Trimethylbenzenes'. Integrated Risk Information System, National Centre for Environmental Assessment, office of Research and Development, U.S. Environmental Protection Agency.

LQM/CIEH, 2009. LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment, second edition. Nathanial, C. P., McCaffrey, C., Ashmore, M., Cheng, Y., Gillet, A. G., Ogden, R. C. and Scott, D.

LQM/CIEH, 2015. 'The LQM/CIEH S4ULs for Human Health Risk Assessment'. Nathanial, C. P., McCaffrey, C., Gillet, A. G., Ogden, R. C. and Nathanial, J. F.

ORNL, 1984. 'ORNL-5786. A Review and Analysis of Parameters for Assessing Transport of Environmentally released Radionuclides through Agriculture'. Oak Ridge National Laboratory.

RIVM, 2001. RIVM Report 711701 025 'HCV Re-evaluation of human-toxicological maximum-permissible risk levels'. National Institute of Public Health and the Environment.

Human health GQRA

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter: Default - Human Health - residential with home-grown produce (1%SOM)
Client: Vision Developments
Site: 8-8a St John Street
Job no.: 16488
Lab. report no(s).: 24-034093-2

Data Filters
Zone: All
Strata: All
Depth Min (m bgl): 0.2
Depth Max (m bgl): 2

Dataset mean SOM%: 1.98
Scenario SOM%: 1

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @1% SOM	GAC	GAC Source	Date	30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
														Zone	1	1	1	1	2
														Location	WS04	WS02	WS02	WS03	WS02
														Depth (m bgl)	0.5	0.2	0.8	1	2
														Strata	MG	MG	MG	MG	GSD
-	**Asbestos**																		
P1020	Asbestos Identified	text	Y/N	3	-	-	-	-	No. of detects:	0	-	-	-		N	N	N	N	N
-	**Hydrock Default Suite - FOC / SOM / pH**										-								
P1085	FOC (dimensionless)	|l	0.001	5	0.002	0.023	0.012	0.012	0.01		-	-	-		0.0051	0.023	0.012	0.015	0.0024
-	SOM (calculated)	%	0.1724	5	0.41	3.97	1.98	2.07	1.41		-	-	-		0.87924	3.9652	2.0688	2.586	0.41376
P1334	pH (su)	pH Units	0.1	5	8.20	8.90	8.50	8.50	0.25		-	-	-		8.9	8.5	8.2	8.5	8.4
-	**Hydrock Default Suite - Metals & PAH**																		
7440-38-2	Arsenic	mg/kg	1	5	6.30	26.00	15.46	15.00	7.03	0	NR	37	C4SL - CL:AIRE 2014		15	14	16	26	6.3
7440-41-7	Beryllium	mg/kg	0.06	5	0.41	**1.80**	0.84	0.63	0.57	**1**	NR	1.7	Hydrock Derived		0.41	1.8	0.63	0.93	0.44
7440-42-8	Boron	mg/kg	0.2	5	0.20	0.60	0.40	0.40	0.16	0	NR	300	Hydrock Derived		<0.2	0.6	0.3	0.5	0.4
7440-43-9	Cadmium	mg/kg	0.2	5	0.20	0.80	0.34	0.20	0.26	0	NR	22	C4SL - CL:AIRE 2014		<0.2	0.8	<0.2	<0.2	0.3
16065-83-1	Chromium (III)	mg/kg	1	5	11.00	47.00	23.60	19.00	14.42	0	NR	890	Hydrock Derived		11	27	14	19	47
18540-29-9	Chromium (VI)	mg/kg	1.8	5	1.80	1.80	1.80	1.80	0.00	0	NR	21	C4SL - CL:AIRE 2014		<1.8	<1.8	<1.8	<1.8	<1.8
7440-47-3	Chromium (Total)	mg/kg	1	5	12.00	47.00	23.80	19.00	14.20			-			12	27	14	19	47
7440-50-8	Copper	mg/kg	1	5	9.10	67.00	39.42	28.00	25.84	0	NR	2500	Hydrock Derived		28	66	27	67	9.1
7439-92-1	Lead	mg/kg	1	5	8.80	190.00	111.36	90.00	74.86	0	NR	200	C4SL - CL:AIRE 2014		180	90	88	190	8.8
7439-97-6	Mercury, inorganic	mg/kg	0.3	5	0.30	1.50	0.58	0.40	0.52	0	NR	40	Hydrock Derived		0.4	<0.3	0.4	1.5	<0.3
7440-02-0	Nickel	mg/kg	1	5	8.80	29.00	16.36	13.00	7.97	0	NR	130	Hydrock Derived		8.8	29	13	19	12
7782-49-2	Selenium	mg/kg	1	5	1.00	1.00	1.00	1.00	0.00	0	NR	260	Hydrock Derived		<1	<1	<1	<1	<1
7440-62-2	Vanadium	mg/kg	1	5	14.00	31.00	22.40	25.00	7.16	0	NR	410	Hydrock Derived		16	31	25	26	14
7440-66-6	Zinc	mg/kg	1	5	42.00	110.00	69.60	62.00	25.31	0	NR	3900	Hydrock Derived		62	74	60	110	42
P1095	Cyanide (free)	mg/kg	1	5	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020		<1	<1	<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	5	1.00	1.00	1.00	1.00	0.00	0	24237	120	Hydrock Derived		<1	<1	<1	<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	5	0.05	0.37	0.13	0.09	0.14	0	57	230	Hydrock Derived		<0.05	0.09	0.09	0.37	<0.05
208-96-8	Acenaphthylene	mg/kg	0.05	5	0.05	0.18	0.08	0.05	0.06	0	86	180	Hydrock Derived		<0.05	0.07	<0.05	0.18	<0.05
120-12-7	Anthracene	mg/kg	0.05	5	0.05	0.76	0.26	0.13	0.29	0	1.17	2400	Hydrock Derived		0.11	0.26	0.13	0.76	<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	5	0.05	1.70	0.62	0.35	0.65	0	1.71	8.9	Hydrock Derived		0.28	0.74	0.35	1.7	<0.05
50-32-8	Benzo(a)pyrene	mg/kg	0.05	5	0.05	2.00	0.69	0.33	0.78	0	0.91	5	C4SL - CL:AIRE 2014		0.26	0.79	0.33	2	<0.05
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	5	0.05	**2.80**	0.96	0.53	1.10	**1**	1.22	2.6	Hydrock Derived		0.3	1.1	0.53	2.8	<0.05
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	5	0.05	1.30	0.45	0.18	0.51	0	0.02	320	Hydrock Derived		0.18	0.56	0.17	1.3	<0.05
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	5	0.05	0.73	0.25	0.12	0.28	0	0.69	78	Hydrock Derived		0.1	0.26	0.12	0.73	<0.05
218-01-9	Chrysene	mg/kg	0.05	5	0.05	1.70	0.60	0.30	0.66	0	0.44	15	Hydrock Derived		0.27	0.69	0.3	1.7	<0.05
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	5	0.05	**0.29**	0.13	0.05	0.11	**1**	0.004	0.25	Hydrock Derived		<0.05	0.21	0.05	0.29	<0.05
206-44-0	Fluoranthene	mg/kg	0.05	5	0.05	3.70	1.32	0.87	1.42	0	19	290	Hydrock Derived		0.56	1.4	0.87	3.7	<0.05
86-73-7	Fluorene	mg/kg	0.05	5	0.05	0.28	0.11	0.06	0.10	0	31	180	Hydrock Derived		0.06	0.09	0.05	0.28	<0.05
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	5	0.05	1.00	0.37	0.16	0.39	0	0.06	28	Hydrock Derived		0.13	0.5	0.16	1	<0.05
91-20-3	Naphthalene	mg/kg	0.05	5	0.05	0.56	0.22	0.06	0.24	0	76	13	Hydrock Derived		<0.05	0.56	0.06	0.4	<0.05
85-01-8	Phenanthrene	mg/kg	0.05	5	0.05	3.00	1.06	0.73	1.15	0	36	98	Hydrock Derived		0.43	1.1	0.73	3	<0.05
129-00-0	Pyrene	mg/kg	0.05	5	0.05	3.30	1.20	0.77	1.26	0	2.2	620	Hydrock Derived		0.56	1.3	0.77	3.3	<0.05
P1310	PAH 16 Total	mg/kg	0.8	5	0.80	23.50	8.38	4.69	9.05			-			3.25	9.67	4.69	23.5	<0.8
-	**TPH fractions**																		
P1407	TPH ali EC05-EC06	mg/kg	0.001	2	0.01	0.01	0.01	0.01	0.000	0	304	42	Hydrock Derived		<0.01			<0.01	
P1408	TPH ali >EC06-EC08	mg/kg	0.001	2	0.01	0.01	0.01	0.01	0.000	0	144	100	Hydrock Derived		<0.01			<0.01	
P1409	TPH ali >EC08-EC10	mg/kg	0.001	2	0.01	0.01	0.01	0.01	0.000	0	78	27	Hydrock Derived		<0.01			<0.01	
P1410	TPH ali >EC10-EC12	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	48	130	Hydrock Derived		<1			<1	
P1411	TPH ali >EC12-EC16	mg/kg	2	2	2.00	2.00	2.00	2.00	0.00	0	24	1100	Hydrock Derived		<2			<2	
P1412	TPH ali >EC16-EC21	mg/kg	8	2	8.00	11.00	9.50	9.50	2.12			-			<8			11	
P1413	TPH ali >EC21-EC35	mg/kg	8	2	8.00	24.00	16.00	16.00	11.31			-			<8			24	

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter:	Default - Human Health - residential with home-grown produce (1%SOM)
Client:	Vision Developments
Site:	8-8a St John Street
Job no.:	16488
Lab. report no(s).:	24-034093-2

Data Filters

Zone	All
Strata	All
Depth Min (m bgl)	0.2
Depth Max (m bgl)	2
Dataset mean SOM%	1.98
Scenario SOM%	1

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @1% SOM	GAC	GAC Source	Strata	30/07/2024 WS04 0.5	30/07/2024 WS02 0.2	30/07/2024 WS02 0.8	30/07/2024 WS03 1	30/07/2024 WS02 2
														Date	30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
														Zone	1	1	1	1	2
														Location	WS04	WS02	WS02	WS03	WS02
														Depth (m bgl)	0.5	0.2	0.8	1	2
P1938	TPH ali >EC16-EC35	mg/kg	10	2	10.00	35.00	22.50	22.50	17.68	0	8	65000	Hydrock Derived		<10			35	
P1415	TPH ali >EC35-EC44	mg/kg	8.4	2	8.40	8.40	8.40	8.40	0.00	0	8	65000	Hydrock Derived		<8.4			<8.4	
P1418	TPH ali >EC5-EC35	mg/kg	10	2	10.00	35.00	22.50	22.50	17.68			-			<10			35	
P1420	TPH ali >EC5-EC44	mg/kg	10	2	10.00	35.00	22.50	22.50	17.68			-			<10			35	
P1441	TPH aro EC05-EC07	mg/kg	0.001	2	0.01	0.01	0.01	0.01	0.00	0	1218	73	Hydrock Derived		<0.01			<0.01	
P1355	TPH aro >EC07-EC08	mg/kg	0.001	2	0.01	0.01	0.01	0.01	0.00	0	869	130	Hydrock Derived		<0.01			<0.01	
P1356	TPH aro >EC08-EC10	mg/kg	0.001	2	0.02	0.02	0.02	0.02	0.00	0	613	35	Hydrock Derived		<0.02			<0.02	
P1357	TPH aro >EC10-EC12	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	364	75	Hydrock Derived		<1			<1	
P1358	TPH aro >EC12-EC16	mg/kg	2	2	2.00	2.00	2.00	2.00	0.00	0	169	140	Hydrock Derived		<2			<2	
P1359	TPH aro >EC16-EC21	mg/kg	10	2	10.00	10.00	10.00	10.00	0.00	0	54	260	Hydrock Derived		<10			<10	
P1360	TPH aro >EC21-EC35	mg/kg	10	2	10.00	15.00	12.50	12.50	3.54	0	5	1100	Hydrock Derived		<10			15	
P1362	TPH aro >EC35-EC44	mg/kg	8.4	2	8.40	8.40	8.40	8.40	0.00	0	5	1100	Hydrock Derived		<8.4			<8.4	
P1365	TPH aro >EC5-EC35	mg/kg	10	2	10.00	15.00	12.50	12.50	3.54			-			<10			15	
P1941	TPH aro >EC5-EC44	mg/kg	10	2	10.00	15.00	12.50	12.50	3.54			-			<10			15	
-	**VOCs - BTEX & MTBE**																		
71-43-2	Benzene	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	1218	0.2	C4SL - CL:AIRE 2014		<0.005			<0.005	
108-88-3	Toluene	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	869	130	Hydrock Derived		<0.005			<0.005	
100-41-4	Ethylbenzene	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	518	47	Hydrock Derived		<0.005			<0.005	
95-47-6	Xylene, o-	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	478	61	Hydrock Derived		<0.005			<0.005	
1330-20-7	Xylene, p- (or combined m & p)	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	576	57	Hydrock Derived		<0.005			<0.005	
1634-04-4	MTBE	mg/kg	1	2	0.01	0.01	0.01	0.01	0.00	0	20358	62	Hydrock Derived		<0.005			<0.005	
	TPH Additivity Check			**HAZARD QUOTIENTS FOR EACH FRACTION**															
													Aliphatics >EC5-EC6		0.000238095			0.000238095	
													Aliphatics >EC6-EC8		0.0001			0.0001	
													Aliphatics >EC8-EC10		0.00037037			0.00037037	
													Aliphatics >EC10-EC12		0.007692308			0.007692308	
													Aliphatics >EC12-EC16		0.001818182			0.001818182	
													Aliphatics >EC16-EC35		0.000153846			0.000538462	
													Aliphatics >EC35-EC44		0.000129231			0.000129231	
													Aromatics EC5-EC7		0.000136986			0.000136986	
													Aromatics >EC7-EC8		7.69231E-05			7.69231E-05	
													Aromatics >EC8-EC10		0.000571429			0.000571429	
													Aromatics >EC10-EC12		0.013333333			0.013333333	
													Aromatics >EC12-EC16		0.014285714			0.014285714	
													Aromatics >EC16-EC21		0.038461538			0.038461538	
													Aromatics >EC21-EC35		0.009090909			0.013636364	
													Aromatics >EC35-EC44		0.007636364			0.007636364	
													Hazard Index for ali>C8-C16		**0.00988086**			**0.00988086**	
													Hazard Index for aro>C8-C16		**0.028190476**			**0.028190476**	
													Hazard Index for aro>C16-C35		**0.047552448**			**0.052097902**	

Considered additive (Aliphatics >EC8-EC10, >EC10-EC12, >EC12-EC16)

Considered additive (Aromatics >EC8-EC10, >EC10-EC12, >EC12-EC16)

Considered additive (Aromatics >EC16-EC21, >EC21-EC35)

Hazard Index table - HI or HQ greater than 1 highlighted with orange shading.

Legend:

MG	Made Ground
GSD	Glaciofluvial Sheet Deposits

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
'<10	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
*	represents a data point that is not included in the current filter settings

Template Version:
1.09: 11/03/24

Phytotoxic GQRA

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter: Phytotoxic pH >7

Client: Vision Developments

Site: 8-8a St John Street

Job no.: 16488

Lab. report no(s).: 24-034093-2

Data Filters

Zone	All
Strata	All
Depth Min (m bgl)	0.2
Depth Max (m bgl)	2
Dataset mean pH	8.50
Scenario pH	>7

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Strata	WS04 @ 0.5	WS02 @ 0.2	WS02 @ 0.8	WS03 @ 1	WS02 @ 2
													Date	30/07/2024	30/07/2024	30/07/2024	30/07/2024	30/07/2024
													Zone	1	1	1	1	2
													Location	WS04	WS02	WS02	WS03	WS02
													Depth (m bgl)	0.5	0.2	0.8	1	2
-	**Hydrock Default Suite - FOC / SOM / pH**																	
P1334	pH (su)	pH Units	0.1	5	8.20	8.90	8.50	8.50	0.25		-	-		8.9	8.5	8.2	8.5	8.4
-	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	5	6.30	26.00	15.46	15.00	7.03	0	250	MAFF 1998		15	14	16	26	6.3
7440-42-8	Boron	mg/kg	0.2	5	0.20	0.60	0.40	0.40	0.16	0	5	Nable, et al. 1997		<0.2	0.6	0.3	0.5	0.4
16065-83-1	Chromium (III)	mg/kg	1	5	11.00	47.00	23.60	19.00	14.42	0	400	MAFF 1998 (Cr(T))		11	27	14	19	47
18540-29-9	Chromium (VI)	mg/kg	1.8	5	1.80	1.80	1.80	1.80	0.00	0	25	ICRCL 70/90 1990		<1.8	<1.8	<1.8	<1.8	<1.8
7440-50-8	Copper	mg/kg	1	5	9.10	67.00	39.42	28.00	25.84	0	200	BS3882 2015		28	66	27	67	9.1
7440-02-0	Nickel	mg/kg	1	5	8.80	29.00	16.36	13.00	7.97	0	110	BS3882 2015		8.8	29	13	19	12
7440-66-6	Zinc	mg/kg	1	5	42.00	110.00	69.60	62.00	25.31	0	300	BS3882 2015		62	74	60	110	42

Legend:

MG	Made Ground
GSD	Glaciofluvial Sheet Deposits

<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
***<10**	Value excluded from statistical analysis
Y	Text result
-	Represents a determinand that was not tested.
+	represents a data point that is not included in the current filter settings

Template Version:

1.09: 11/03/24

Appendix F Waste assessment

HazWasteOnline™ assessment

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

RW15V-0K1B3-2LJ8J

Job name

24-034093_HWOL

Description/Comments

i2 lab cert: 24-034093

Project

16488

Site

8-8A St John Street

Classified by

Name:
Alison Holland
Date:
10 Sep 2024 12:17 GMT
Telephone:
01454619533

Company:
Hydrock Consultants Ltd
Hydrock Consultants, Overlane Overcourt Barns
Bristol
BS32 4DF

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	08 Sep 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

8- 8a St John Street, Manchester **Post Code** M3 4DN

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Construction of residential dwellings.

Description of the specific process, sub-process and/or activity that created the waste

Excavation arisings to be disposed offsite, generated from foundations, drainage and soft landscaping reduced level digs.

Description of the waste

Made Ground predominantly granular: blackish grey/dark grey sandy slightly ashy GRAVEL with a high cobble content of angular brick and rare fragments of ceramic
pottery. Gravel is angular to subangular, fine to coarse of limestone, granite, coal, concrete, brick and slate.
Natural- Orangish brown sandy GRAVEL or gravelly clayey SAND.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS04-1-30072024-0.50		Non Hazardous		3
2	WS02-1-30072024-0.20		Non Hazardous		6
3	WS02-2-30072024-0.80		Non Hazardous		8
4	WS02-3-30072024-1.90		Non Hazardous		10
5	WS03-1-30072024-1.00		Non Hazardous		12

Related documents

#	Name	Description
1	24-034093_HWOL.hwol	i2 Analytical .hwol file used to populate the Job
2	Hydrock Standard plus Cresol (ammended Lead)	waste stream template used to create this Job

Report

Created by: Alison Holland

Created date: 10 Sep 2024 12:17 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	15
Appendix B: Rationale for selection of metal species	16
Appendix C: Version	17

Classification of sample: WS04-1-30072024-0.50

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS04-1-30072024-0.50
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2		acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		0.11 mg/kg		0.0957 mg/kg	0.00000957 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	17.23 mg/kg	0.00172 %	✓	
5		benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
6		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.28 mg/kg		0.244 mg/kg	0.0000244 %	✓	
7		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.26 mg/kg		0.226 mg/kg	0.0000226 %	✓	
8		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.3 mg/kg		0.261 mg/kg	0.0000261 %	✓	
9		benzo[ghi]perylene		205-883-8	191-24-2		0.18 mg/kg		0.157 mg/kg	0.0000157 %	✓	
10		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.1 mg/kg		0.087 mg/kg	0.0000087 %	✓	
11		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41 mg/kg	2.775	0.99 mg/kg	0.000099 %	✓	
12		boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<**LOD**
13		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
14		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		chrysene	601-048-00-0	205-923-4	218-01-9		0.27	mg/kg		0.235	mg/kg	0.0000235 %	✓	
17		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	27.427	mg/kg	0.00274 %	✓	
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
19		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
20		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
21		fluoranthene		205-912-4	206-44-0		0.56	mg/kg		0.487	mg/kg	0.0000487 %	✓	
22		fluorene		201-695-5	86-73-7		0.06	mg/kg		0.0522	mg/kg	0.00000522 %	✓	
23		indeno[123-cd]pyrene		205-893-2	193-39-5		0.13	mg/kg		0.113	mg/kg	0.0000113 %	✓	
24		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	180	mg/kg		156.6	mg/kg	0.0157 %	✓	
25		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.4	mg/kg	1.353	0.471	mg/kg	0.0000471 %	✓	
26		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
27		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		8.8	mg/kg	1.579	12.093	mg/kg	0.00121 %	✓	
28		pH			PH		8.9	pH		8.9	pH	8.9 pH		
29		phenanthrene		201-581-5	85-01-8		0.43	mg/kg		0.374	mg/kg	0.0000374 %	✓	
30		pyrene		204-927-3	129-00-0		0.56	mg/kg		0.487	mg/kg	0.0000487 %	✓	
31		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
32		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
33		TPH (C6 to C40) petroleum group			TPH		<20	mg/kg		<20	mg/kg	<0.002 %		<LOD
34		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
35		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		62	mg/kg	1.245	67.14	mg/kg	0.00671 %	✓	
36		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
38		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		16	mg/kg	1.785	24.85	mg/kg	0.00248 %	✓	
											Total:	0.0357 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-1-30072024-0.20

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS02-1-30072024-0.20
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		0.09	mg/kg		0.0756	mg/kg	0.00000756 %	✓	
2		acenaphthylene		205-917-1	208-96-8		0.07	mg/kg		0.0588	mg/kg	0.00000588 %	✓	
3		anthracene		204-371-1	120-12-7		0.26	mg/kg		0.218	mg/kg	0.0000218 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	15.527	mg/kg	0.00155 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.74	mg/kg		0.622	mg/kg	0.0000622 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.79	mg/kg		0.664	mg/kg	0.0000664 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.1	mg/kg		0.924	mg/kg	0.0000924 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.56	mg/kg		0.47	mg/kg	0.000047 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.26	mg/kg		0.218	mg/kg	0.0000218 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.8	mg/kg	2.775	4.196	mg/kg	0.00042 %	✓	
11		boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6	mg/kg	13.43	6.769	mg/kg	0.000677 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.8	mg/kg	1.285	0.864	mg/kg	0.0000672 %	✓	
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		27	mg/kg	1.462	39.462	mg/kg	0.00395 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.69	mg/kg		0.58	mg/kg	0.000058 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				66	mg/kg	1.126	62.419	mg/kg	0.00624 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.21	mg/kg		0.176	mg/kg	0.0000176 %	✓	
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				1.4	mg/kg		1.176	mg/kg	0.000118 %	✓	
			205-912-4	206-44-0									
20		fluorene				0.09	mg/kg		0.0756	mg/kg	0.00000756 %	✓	
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.5	mg/kg		0.42	mg/kg	0.000042 %	✓	
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	90	mg/kg		75.6	mg/kg	0.00756 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.56	mg/kg		0.47	mg/kg	0.000047 %	✓	
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				29	mg/kg	1.579	38.477	mg/kg	0.00385 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
27		phenanthrene				1.1	mg/kg		0.924	mg/kg	0.0000924 %	✓	
			201-581-5	85-01-8									
28		pyrene				1.3	mg/kg		1.092	mg/kg	0.000109 %	✓	
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
30		zinc { zinc oxide }				74	mg/kg	1.245	77.371	mg/kg	0.00774 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				31	mg/kg	1.785	46.486	mg/kg	0.00465 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
										Total:	0.0383 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-2-30072024-0.80

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS02-2-30072024-0.80
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		0.09	mg/kg		0.0792	mg/kg	0.00000792 %	✓	
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3		anthracene		204-371-1	120-12-7		0.13	mg/kg		0.114	mg/kg	0.0000114 %	✓	
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16	mg/kg	1.32	18.59	mg/kg	0.00186 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.35	mg/kg		0.308	mg/kg	0.0000308 %	✓	
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.33	mg/kg		0.29	mg/kg	0.000029 %	✓	
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.53	mg/kg		0.466	mg/kg	0.0000466 %	✓	
8		benzo[ghi]perylene		205-883-8	191-24-2		0.17	mg/kg		0.15	mg/kg	0.000015 %	✓	
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.12	mg/kg		0.106	mg/kg	0.0000106 %	✓	
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.63	mg/kg	2.775	1.539	mg/kg	0.000154 %	✓	
11		boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3	mg/kg	13.43	3.546	mg/kg	0.000355 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15		chrysene	601-048-00-0	205-923-4	218-01-9		0.3	mg/kg		0.264	mg/kg	0.0000264 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27	mg/kg	1.126	26.751	mg/kg	0.00268 %	✓	
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.05	mg/kg		0.044	mg/kg	0.0000044 %	✓	
19		fluoranthene		205-912-4	206-44-0		0.87	mg/kg		0.766	mg/kg	0.0000766 %	✓	
20		fluorene		201-695-5	86-73-7		0.05	mg/kg		0.044	mg/kg	0.0000044 %	✓	
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.16	mg/kg		0.141	mg/kg	0.0000141 %	✓	
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	88	mg/kg		77.44	mg/kg	0.00774 %	✓	
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.4	mg/kg	1.353	0.476	mg/kg	0.0000476 %	✓	
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.06	mg/kg		0.0528	mg/kg	0.00000528 %	✓	
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		13	mg/kg	1.579	18.069	mg/kg	0.00181 %	✓	
26		pH			PH		8.2	pH		8.2	pH	8.2 pH		
27		phenanthrene		201-581-5	85-01-8		0.73	mg/kg		0.642	mg/kg	0.0000642 %	✓	
28		pyrene		204-927-3	129-00-0		0.77	mg/kg		0.678	mg/kg	0.0000678 %	✓	
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		60	mg/kg	1.245	65.721	mg/kg	0.00657 %	✓	
31		monohydric phenols			P1186		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
32		vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		25	mg/kg	1.785	39.274	mg/kg	0.00393 %	✓	
											Total:	0.0284 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02-3-30072024-1.90

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS02-3-30072024-1.90
Moisture content:
4.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 4.7% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2		acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3		anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.3	mg/kg	1.32	7.927	mg/kg	0.000793 %	✓	
5		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8		benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10		beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.44	mg/kg	2.775	1.164	mg/kg	0.000116 %	✓	
11		boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.4	mg/kg	13.43	5.12	mg/kg	0.000512 %	✓	
12		cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.3	mg/kg	1.285	0.367	mg/kg	0.0000286 %	✓	
13		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		47	mg/kg	1.462	68.693	mg/kg	0.00687 %		
14		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15		chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				9.1	mg/kg	1.126	9.764	mg/kg	0.000976 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	8.8	mg/kg		8.386	mg/kg	0.000839 %	✓	
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.063	mg/kg	0.00181 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.4	pH		8.4	pH	8.4 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-581-5	85-01-8									
28		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			204-927-3	129-00-0									
29		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
		034-002-00-8											
30		zinc { zinc oxide }				42	mg/kg	1.245	49.821	mg/kg	0.00498 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
31		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
				P1186									
32		vanadium { divanadium pentaoxide; vanadium pentoxide }				14	mg/kg	1.785	23.818	mg/kg	0.00238 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
33		magnesium { magnesium phosphide; trimagnesium diphosphide }				<5	mg/kg	1.85	<9.248	mg/kg	<0.000925 %		<LOD
		015-005-00-3	235-023-7	12057-74-8									
										Total:	0.0211 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS03-1-30072024-1.00

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:
WS03-1-30072024-1.00
Moisture content:
14%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.37 mg/kg		0.318 mg/kg	0.0000318 %	✓	
2	acenaphthylene		205-917-1	208-96-8		0.18 mg/kg		0.155 mg/kg	0.0000155 %	✓	
3	anthracene		204-371-1	120-12-7		0.76 mg/kg		0.654 mg/kg	0.0000654 %	✓	
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		26 mg/kg	1.32	29.522 mg/kg	0.00295 %	✓	
5	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
6	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.7 mg/kg		1.462 mg/kg	0.000146 %	✓	
7	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2 mg/kg		1.72 mg/kg	0.000172 %	✓	
8	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.8 mg/kg		2.408 mg/kg	0.000241 %	✓	
9	benzo[ghi]perylene		205-883-8	191-24-2		1.3 mg/kg		1.118 mg/kg	0.000112 %	✓	
10	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.73 mg/kg		0.628 mg/kg	0.0000628 %	✓	
11	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.93 mg/kg	2.775	2.22 mg/kg	0.000222 %	✓	
12	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	5.775 mg/kg	0.000577 %	✓	
13	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		chrysene				1.7	mg/kg		1.462	mg/kg	0.000146 %	✓	
		601-048-00-0	205-923-4	218-01-9									
17		copper { dicopper oxide; copper (I) oxide }				67	mg/kg	1.126	64.874	mg/kg	0.00649 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
18		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
19		dibenz[a,h]anthracene				0.29	mg/kg		0.249	mg/kg	0.0000249 %	✓	
		601-041-00-2	200-181-8	53-70-3									
20		ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
21		fluoranthene				3.7	mg/kg		3.182	mg/kg	0.000318 %	✓	
			205-912-4	206-44-0									
22		fluorene				0.28	mg/kg		0.241	mg/kg	0.0000241 %	✓	
			201-695-5	86-73-7									
23		indeno[123-cd]pyrene				1	mg/kg		0.86	mg/kg	0.000086 %	✓	
			205-893-2	193-39-5									
24		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	190	mg/kg		163.4	mg/kg	0.0163 %	✓	
		082-001-00-6											
25		mercury { mercury dichloride }				1.5	mg/kg	1.353	1.746	mg/kg	0.000175 %	✓	
		080-010-00-X	231-299-8	7487-94-7									
26		naphthalene				0.4	mg/kg		0.344	mg/kg	0.0000344 %	✓	
		601-052-00-2	202-049-5	91-20-3									
27		nickel { nickel dihydroxide }				19	mg/kg	1.579	25.809	mg/kg	0.00258 %	✓	
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
28		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
29		phenanthrene				3	mg/kg		2.58	mg/kg	0.000258 %	✓	
			201-581-5	85-01-8									
30		pyrene				3.3	mg/kg		2.838	mg/kg	0.000284 %	✓	
			204-927-3	129-00-0									
31		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<**LOD**
		034-002-00-8											
32		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
33		TPH (C6 to C40) petroleum group				50	mg/kg		43	mg/kg	0.0043 %	✓	
				TPH									
34		xylene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
35		zinc { zinc oxide }				110	mg/kg	1.245	117.75	mg/kg	0.0118 %	✓	
		030-013-00-7	215-222-5	1314-13-2									
36		monohydric phenols				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
				P1186									
37		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
38		vanadium { divanadium pentaoxide; vanadium pentoxide }				26	mg/kg	1.785	39.917	mg/kg	0.00399 %	✓	
		023-001-00-8	215-239-8	1314-62-1									
39		magnesium { magnesium phosphide; trimagnesium diphosphide }				6.3	mg/kg	1.85	10.021	mg/kg	0.001 %	✓	
		015-005-00-3	235-023-7	12057-74-8									

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
								Total:	0.056 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 1000 mg/kg (0.1%) because: Flammability of soils due to TPH is likely to be in the region of 10,000mg/kg. Anything below 1000mg/kg is unlikely to be flammable and is therefore considered non-hazardous.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0043%)

Appendix A: Classifier defined and non GB MCL determinands

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

boron tribromide/trichloride/trifluoride (combined) (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 06 Aug 2015
Hazard Statements: EUH014 , Acute Tox. 2; H330 , Acute Tox. 2; H300 , Skin Corr. 1A; H314 , Skin Corr. 1B; H314

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

lead compounds with the exception of those specified elsewhere in this Annex

GB MCL index number: 082-001-00-6
Description/Comments: Least-worst case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers many simple lead compounds to be Carcinogenic category 2
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html. Review date 29/09/2015

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

monohydric phenols (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 <= conc. < 3 % , Eye Irrit. 2; H319 1 <= conc. < 3 % , Aquatic Chronic 2; H411

magnesium phosphide; trimagnesium diphosphide (EC Number: 235-023-7, CAS Number: 12057-74-8)

GB MCL index number: 015-005-00-3
Description/Comments:
Additional Hazard Statement(s): Water-react. 1; H260 >= 0.3 % , EUH032 >= 0.3 % , EUH029 >= 0.3 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - Water-react. 1; H260 >= 0.3 % hazard statement sourced from: WM3, Table C3.2
20 Nov 2021 - EUH032 >= 0.3 % hazard statement sourced from: WM3, Table C12.2
20 Nov 2021 - EUH029 >= 0.3 % hazard statement sourced from: WM3, Table C12.2

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

beryllium {beryllium oxide}

Worst case species based on hazard statements

boron {boron tribromide/trichloride/trifluoride (combined)}

Worst case species based on hazard statements

cadmium {cadmium sulfide}
Worst case species based on hazard statements
chromium in chromium(III) compounds {chromium(III) oxide (worst case)}
Worst case species based on hazard statements
chromium in chromium(VI) compounds {chromium(VI) oxide}
Worst case species based on hazard statements
copper {dicopper oxide; copper (I) oxide}
Most likely common species
cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}
Worst case species
lead {lead compounds with the exception of those specified elsewhere in this Annex}
Worst case species based on hazard statements
mercury {mercury dichloride}
Worst case species based on hazard statements
nickel {nickel dihydroxide}
Worst case species based on hazard statements
selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}
Worst case species based on hazard statements
zinc {zinc oxide}
Worst case species based on hazard statements
vanadium {divanadium pentaoxide; vanadium pentoxide}
Worst case species based on hazard statements.
magnesium {magnesium phosphide; trimagnesium diphosphide}
Worst case species based on hazard statements.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2024.253.6227.11428 (09 Sep 2024)
HazWasteOnline Database: 2024.253.6227.11428 (09 Sep 2024)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021
GB MCL List v2.0 - version 2.0 of 20th October 2023
GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024
GB MCL List v5.0 - version 5.0 of 26th June 2024

Appendix G Preliminary geotechnical risk register

Geotechnical Hazard Identification – Following Ground Investigation

The preliminary Geotechnical Risk Register following Ground Investigation is set out in Table G3.

The probability and impact of a hazard have been judged on a qualitative scale as set out in Table G.2. The degree of risk (R) is determined by combining tan assessment of the probability (P) of the hazard occurring with an assessment of the impact (I) of the hazard and associated mitigation it will require if it occurs (R = P x I).

Table J.2: Qualitative assessment of hazards and risks

P = Probability		I = Impact		R = Risk Rating (P x I)	
1	Very unlikely (VU)	1	Very Low	1 – 4	None / negligible
2	Unlikely (U)	2	Low	5 – 9	Minor
3	Plausible (P)	3	Medium	10 – 14	Moderate
4	Likely (Lk)	4	High	15 – 19	Substantial
5	Very Likely (VLk)	5	Very High	20 - 25	Severe

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Uncontrolled Made Ground (variable strength and density).	Made Ground is present across the site between 1.5m and >2.3m bgl, associated with backfilled basements, and associated with construction of the existing basement.	Residential Dwellings or extension.	Bearing capacity failure, settlement (total and differential).	3	4	12	Design foundations to found below Made Ground and into the Glaciofluvial Deposits or Chester Formation subject to completion of additional ground investigation.
			Floor slab failure.	3	4	12	Design floor slabs as suspended.
		Services.	Settlement (differential), causing damage to services.	2	2	4	It is unlikely that settlements will be significant with respect to services.
		Gardens.	Settlement (differential), in gardens.	2	2	4	It is unlikely that settlements will be significant with regard to gardens.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavation and replacement with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Variable lateral and vertical changes in ground conditions.	The Made Ground soils vary laterally and vertically, both in composition, density, or strength.	Residential Dwellings.	Foundation bearing capacity failure, settlement (total and differential).	3	4	12	Design foundations to found below Made Ground and into the Glaciofluvial Deposits or Chester Formation subject to completion of additional ground investigation.
			Floor slab failure.	3	4	12	Design floor slab as suspended.
		Services.	Settlement (differential), causing damage to services.	2	2	4	It is unlikely that settlements will be significant with respect to services.
		Gardens.	Settlement (differential), in gardens.	2	2	4	It is unlikely that settlements will be significant with regard to gardens.
		Construction staff, vehicles, and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavation and replacement with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Obstructions.	In the east of the site a subsurface concrete slab is present at 1.5m associated with backfilled basements.	Residential Dwellings.	Impact on foundations	4	3	12	Allow for a breaker to be present during construction and remove obstructions where encountered during construction.
Existing below ground structures to remain (basement of 8-8a St John Street).	There is an existing basement immediately adjacent to the proposed extension in the north west side of 8-8a St John Street	Adjacent Basement	Foundation bearing capacity failure, settlement (differential).	4	4	16	Undertake geotechnical design to ensure the proposed structures do not place additional lateral load on the existing basement Design to be undertaken in accordance with EC7. Contractor to appoint competent Temporary Works Designer to design temporary works, in accordance with BS 5975:2008+A1:2011. Temporary Works Design to include recommendations for inspection of excavations. No person entry to unsupported excavations.
Loose Made Ground, leading to difficulty with excavation and collapse of side walls.	The ground investigation has indicated that there is a potential for loose soils and Made Ground to be present at the site.	Construction staff, vehicles, and plant operators.	Ground failure, instability of plant and machinery.	3	4	12	As instability has been noted in all pits from surface, foundation options should be reviewed to ensure minimal excavation (e.g. piles). Contractor to appoint competent Temporary Works Designer to design temporary works, in accordance with BS 5975:2008+A1:2011. Temporary Works Design to include recommendations for inspection of excavations. No person entry to unsupported excavations.
			Risk of collapse of excavation.	3	4	12	
Unforeseen ground conditions - risk associated with limited data.	Preliminary Ground investigation has been undertaken. However, additional information will be obtained during construction. Ground conditions are only defined at exploratory hole locations.	All aspects of the development		3	4	12	Designers to be contacted if conditions encountered are different to those identified during investigation. Regular inspections of excavations and earthworks for evidence of stability. Adequate investigation required to characterise the site and understand the potential risks.

Whilst the probability and impact of the hazard occurring can be reduced to a minimum by geotechnical design, the impact cannot be reduced below very low. The risk register will need to be up-dated, as necessary, to reflect design, additional information, data, and experience as it is gained through the construction process.

Appendix H Plausible source-pathway-receptor

Summary of potential contaminant linkages

Table H.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2023) and additional risk assessment is required.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but modified to add a 'no linkage' category and to remove low/moderate risk (See Table H.1).

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table H.1: Consequence versus probability assessment.

		Consequence			
Probability		Severe	Medium	Mild	Minor
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

Table H.2: Exposure model – final source-pathway-receptor contaminant linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Asbestos within existing buildings	Fugitive dust.	Site users or neighbours	Low likelihood	Severe	Moderate	An Asbestos refurbishment survey should be completed on 8-8a St John Street. Careful removal or management will be required prior to refurbishment of the existing 8-8a St John Street. Removal under controlled conditions by a competent asbestos removal specialist will limit the release of any fibres present to the air. Via careful removal and use of control measures in accordance with CAR2012 the risk posed to receptors would be reduced to low.