



**BROWNFIELD
SOLUTIONS LTD**

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

MORGAN SINDALL

Star Academy, Radcliffe

Phase II Geo-Environmental Assessment Report

PH/C5394/12387

October 2023

Document Ref: FS1013-BSL-XX-XX-T-O-1000

Revision: P01

EXECUTIVE SUMMARY																																					
Location and Brief Site Description	The site is located off Spring Lane, Radcliffe, M26 2SZ. It is situated approximately 0.5 km north of Radcliffe Town Centre, centred on National Grid Reference 378700, 407630. The site currently consists of a school and leisure centre in the south-east of the site, with the north-west being occupied by a disused playing field.																																				
Ground Conditions	Generalised ground conditions from the BSL ground investigation comprise (top down): - Made ground generally comprising sandy gravelly clay and gravelly sand from ground level to between 0.15m and 2.00m bgl. - Natural superficial deposits comprising sandy gravelly clay, clayey gravelly sand and sandy gravel proven to depths between 1.20m and 20.50m bgl. - Solid geology comprising mudstone, siltstone and sandstone proven to depths of 45.00m bgl. - Groundwater levels ranging between 0.80m and 3.00m bgl during site works. - Post site works monitoring levels ranging between 0.60m and 6.08m bgl.																																				
Human Health - Soils Contamination	Testing on soils and comparison against the relevant screening criteria has revealed: Exceedances of PAHs and heavy metals within made ground soils. The above pose a risk to human health and require mitigation.																																				
Controlled Waters – Surface and Groundwater Contamination	The following have been identified: Exceedances of heavy metals, PAHs and a singular minor exceedance of petroleum hydrocarbons have been detected as part of the testing undertaken by Geotechnics. However, based on the assessments carried out, the risk to controlled waters is considered to be low and no further action is required.																																				
Ground Gas	Based on the monitoring, the site is classified as CS1 with no protection required, subject to the removal of the organic made ground material encountered locally within the vicinity of WS101 in the building footprint, during the earthworks programme. No radon protection is required.																																				
Outline Remedial Strategy	Subject to regulatory approval, the following outline remedial strategy is recommended: - Cover system with 450mm thick of ‘clean’ validated topsoil/subsoil in soft landscaping areas. - Verification of the above with validation reports produced.																																				
Waste	One sample of made ground from WS106 has been classified as Hazardous due to pH level. However, the remainder of the made ground and natural soils have been classified as non-hazardous. The granular ashy made ground prevalent in the eastern areas is likely to be accepted at a non-hazardous landfill site, whereas the cohesive made ground is likely to be accepted at an inert landfill site.																																				
Foundations and Floor Slabs	Ground improvement by methods such as vibro ground improvement and/or vibro stone columns (VSCs) is considered suitable for structures. Reinforced pad and strip foundations could be used bearing onto the improved ground, at depths of circa 600mm bgl. Allowable bearing capacities of the order of 150kN/m² can typically be achieved. Alternatively, a piled solution may be adopted, with the piles extending through the made ground and superficial deposits, utilising a combination of skin friction and end-bearing resistance. The profiles below have been split into different options dependant on the depth to rockhead which varies across the building footprint.																																				
	<table><tr><th>Profile</th><th>Pile Diameter (mm)</th><th>Pile Length (m)</th><th>Allowable Load (kN)</th></tr><tr><td rowspan="3">RO102, BH03A, RO105, RO106, BH04</td><td>300</td><td>14.00</td><td>430</td></tr><tr><td>500</td><td>14.00^[1]</td><td>840</td></tr><tr><td>750</td><td>14.00^[1]</td><td>1450</td></tr><tr><td rowspan="3">RO103, RO104, RO107</td><td>300</td><td>18.50</td><td>490</td></tr><tr><td>500</td><td>18.50^[1]</td><td>940</td></tr><tr><td>750</td><td>18.50^[1]</td><td>1600</td></tr><tr><td rowspan="3">RO101, RO108, BH02</td><td>300</td><td>22.00</td><td>560</td></tr><tr><td>500</td><td>22.00^[1]</td><td>1050</td></tr><tr><td>750</td><td>22.00^[1]</td><td>1800</td></tr></table>			Profile	Pile Diameter (mm)	Pile Length (m)	Allowable Load (kN)	RO102, BH03A, RO105, RO106, BH04	300	14.00	430	500	14.00 ^[1]	840	750	14.00 ^[1]	1450	RO103, RO104, RO107	300	18.50	490	500	18.50 ^[1]	940	750	18.50 ^[1]	1600	RO101, RO108, BH02	300	22.00	560	500	22.00 ^[1]	1050	750	22.00 ^[1]	1800
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	Suspended floor slabs supported by piles or ground bearing floor slabs onto improved ground may be adopted.																																				
	Concrete Classification	DS1 AC-2s conditions prevail in the made ground. DS1 AC-1 conditions prevail in the natural superficial strata.																																			

EXECUTIVE SUMMARY

Highways Design	Made Ground CBR – 2% Superficial Strata CBR – cohesive/fine soils – 2% Superficial Strata CBR – granular/coarse soils – 5% The above should be confirmed by in-situ testing at formation level by a specialist geotechnical engineer during construction.
Drainage	Drainage to soakaways is unlikely to be suitable for this site due to the high groundwater table.
Mining Risk	The risk from shallow unrecorded mine workings is considered to be low and treatment by drilling and grouting is not required. Geogrid installation would be prudent within external areas, such as car parking, located in the Coal Authority Development High Risk Area where borehole coverage is limited.
Further Work	The following further works will be required to progress to the construction phase: • Demolition Asbestos survey. • Tree survey by qualified arboriculturist. • Detailed foundation design by a structural engineer. • Production of Earthworks Specification. • Design of Remedial Strategy and confirmation with the Local Authority / EA. • Production of Materials Management Plan (MMP) under the CL:AIRE DoWCoP, if required. • Implementation of the Earthworks Specification, Remedial Strategy and verification of the works.

This executive summary should be read in conjunction with the full report, reference PH/C5394/12387 and not as a standalone document. Report template version 4.2.

PROJECT QUALITY CONTROL DATA SHEET

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DRAWINGS		
Drawing Number	Rev	Title
FS1013-REN-XX-XX-D-CS-5100-P02	P02	Site Constraints Plan
C5394/01	-	Site Location Plan
C5394/02	-	Exploratory Hole Location Plan
C5394/02A	-	Exploratory Hole Location Plan
C5394/03	-	Coal Authority Interactive Map Extract
C5394/04	-	Geological Map Extract
C5394/05	-	Proposed Development Footprint Bedrock Profile
C5394/06	-	Site Features Plan

APPENDICES	
Appendix	Title
Appendix A	BSL Methodology and Guidance
Appendix B	Exploratory Hole Logs
Appendix C	Chemical Testing Results
Appendix D	Geotechnical Testing Results
Appendix E	Monitoring Results
Appendix F	Waste Assessment Report
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1.0 INTRODUCTION

1.1 Context

This report describes a Phase II Geo-Environmental Assessment carried out by Brownfield Solutions Limited (BSL) for Morgan Sindall as instructed by the Department of Education on a site off Spring Lane, Radcliffe and has been completed in general accordance with the following guidance:

- Environment Agency guidance - Land Contamination: Risk Management (LCRM).
- BS 10175:2011+A2:2017 Investigation of Potentially Contaminated Sites.
- BS5930: 2015+A1:2020 Code of Practice for Ground Investigations.
- BS EN 1997-1:2004+A1:2013 Eurocode 7. Geotechnical design. General rules plus UK National Annex.
- BS EN 1997-2:2007 Eurocode 7 Geotechnical design. Ground investigation and testing plus UK National Annex.

Definitions of terms and acronyms used within this report is presented in Section 11.0.

1.2 Proposed Development

The proposed development involves the construction of a 'super teaching block' with a sports hall annexe and extensive MUGA / Sports Pitches as shown on the Site Constraints Plan, drawing No. FS1013-REN-XX-XX-D-CS-5100-P02 provided to BSL by Renaissance Associates Ltd.

1.3 Previous Reports

The following reports have been produced for the site and should be read in conjunction with this assessment (in date order):

- Geotechnics, Desk Study Report, reference PC228400, dated May 2022.
- Geotechnics, Preliminary Ground Investigation Report with Interpretive Chapter, reference PN224390, dated August 2022.
- BSL Coal Mining Risk Assessment, ref: PH/C5394/12312, issued August 2023.

BSL understand that the client has reliance on the above reports and we have assumed reliance is or will be obtained prior to detailed design and that the information provided in the above reports is reliable and representative of the ground conditions and is used in good faith within this assessment.

1.4 Objectives and Scope

The objectives of this report are to determine the geo-environmental setting and ground conditions of the site, highlighting potential risks and areas of concern that may govern the development under the current planning regime.

This report has been produced in general accordance with the recommendations for a Tier 2 Generic Quantitative Risk Assessment as described in LCRM guidance. This assessment is also intended to fulfil the requirements of a Ground Investigation Report (GIR) as detailed in BS EN 1997-2:2007.

Following and Coal Mining Risk Assessment (CMRA) and previous Phase II Investigation undertaken by Geotechnics, a supplementary intrusive investigation was undertaken to confirm the findings of the preliminary CSM and risk assessment and meet any objectives that had not been satisfied. The exploratory investigation was undertaken using trial pitting, window sampling, rotary drilling, gas and groundwater monitoring, laboratory chemical and geotechnical testing, with reporting on the findings.

1.5 Limitations

This assessment has been prepared in accordance with the relevant current legislative framework, guidance and risk assessment methodology as outlined in Appendix A. BSL is not liable for any subsequent changes in the guidance and legislation.

The findings and opinions conveyed via this report are based on information obtained from a number of sources as detailed within this report, BSL have assumed this information is correct and reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

BSL have used reasonable skill, care and diligence for the investigation of the site and the production of this report. There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore have not been considered by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

This report has been prepared for the sole use and reliance of the Client, Morgan Sindall. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report, they rely on it at their own risk and BSL do not owe them any Duty of Care.

The investigation carried out on the site has been conducted to provide the best information on the ground conditions within site access and budgetary constraints. The inherent variation of ground conditions allows only for definition of the actual conditions at the locations and depths of exploratory locations at the time of the investigation. Different ground conditions may exist that have not been identified within this investigation.

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

The groundwater results described are only representative of the dates on which they were recorded, and levels may vary seasonally (e.g. due to changes in weather).

This assessment has been based on the proposed planning layouts provided. Any subsequent change to the planning layout may have an impact on the validity of recommendations made within this report. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

Although every effort has been made to position exploratory holes in the least sensitive areas of the site, exploratory hole positions were located approximately as part of this investigation and no guarantee can be given as to their accuracy. Consideration should be given to the possibility that exploratory holes excavated as part of this investigation and indeed any previous ground investigation work by others may be encountered beneath or within the influence of individual foundations. BSL cannot be held responsible for structural failures caused by the location of foundations of any form of structure within the influence of exploratory holes.

Where it has not been possible to reasonably use an EC7 compliant investigation technique, a practical alternative has been adopted to obtain indicative soil parameters and any interpretation is based upon engineering experience, local precedent where applicable and relevant published information.

The chemical testing carried out for this report was not scoped to comply with the requirements of the water supply company and further work may be required, unless otherwise stated.

Notwithstanding site observations concerning the presence or otherwise of archaeological issues, asbestos-containing materials (ACM) or invasive weeds (e.g. Japanese knotweed), this report does not constitute a formal survey of these potential issues.

The site plans enclosed in this report should not be scaled off. Any site boundary line depicted on plans does not imply legal ownership of land.

Any recommendations made in this report should be confirmed with the Regulatory Authorities prior to implementation to ensure compliance.

2.0 THE SITE

2.1 Location

The site is located off Spring Lane, Radcliffe, M26 2SZ. It is situated approximately 0.5 km north of Radcliffe Town Centre, centred on National Grid Reference 378700, 407630 as shown on the Site Location Plan, Drawing No. C5394/01.

2.2 Site Description

The main site features and potential issues identified are detailed below and are shown on the Site Features Plan, Drawing No. C5394/06:

Feature	Description
Site Area	The site covers approximately 6.4 hectares.
Site Access	Access to the site is gained off Spring Lane to the south.
Current Land Use and Site Features	The north section of the site consists of an overgrown playing field and a sports court surfaced in hardstanding in the north-easternmost section. The lower south section of the site is comprised of a secondary school (Spring Lane School) and leisure centre (Radcliffe Leisure Centre) with associated hardstanding car parking areas. A public footpath runs along the south-west border of the site (Banana Path). There are several manholes and services present in the proximity of the secondary school and leisure centre. Service plans provided by the client also show an intermediate pressure gas main trending north-south across the derelict playing field. Multiple services are also shown to be present within the area of the old sports courts / new car parking areas in the north-east section of the site.
Potential Mining Related Features	No potential mining related features have been observed onsite.
Potential Sources of Gross Contamination	Potential sources of gross contamination included the boiler house associated with the school development. There is also a chimney associated with the boiler house, although BSL understand this is disused and new gas boilers were installed in 2015 and 2019 for the school and leisure centre.
Vegetation	Mature / semi-mature trees are present along the north and east borders of the site. Small clusters of trees are also present near the entrance to the site off Spring Lane, to the west of the school / leisure centre building and in the far north-west corner of the site. A wooded area is also present to the west of the school building.
Topography	The site generally appears to gently slope to the south-east. A slope is present between the field in the west and the school car parks in the east and has a change of 2m elevation. Based on currently provided topography plans, there is a 7m different between the east and west extents of the site.
Site Boundaries	The site is enclosed by steel palisade fencing along the eastern border of the site, a wooded area to the north of the site, steel railings to the west and Spring Lane to the south.
Surrounding Area	The site is set within a mixed commercial and residential area, with a park and ride car park present to the south, residential properties to the west, a railway to the east, the disused Manchester Bolton and Bury Canal to the north-west and a wooded area to the north.

3.0 SUMMARY OF PREVIOUS REPORTS

3.1 Geotechnics Desk Study Report

A summary of the relevant points from the Desk Study completed by Geotechnics (reference PC228400) is presented below:

- The site has been shown to have been developed from 1850, with a railway track transversing through the centre of the site. The site's features are generally related to railway development with associated goods yards and sidings, present until 1978. From 1987 a school is present onsite with associated playing fields and infrastructure.
- Mining has been evident on the historical maps from 1850 with a colliery (Whittaker's Bridge Colliery) being present from 1891 to 1909, 60m NW of the site.
- Superficial geology comprises glacial till (Secondary Undifferentiated Aquifer) comprising clay to sandy clay, unsorted, with common pebbles, cobbles and some boulders (Diamicton) is located within the northwest half of the site. In the southeast half of the site superficial deposits are shown to comprise Glaciofluvial Deposits described as undifferentiated sand and gravel with lenses of clay and stony clay.
- Solid geology is shown to be Upper Carboniferous (Pennsylvanian) (Secondary A Aquifer) strata of the Pennine Middle Coal Measures Formation which are described as mudstone and siltstone interbedded with fine- to medium grained sandstone, subordinate seatearths, marine bands and coal seams. The strata forms part of the Duckmantian (Westphalian B) Series.
- The site is not indicated to lie within a Source Protection Zone.
- Geological mapping show two coal seams are outcropping across the site from northeast to southwest.
- Geological mapping also shows another older coal seam outcropping with a similar strike is shown north of the Manchester, Bolton and Bury Canal. It is expected this seam runs below the site at depth.
- The site is in an area where the Coal Authority shows the site could be affected by past coal mining.
- A Coal Authority search carried out shows several coal seams are recorded to have been worked below the site.
- The nearest watercourse is the Manchester, Bolton and Bury Canal, 4m to the north.
- The site lies in an area with potential for groundwater flooding to occur at the surface.
- No radon protection measures are required.
- The risk to human health is considered to be medium to low.
- The risk to controlled waters is medium.
- The risk from ground gas is high to medium.

3.2 Geotechnics Preliminary Ground Investigation Report with Interpretive Chapter

A summary of the relevant points from the Preliminary Ground Investigation Report with Interpretive Chapter completed by Geotechnics (reference PN224390) is presented below:

- 5 No. Hand dug trial pits were excavated ranging in depths from 0.60m (HP02) and 1.20m BGL (HP05).
- 6.No Machine dug trail pits were excavated to 4.00m bgl.
- 3.No Soakaways (SA01 – SA03) tests were carried out within TP01 – TP03. SA01 and SA02 were carried out in adjacent pits to TP01 an TP02.
- 7 No. Dynamic Sample Boreholes (DS01 – DS07) were undertaken to depths between 3.45m to 5.45m bgl.
- 5 No. cable percussive boreholes with rotary follow-on boreholes (BH1 to BH4 including BH03A) to depth of between 2.45m and 51.50m bgl.
- Dynamic Cone Penetration Tests were carried out at 14 No. locations.
- 5 No. boreholes were installed for ground gas and groundwater monitoring.
- Made ground encountered included hardstanding of macadam, concrete, cobble setts and limestone gravel (sub base) from ground level to 0.10m to depths of 0.05m to 0.30m bgl.
- Topsoil was encountered from ground level to between 0.10m and 0.50m bgl.

- Granular made ground of sandy gravel was encountered across the majority of the eastern half of the site and north east from ground level to 0.30m bgl with thicknesses ranging from 0.40m to 2.60m.
- Cohesive made ground typically a sandy gravelly clay encountered from ground level to 0.30m bgl with a thickness of 0.30m to 1.70m.
- Glacial sand and gravels encountered were encountered from 0.10m to 2.80m bgl. Thickness from 0.20m to 3.90m were recorded.
- Glacial laminated clay was encountered in the upper, north-western part of the site only. This strata is described as slightly sandy clay with lenses of sand. This strata was encountered at 3.30m bgl to a depth of 3.50m bgl.
- Glacial till comprising of a slightly sandy slightly gravelly clay was encountered from 0.25m to 4.00m bgl. Thickness ranged between 0.10m and 18.70m.
- Pennine Middle Coal Measures consisting of mudstone, siltstone and sandstone. This geological unit was encountered from 12.60 to 20.50m. Coal was encountered between 16.40m and 48.00m bgl.
- Groundwater strikes were encountered in exploratory holes BH01, BH02, BH03A, BH04, DS01 – DS06, TP01-TP02 and TP05-TP06. Depths ranged from 1.30m – 14.30m bgl.
- SPT results generally showed the granular made ground, glacial sand and gravel to be medium dense. Glacial Till was shown to be generally stiff to very stiff in nature. Variation of refusal depths indicate the likely presence of cobbles and boulders within Glacial Till.
- Exceedances in heavy metals and PAHs were recorded within the soils chemical testing.
- Several exceedances of EQS and DWS of heavy metals, TPH and PAH were detected within groundwater and leachate testing.
- Piled foundations into very stiff / stiff Glacial Till or socketed into the Pennine Middle Coal Measure are considered the most suitable for the predicted loads.
- Tree influence is anticipated to be an issue due to the effects of shrinking or swelling of clays on site. Suitable engineering strategies such as the use of a void or compressible material below ground beams / suspended floor slabs.
- The Design Sulphate Class for the site is DS-1 and ACEC Class AC-2z.
- CBR values of 3% should be adopted. Ground improvement strategies are recommended in potentially weakened zones.
- No significant risk to controlled water receptors were identified.
- No significant risk to human health receptors were identified.
- No significant sources of ground gas from the made ground or from underlying coal bearing bedrock or potential mine workings was identified.

3.3 BSL Coal Mining Risk Assessment

A summary of the relevant points from the CMRA (ref. PH/C5394/12312, dated August 2023) completed by BSL is presented below:

- The site is located within an area where coal seams are abundant and parts of the site are located within a development high risk zone.
- The site lies within a fault block, strike-slip faults lie to the north and south of the site.
- Two coal seams are recorded to subcrop onsite.
- The dip of the coal seams range from 9° to 24° within the area around the site.
- 11 named coal seams are recorded beneath the site, with a total of 7 seams historically worked according to the Coal Authority Consultants' Mining Report.
- Geological memoir records and the Consultants Mining Report indicate the seams range in thickness from 0.80m to 4.60m.
- The recorded workings are considered to present a low risk to the site due to the depth of workings presented in the Coal Authority report, supported by abandonment plans and outcrop calculations.
- Due to the sub-cropping coal seams being indicated to be of workable thickness from coal memoir records, the risk from unrecorded mine entries is considered to be moderate.
- As there are coal seams indicated to be dipping below the site at a shallow depth and are of workable thickness, the risk from unrecorded mine working is considered to be high.

-
- The risk from recorded mine entries is considered to be low – no recorded mine entries are located on site, the closest being located approximately 40m east and 85m west of the site.
 - The risk from mine gas is considered to be moderate.
 - The risk from Coal Mining Geology is considered to be low.
 - The risk from coal mining surface hazards is considered to be low.
 - The risk from opencast mining is considered to be low.
 - Recommendations were for a series of rotary openholes to drilled to depth of 30m to 40m across the site to confirm or otherwise the presence of the coal seams or workings.
 - If evidence of potential influence from mine entries or coal workings is identified during construction, BSL should be consulted.
-

4.0 METHOD OF INVESTIGATION

4.1 Objectives

To confirm the risks to the identified receptors and confirm the ground conditions in respect to the identified geotechnical and geo-environmental risks, an appropriate intrusive investigation was undertaken following the ground investigation undertaken by Geotechnics.

The aim of the fieldwork was to:

- Investigate ground conditions on the site and the potential need for detailed investigation.
- Further investigate the ground conditions on site.
- Install standpipes to allow future monitoring.
- Assess the potential contamination on the site and obtain samples for contamination screening.
- Assess the potential impact of any contamination on controlled waters.
- Obtain geotechnical information on the ground conditions at the site for preliminary foundation design and preliminary pavement design purposes.
- Give an assessment of the geo-environmental risks associated with redevelopment of the site.
- Assess the potential for instability caused by historical coal extraction.

4.2 Site Works

The following site works have been undertaken as part of the intrusive investigation between the dates of 7th and 15th August 2023.

Method	No.	Range Depths (m bgl)	Purpose
Trial pits – JCB 3CX	11	1.50 – 3.50	Establish general ground conditions and gain good coverage.
Window sample boreholes – Tracked WS rig	6	1.20 – 5.45	Establish general ground conditions on site. Allow Standard Penetration Tests (SPTs) to be carried out and obtain samples for contamination and geotechnical and testing. Installation of ground gas and water monitoring wells. WS103 positioned to further investigate hydrocarbon odour and oily sheen noted in BH03 during the Geotechnics Investigation.
Rotary open boreholes	8	45.00	Investigate the presence and depths of coal seams and potential mine workings.
Hand excavated pits	2	1.10 – 1.20	Establish general ground conditions and gain good coverage.

The surveyed locations of the exploratory holes are indicated on the Exploratory Hole Location Plan, Drawing No C5394/02 & C5394/02A. The exploratory hole logs are presented in Appendix B.

RO102 and TP110 were moved 5.00m to the east of their original positions due to the intermediate pressure gas main running through the west section of the site.

TP111 was also relocated due to restricted access to the wooded area to the west of the school building. An additional hand pit (HP102) was placed within the road present along the west side of the school building to gain coverage as close to the original positions as possible.

TP103, TP104, TP105, RO107, WS103 & TP109 were moved due to being within the area of the slope between the school car parks and the field in the west.

The exploratory holes were logged by an experienced geo-environmental engineer in general accordance with the following guidance:

- BS 5930:2015+A1:2020 Code of Practice for Site Investigations.
- BS EN 14688-1:2018 Geotechnical Investigation and Testing – Identification and classification of soil.

4.3 Sampling Strategy

Representative samples were taken from exploratory holes at regular intervals to assist in the identification of the soils and to allow subsequent laboratory testing. They were stored and transported in general accordance with BS 10175:2011+A2:2017.

The type of sample was dependent upon the stratum and the purpose of analysis in accordance with current environmental and geotechnical guidance. The distribution of samples taken across the site is recorded on the exploratory logs.

Investigatory hole locations were determined by reference to the conditions identified in the preliminary risk assessment. Certain specific areas such as the proposed building footprint were targeted for detailed investigation, but a reasonably even spacing was used for the remainder of the site. No specific sampling statistics or grid were utilised in this instance.

4.4 Laboratory Testing

As part of the further assessment for potential contamination of the site, selected samples were taken for the purpose of chemical contamination testing.

The potential contaminative process on site were associated with railway infrastructure, with hydrocarbon odours encountered and ash with made ground observed, therefore the following suite of determinands were chosen to screen for potential site impacts at a UKAS approved laboratory:

Determinand	No of Samples
BSL Default Soil Suite: Arsenic, Cadmium, Chromium (III), Chromium (VI), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), water soluble sulphate (2:1 Extract), soil organic matter (SOM) and pH.	8
Petroleum Hydrocarbons (TPH CWG) inc BTEX and MTBE.	4
Asbestos Screen.	8
Waste Acceptance Criteria (WAC).	3

The Chemical Laboratory Testing Results are presented in Appendix C.

Representative disturbed samples were obtained for all soil types encountered. Selected samples were scheduled for testing at an approved laboratory in accordance with BS 1377 'Method of Test for Soils for Civil Engineering Purposes' and BS EN ISO 17892- Parts 1-12:2018 'Geotechnical investigation and testing. Laboratory testing of soil'.

The following tests were scheduled for geotechnical purposes:

Description	No of Samples
pH Value.	6
Water Soluble Sulphate Contents.	6
SD1 BRE Full Suite.	3

The Geotechnical Laboratory Testing Results are presented in Appendix D.

4.5 Monitoring

Ground gas and ground water monitoring standpipes were installed in 6 boreholes and subsequently 3 monitoring visits were undertaken out of 3 proposed as part of the current scope. All gas monitoring was undertaken using either a GA5000 or GFM436 infrared gas meter with integral electronic flow analyser.

Previous gas monitoring has also been undertaken by Geotechnics as part of the previous investigation, including six gas monitoring visits over a period of six weeks. This data has also been included and assessed alongside the supplementary dataset within section 8.7, totalling 9 visits which exceeds the minimum recommendations set out in CIRIA C665.

Flow measurements on each standpipe (l/hr) were taken. Measurements of the percentage volume in air (%v/v) of oxygen (O₂), carbon dioxide (CO₂) and methane (CH₄) were recorded in addition to the percentage Lower Explosive Limit (%LEL) of methane (Note: 100% LEL equates to 5% by volume), the atmospheric pressure (mb) and average temperature during the visit (°C).

Standpipes were constructed in general accordance with the relevant guidance. A summary of the installation construction is presented in the table below:

Location	Internal Diameter Pipe	Response Zone (m bgl)	Targeted Strata	Purpose
WS101	35mm PVC	0.60 – 1.20	Made Ground	Ground Gas
WS102	35mm PVC	0.50 – 1.50	Made Ground	Ground Gas
WS103	35mm PVC	0.50 – 1.50	Made Ground	Ground Gas
WS104	35mm PVC	1.00 – 2.00	Made Ground	Ground Gas
RO103	50mm HDPE	18.00 – 20.00	Mudstone	Ground Gas
RP104	50mm HDPE	17.50 – 20.00	Mudstone	Ground Gas

The gas monitoring visits recorded peak and steady state conditions. Peak results are those that occur on opening the valve on the borehole tap. Steady state conditions are those that occur a period of time afterwards when the initial (accumulated) gases have been purged from the borehole.

Final ground gas monitoring results are presented in Appendix E of this report.

5.0 GROUND CONDITIONS

5.1 Summary

A brief summary of the ground conditions encountered is presented in the table below:

Stratum	Range Depths - Top (m bgl)	Range Depths - Base (m bgl)	Range Thickness' (m)	Brief Description
Made Ground	0.00	0.15 – 2.00	0.15 – 2.00	Gravelly SAND.
Natural Topsoil	0.00	0.20	0.20	Slightly gravelly slightly sandy CLAY.
Natural Superficial Strata	0.00 – 2.00	1.20 – 20.50	0.20 – 20.00	Sandy, gravelly CLAY.
Solid Geology	11.20 – 20.20	45.00	24.80 – 33.80	MUDSTONE, SILTSTONE, SANDSTONE.
Coal	17.80 – 40.50	18.00 – 40.80	0.20 – 0.30	COAL.

Details are provided in the logs in Appendix B and the individual strata are described in the sections below.

5.2 Made Ground

Made Ground – Topsoil

Made Ground Topsoil was encountered across the majority of the east section of the site within the now overgrown playing field. It generally consisted of grass over dark brown slightly sandy clay with rootlets. This was typically encountered between ground level and 0.20m bgl.

The Made Ground Topsoil within TP102 was recorded as a dark brownish black slightly clayey gravelly sand with anthropogenic inclusions of brick, coal, glass and metal, as well as gravels of mudstone and sandstone.

Made Ground – General

Made ground was encountered in the majority of the exploratory holes across the site and was observed from ground level to a maximum depth of 2.00m bgl, but the base was unproven in HP101, HP102 and WS106.

Hardstanding of tarmacadam was present across the south-east section of the site around the area of the school building and was typically 0.05m thick (WS104, WS106, RO106, TP108 & HP102). A sub-base was typically present below the tarmacadam comprising sandy gravel of limestone.

The made ground onsite generally consisted of dark brown to black gravelly sand with moderate ash content and anthropogenic inclusions of coal, slag, metal, brick, concrete, glass, plastic and timber, as well as sandstone and mudstone. This made ground is concentrated in the east half of the site and was encountered up to 2.00m bgl.

Cohesive made ground with the above inclusions was also encountered in WS101, WS102, WS103 and WS105, but is not observed to be as widespread as the granular made ground, being concentrated more in the north / central section of the site.

Rare organic matter was encountered within WS101 from 0.60m to 1.20m bgl with a mild organic odour.

5.3 Natural Superficial Strata

Within the north-east section of the site, the superficial strata is typically underlying granular made ground and generally consists of firm to stiff sandy gravelly clay. Generally, within the north-west section of the site (derelict playing field), the natural superficial strata consisted of a layer of soft to firm sandy gravelly

clay underlain by either gravelly sand or sandy gravel. This granular strata was then further underlain by a firm to stiff sandy gravelly clay.

Natural superficial strata was not encountered in the section of the site occupied by the school in the south during the BSL site investigation.

A soft grey gravelly sandy clay with rare organic matter was encountered in WS101 from 1.20m to 1.80m bgl.

SPTs indicate the sands range from medium dense to dense within the natural superficial strata.

Hand shear vanes and SPTs show the clays are predominantly firm to stiff except for localised soft clay encountered in WS101 (1.20-1.80m bgl) and WS105 (1.90-3.00m bgl).

5.4 Solid Geology

Bedrock comprising interbedded siltstone, mudstone and sandstone was encountered below the superficial deposits from depths between 11.20m to 20.20m bgl. Bedrock was proven to a maximum depth of 45.00m bgl across the site and is interpreted to be representative of Pennine Middle Coal Measures Formation.

The depth to bedrock varies across the site, specifically within the building footprint of the proposed school building, the depth to rockhead varies from 11.20m to 20.50m bgl. From assessing the ground model below the proposed development, the general trend shows that the bedrock is shallower in the south-west corner of the building footprint and proceeds to get deeper towards the north-east corner of the footprint.

Coal was also encountered within each of the rotary open boreholes undertaken during the site investigation and was encountered between 17.80m and 40.80m bgl with thicknesses ranging from 0.20m to 0.30m. Detailed depths of the coal encountered are presented in the table below:

Location	Range of depth (m bgl)
RO101	40.50 – 40.70
RO102	17.80 – 18.00
RO103	35.90 – 36.20
RO104	37.50 – 37.80
RO105	21.80 – 22.10 35.80 – 36.10
RO106	25.50 – 25.80 39.50 – 39.80
RO107	22.60 – 22.80 25.70 – 25.90 40.50 – 40.80
RO108	25.50 – 25.70 27.50 – 27.70

The depths to bedrock and depths to coal seams in the vicinity of the proposed building are shown on the Proposed Development Footprint Bedrock Profile drawing ref. C5394/05.

5.5 Groundwater

The depths to groundwater and locations present during site works are shown in the table below:

Location	Depth During Site Works (m)	Comments
HS101	NGW	-
HS102	1.10	Moderate seepage
TP101S	1.10	Small seepage
TP102	1.70	Large seepage
TP103	1.90	Large seepage
TP104	0.80	Small seepage
TP105	NGW	-
TP106	NGW	-
TP107	NGW	-
TP108	1.50	Large seepage
TP109	NGW	-
TP110	2.00	Small seepage
TP111	NGW	-
WS101	3.00	Small seepage
WS102	2.10	Small seepage
WS103	NGW	-
WS104	NGW	-
WS105	1.80	Small seepage
WS106	NGW	-

NGW – No Groundwater Encountered

Although all of the rotary core logs show that there was no groundwater encountered, this is unlikely to be representative due to the method of drilling.

Within installed standpipes, post site works monitoring has revealed the following depths to groundwater:

Location	Depth During Monitoring Period (range) (m)	
	Min	Max
Overall min/max	0.60	6.08
WS101	0.85	1.34
WS102	0.73	0.90
WS103	0.60	4.10
WS104	1.00	1.28
RO103	0.60	1.37
RO104	0.40	6.08

5.6 Observations

Contamination

During the works undertaken by BSL, observations for both visual and olfactory evidence of contamination were undertaken.

Ash was observed as a moderate constituent within made ground encountered in HP101, TP106, TP107, TP108 and WS104.

A slight hydrocarbon odour was recorded within the granular made ground within TP106, TP107 and TP108 in the eastern car park area.

WS103 was positioned adjacent to Geotechnics borehole BH03, where a hydrocarbon odour and oily sheen were noted beneath the made ground on the natural sands and gravels at 2.00m bgl, however no evidence of visual or olfactory contamination was noted by BSL.

Stability of Excavations/Boreholes

The sides of the trial pits were generally stable however collapse of the natural strata was observed in TP102, TP103 and TP109. In these locations the exploratory hole was terminated due to collapse. Generally, the cause of the pit collapse can be attributed to ingress of groundwater into the pit, causing the sides to become unstable.

TP108 was also terminated due a large groundwater strike.

The stiff nature of the clay within TP106 proved difficult to excavate at depth.

Casing was required to prevent collapse with the granular materials during drilling of the window sample boreholes.

Obstructions

An obstruction was encountered within WS106 as the SPT refused at 1.20m bgl within the made ground. The hole was terminated and was not moved to a different location due to restrictions from underground services in this area of the site.

6.0 TEST RESULTS

6.1 Geotechnical Laboratory Testing

The geotechnical testing results presented below are predominantly taken from the Geotechnics report, and it should also be noted that only the results relevant to the Geotechnical Assessment (those within or in close proximity to the proposed building footprint) have been included in the below summary.

Plasticity Index Analysis

Plasticity index results ranged between 13% and 24%. Associated water contents ranged between 10% and 26%.

After modification of particle size in accordance with BRE 240 the modified plasticity indices are in the range 9% to 21% indicating the cohesive soils to be of low to medium volume change potential.

Undrained Shear Strength

The results of the tests are shown in the table below:

Location	Depth (m)	Shear Strength (kPa)	Undrained Shear Strength to EC7
BH02	5.00	233	Very High
BH02	8.00	141	High
BH02	14.00	216	Very High
BH02	17.00	61	Moderate
BH03A	8.00	145	High
BH03A	11.00	180	Very High
BH04	3.00	233	Very High
BH04	8.00	92	High

Laboratory Hand Shear Vanes

The results of the tests are shown below:

Location	Depth (m)	Shear Strength (kPa)	Undrained Shear Strength to EC7
BH02	11	150	Very High
BH02	20	21	Low
BH04	5	150	Very High
BH04	11	150	Very High

Unconfined Compressive Strength (UCS) and Point Load Index

A summary of the information pertaining to the Unconfined Compressive Strength (UCS) of the intact rock material (not rock mass) related to mudstone bedrock at the site is shown in the table below. The point load index results have been used to derive the UCS using the relationship of $UCS=18 \times IS50$ for mudstone (ISRM).

Point Load Index (MPa) (range)		UCS Range (MPa)	Method	No. of results
Is	IS50			
0.00-0.32	0.01-0.38	0.90-5.94	Point load	27
-	-	2.4-36.3	UCS test	4

Point load and USC testing was also undertaken on other rock types encountered onsite by Geotechnics and is summarized in the below tables. A summary of the information related to the siltstone bedrock is

shown in the table below. The point load index results have been used to derive the UCS using the relationship of $UCS=20 \times IS50$ for siltstone (ISRM).

Point Load Index (MPa) (range)		UCS Range (MPa)	Method	No. of results
Is	IS50			
0.07-0.52	0.09-0.61	1.8-12.2	Point load	3
-		37.2	UCS test	1

A summary of the information related to the sandstone bedrock is shown in the table below. The point load index results have been used to derive the UCS using the relationship of $UCS=24 \times IS50$ for sandstone (ISRM).

Point Load Index (MPa) (range)		UCS Range (MPa)	Method	No. of results
Is	IS50			
0.93	1.03	20.6	Point load	1
-		35.6-42	UCS test	3

A summary of the information related to the coal bedrock is shown in the table below. The point load index results have been used to derive the UCS using the relationship of $UCS=18 \times IS50$ for coal (ISRM).

Point Load Index (MPa) (range)		UCS Range (MPa)	Method	No. of results
Is	IS50			
0.03-0.09	0.04-0.09	0.8-1.8	Point load	2

6.2 Aggressive Ground Conditions – Geotechnical Chemical Testing

The test results for the assessment of aggressive ground conditions are presented in Appendix D. The results are summarised and assessed within Section 8.0 of this report.

6.3 In Situ Geotechnical Testing

In Situ Hand Shear Vane Tests

Hand shear vane tests were carried out on suitable cohesive soils where possible. Each shear vane result recorded represents the mean value of three tests undertaken at the specified depth.

The results and distribution of the hand shear vane tests are recorded in kPa on the Exploratory Hole Logs which are presented in Appendix B.

In Situ Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out within the window sample boreholes at regular 1.0m intervals. The results of the individual blows and the N-values are recorded on the Exploratory Hole Logs in Appendix B.

All SPT N values are uncorrected. Density and strength descriptors are reported in accordance with the guidelines stated in BS 5930:2015+A1:2020, incorporating requirements of BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003.

6.4 Geo-Environmental Testing

Chemical Laboratory Testing

The chemical test results for soils are presented in Appendix C. The results are summarised and assessed within Section 8.0 of this report.

Ground Gas Monitoring

Ground gas monitoring installations have been monitored on 3 occasions to date out of 3 visits scheduled as part of the current scope. The results are presented in Appendix E and are summarised and assessed within Section 8.0 of this report.

7.0 GEOTECHNICAL ASSESSMENT

7.1 Ground Model Summary

The north section of the site consists of an overgrown playing field and a sports court surfaced in hardstanding in the north-easternmost section.

The lower south section of the site is comprised of a secondary school (Spring Lane School) and leisure centre (Radcliffe Leisure Centre) with associated hardstanding car parking areas.

The ground conditions can be summarised as below (top down):

-
- Made ground generally comprising sandy gravelly clay and gravelly sand from ground level to between 0.15m and 2.00m bgl.
 - Natural superficial deposits comprising sandy gravelly clay, clayey gravelly sand and sandy gravel proven to depths between 1.20m and 20.50m bgl.
 - Solid geology comprising mudstone, siltstone, sandstone and coal seams proven to depths of 45.00m bgl.
 - Groundwater levels ranging between 0.80m and 14.40m bgl during site works, with groundwater strikes commonly encountered within the top 3.0m bgl.
 - Post site works monitoring levels ranging between 0.60m and 8.50m bgl.
-

An intermediate pressure gas main is present running through the derelict playing field in the north-west section of the site and trends north-south. This will need to be taken into consideration for foundation design.

Large groundwater inflows were encountered within three trial pits (TP102, TP103 & TP108) which caused trial pit sides to become unstable and collapse. Post site work monitoring within borehole installations also showed generally shallow groundwater across the site, with the exception of RO104.

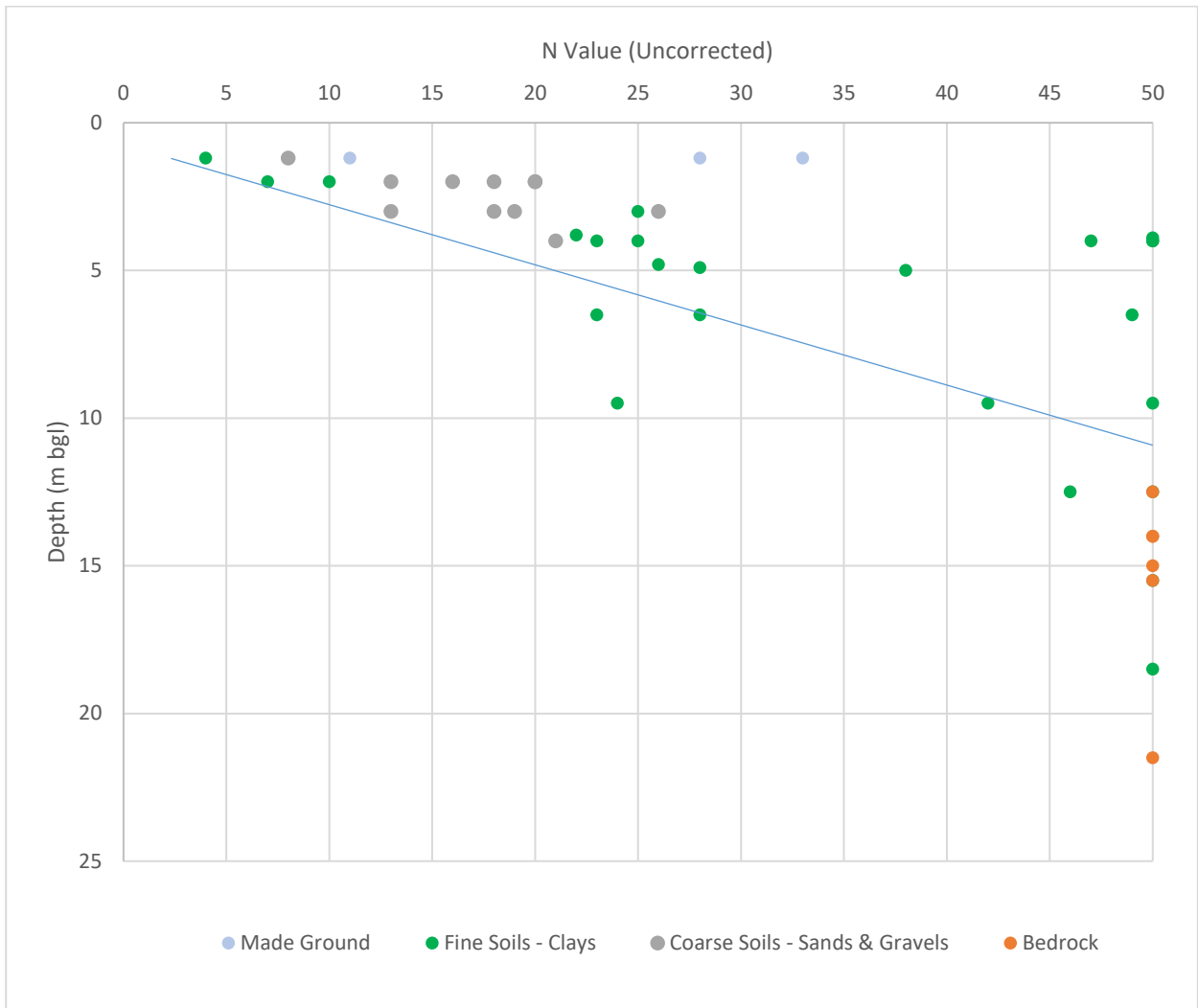
7.2 Design Soil Parameters

The relevant test results from the prior section have been evaluated to derive geotechnical soil parameters for the site. Within this section, only test results from within, or close to, the proposed building footprint have been used to aid the accuracy of foundation design. Due to the nature of the geotechnical assessment, which includes deep foundation solutions, data was taken from both the BSL and Geotechnics exploratory holes to provide a comprehensive profile of the ground which utilises both shallow and deeper data. Laboratory testing presented above in section 6.1 has also been used to inform preliminary foundation design.

Data from the following boreholes have been utilised from both the Geotechnics and BSL geotechnical investigation; BH02, BH03, BH03A, BH04 (Geotechnics). WS101, WS102, WS103, WS104, WS105, TP102, TP103 & TP108 (BSL). These are all within or in close vicinity of the proposed building footprint.

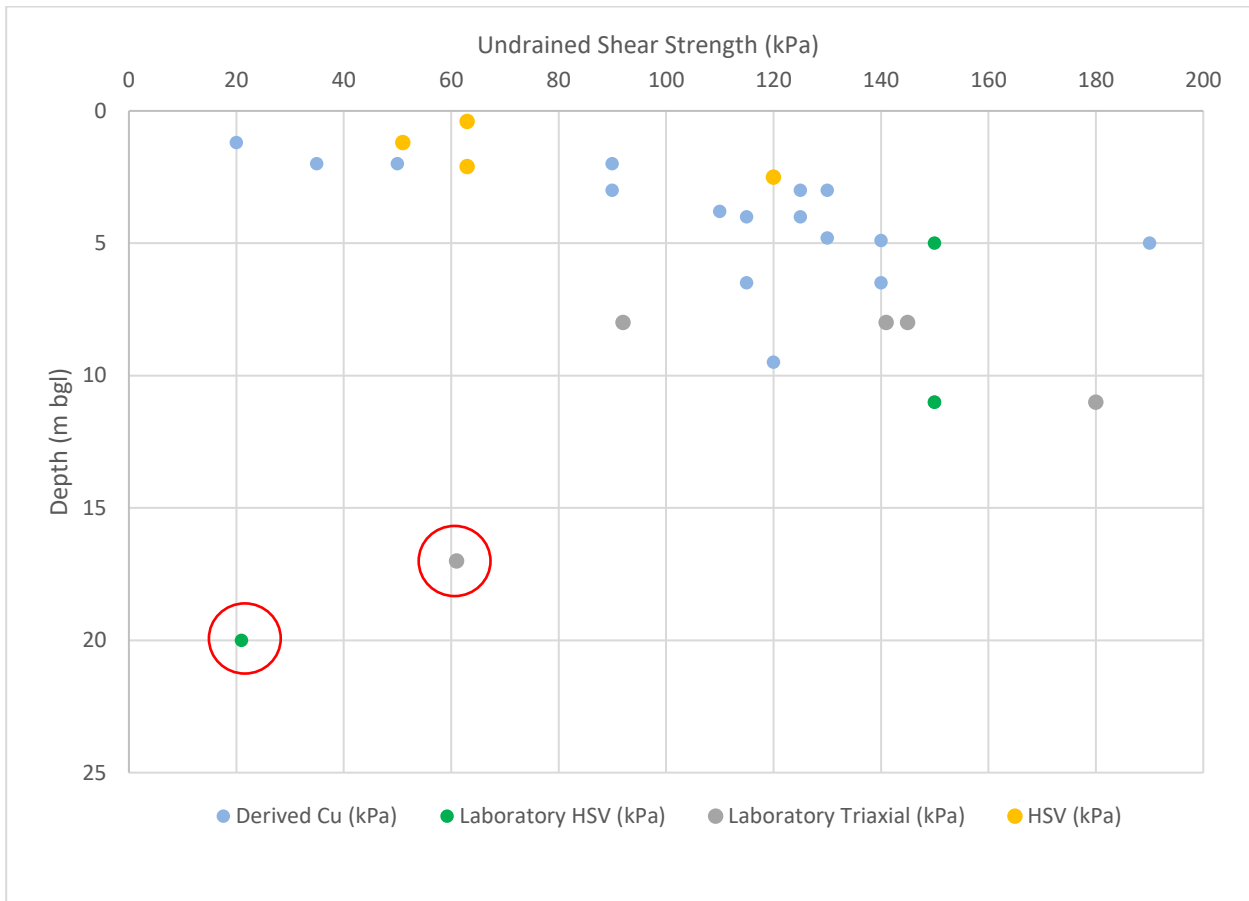
For cohesive (fine) soils, the equivalent approximate undrained shear strengths (C_u) have been calculated from the recorded SPT N values, adopting f_1 values based on the correlation of Stroud (1975) and the 'average' plasticity.

A depth (m bgl) vs SPT N value graph is also provided below to provide a profile of the granular materials underlying the area of the proposed building.



The above graph shows a general increase in strength with depth, although the cohesive deposits are seen to range with depth and therefore a line of best fit has been utilised to show the 'average' increase in depth in relation to the cohesive clay deposits.

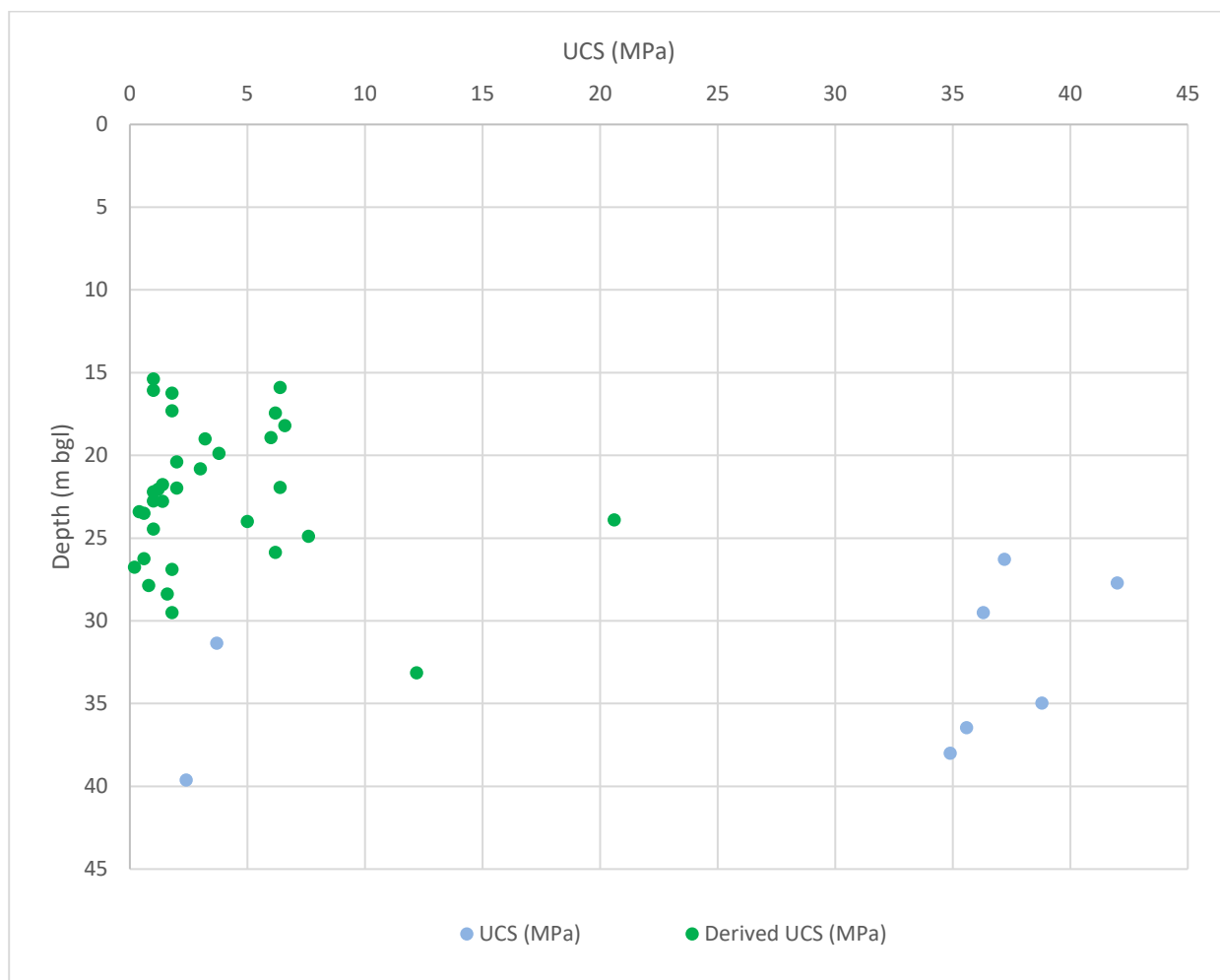
A depth (m bgl) vs derived shear strength (C_u) graph is also provided below to provide a profile of the cohesive soils underlying the site.



The above graph generally shows an increase of strength with depth within the proposed building footprint, with the exception of the two data points highlighted in red on the graph of samples taken from BH02. The soil description from BH02 at 17.00m and 20.00m bgl (result 61kPa and 21kPa, respectively) comprised very stiff sandy gravelly clay, which also has an SPT N value of 50 consistently from 15.50m bgl to rockhead which is encountered at 21.66m bgl, suggesting the clays are indeed very stiff. The gravelly nature of the clay may have resulted in an anomalous shearing of the material and this testing data is therefore considered unlikely to be representative of the soil profile as a whole, and the two results are discounted from the assessment going forward.

In addition, the shear strength derived from the SPT in WS101 at 1.20m is representative of a localised area of soft organic clay, which should be considered when determining characteristics values for the cohesive soils as a whole, given this is a localised area and not representative of the cohesive soils as a whole.

The Unconfined Compressive Strength (UCS) was determined by laboratory testing and was also derived from laboratory point load testing using the relationship of $UCS=18*IS50$ for mudstone (ISRM), $UCS=20*IS50$ for siltstone, $UCS=24*IS50$ for sandstone and $UCS=18*IS50$ for coal. A graph showing the variation in UCS and derived UCS vs depth is presented below to provide a profile of the variation in UCS of the bedrock with depth.



Based on the exploratory hole logs and geotechnical testing, the table below summarises the generalised ground conditions profile and characteristic geotechnical parameters beneath the proposed building footprint:

Stratum	Depth Top (m)	Depth Base (m)	SPT N Value	C_u (kN/m ²)	ϕ' (°)
Made Ground	0.0	1.7	6	30	N/A
Superficial Deposits – Granular	1.7	4.00	15	NA	31
Superficial Deposits – Cohesive	4.00	11.2 – 20.5	25	125	NA
Solid Geology – Mudstone and Siltstone	11.2 - 20.5	N/A	50	NA	41

7.3 Foundations

The development will comprise a three to four storey steel framed school building, including a sports hall and is considered to be classed as Geotechnical Category 2 in accordance with Eurocode 7.

Preliminary design by calculation has been undertaken to determine the design resistance of the bearing strata in the following section.

Approximate loads have been provided, with column loads at around 1300kN along the internal corridor lines and around 850kN at the perimeter columns.

This assessment is based on the existing ground levels and does not take into consideration any cut/fill exercise, which should be considered at the detailed design stage.

Ground improvement

Based on the proposed loads of the development this will preclude the use of traditional foundations unless improvement is undertaken on the existing soils.

As such, ground improvement by methods such as vibro compaction and/or the use of vibro stone columns (VSCs) should be considered for structures. This will create a stiffened platform and stiffened columns upon which to help spread the building loads and thus minimise differential settlement. The vibro stone columns would need to penetrate through the made ground and underlying any soft cohesive natural strata, down to a competent horizon. Given the earthworks and enabling works programme which will be required in order to create a suitable development platform, this increases the feasibility of a ground improvement solution across the building footprint and surrounding areas.

Highly organic and soils of shear strengths less than 30kPa are usually considered unsuitable for VSCs and an appropriate contractor should be contacted to confirm suitability of the materials on site. The soils encountered within the building footprint are generally considered suitable for this method. Locally soft and organic clays were encountered in WS101 between 0.60m and 1.80m, which are likely to be unsuitable and would require excavation during the enabling works and earthworks programme if vibro ground improvement is adopted. If ground conditions vary compared to those encountered during the site works, a suitably qualified engineer should be consulted.

On completion of the vibro treatment works, in-situ testing should be carried out to confirm the treatment meets the bearing capacity and deformation criteria for construction. Further guidance is provided in BRE 391 "Specifying vibro stone columns".

Following ground improvement, reinforced pads and ground bearing slab foundations could be used bearing onto the improved ground, usually at depths of circa 600mm depth. Typically, allowable bearing capacities of the order of 150kN/m² can be achieved, keeping total and differential settlements within tolerable limits, although this should be discussed with specialist contractors. Alternatively, a raft /semi-raft foundation could be used to distribute the structural loads across a stiffened layer, with installed columns acting as "rigid inclusions" to support the slab.

It is recommended that discussions are held with a competent ground improvement contractor to discuss options in detail including confirming suitability for the envisaged loads.

Alternatives - Piles

As an alternative to vibro improvement, and due to the likely magnitude of the column loads expected to be imposed by the proposed development, a piled solution may also be adopted.

Piles should be extended through the made ground and the superficial deposits. Depending on the structural loadings and design requirements, piles will likely utilise a combination of skin friction and end-bearing resistance, transferring the majority of the load to the underlying bedrock strata. Historical mining is not considered to be an issue below the structure at this site and should not impact pile design.

Displacement piles such as driven pre-cast concrete or tubular steel piles, or replacement techniques such as bored piles with the use of casing or continuous flight auger (CFA) piles are all considered potentially suitable piling solutions for this site, with either pre-cast or cast in situ ground beams spanning between piles to support masonry walls or cladding.

The choice of piling system and the detailed design of piles are beyond the scope of this report and should be undertaken by a piling specialist. However, as a guide, preliminary calculations were undertaken for a

single circular concrete pile, taking into account shaft resistance, end bearing resistance and the effects of negative skin friction. The preliminary allowable loads for various pile diameters and lengths are shown in the table below.

The profiles listed below have been split into different options dependent on the depth to rockhead, this is due to variability of the depth to bedrock across the proposed building footprint.

Profile	Assumed Depth to Bedrock (m bgl)	Pile Diameter (mm)	Pile Length (m)	Allowable Load (kN)
RO102, BH03A, RO105, RO106, BH04	12	300	14.00	430
		500	14.00 ^[1]	840
		750	14.00 ^[1]	1450
RO103, RO104, RO107	17	300	18.50	490
		500	18.50 ^[1]	940
		750	18.50 ^[1]	1600
RO101, RO108, BH02	20.5	300	22.00	560
		500	22.00 ^[1]	1050
		750	22.00 ^[1]	1800

[1] Not in compliance with EC7 as <5 pile diameters into bearing stratum.

The above does take into consideration the effects of pile groups or the self-weight of the pile. It is highly likely that pile groupings of 2 to 4 may be used to achieve the required column loadings.

Information gained from this ground investigation should be assessed by an experienced piling contractor such that appropriate piles are selected and designed given the site conditions that have been encountered.

Whilst detailed design is beyond the scope of this report, the following should be taken into consideration during the detailed design stage by a suitably competent contractor/engineer:

- Piles should extend a minimum of five pile diameters into the bearing stratum to fully mobilise end-bearing resistance and shaft resistance.
- Higher allowable loads than those listed in the table above could be achieved by increasing the diameter of the piles or by using pile groups.
- Obstructions in the ground (e.g. relict foundations) could cause piles to stop shallower than their anticipated design depth, or deviate from the vertical, therefore reducing their capacity.
- As groundwater was observed during the boring of the intrusive holes and monitoring, temporary casing may be required for bored piles.
- Bored piles through coarse soils will likely result in loosening, with resultant reduced shaft friction.
- CFA piles are likely to be a suitable alternative to driven piles to reduce noise levels, although there will be additional costs associated with disposal of excess soils.
- Driven piling work should be undertaken in accordance with BS EN 12699:2015 'Execution of Special Geotechnical Work - Displacement piles', replacement piles should be carried out in accordance with BS EN 1536:2010(+A1:2015) 'Execution of Special Geotechnical Works - Bored Piles'.
- In accordance with Eurocode 7 it would be prudent to verify the compressive resistance of the strata and the pile design should be by static load testing on working piles 1.5 times the characteristic load on more than 1% of working piles. This will provide an accurate strength of the end bearing stratum.

Working Platform

Prior to the commencement of penetrative works (piling/vibro), a working platform will be required for tracked plant. This should be designed and installed in accordance with BR470 (BRE 2004) based on the plant requirements, data and rig loadings.

Piling Risk Assessment

A risk assessment may be conditioned by the Local Authority for piling and/or the installation of VSCs, as there is a possibility that this could lead to creation of new pathways for migration of contamination.

7.4 Building Near Trees

The clay soils on site are of low to medium volume change potential. Medium volume change should be assumed for preliminary design purposes, although after earthworks confirmatory testing may confirm the materials below the structure are of low volume change potential. Where foundation excavations (or piles if adopted) encounter cohesive strata in the vicinity of existing, proposed or recently removed trees, foundations should be adjusted in full accordance with BRE 298. All foundations should be deepened below roots of greater than 5mm diameter during excavations for footings.

A survey of all trees and hedges on the site and within influencing distance of the site boundary should be undertaken to identify tree species and heights by a qualified arboriculturist in accordance with BS 5837:2012. This information will be required in order to assess the effects of trees on the cohesive strata.

Where foundation depths due to trees already present or recently removed exceeds 1.50m, there is a possibility for heave to occur on removal of the tree and guidance states that compressible material or void former is required against the inside face of the foundation / ground beam, unless it can be satisfied that the soil is not desiccated.

Where foundations are constructed on clay soils within the influencing distance of trees including proposed planting, the upper section of the pile (to the recommended minimum founding depth) should be sleeved or overbored to allow for clay volume change. Bored, cast-in-place piles are well suited to counteracting heave. Driven piles are less well suited to counteracting heave and are difficult to install in stiff desiccated clay without excessive noise and vibration.

7.5 Floor Slabs

A suspended floor slab should be adopted at the site supported by piles. Where cohesive (shrinkable) strata remain below the structure, the required void size for beneath floor slabs on this site is 250mm based on the low to medium volume change potential clays.

Alternatively, ground bearing floor slabs supported by vibro improved ground on a grid fashion i.e. "rigid inclusions" could be adopted, provided the below criteria are also considered:

-
- Any other compressible or unsuitable materials (topsoil containing vegetation and organic matter, including tree roots, are excavated and either improved or removed and replaced with suitable materials
 - Any fill beneath the slab is suitable, well-compacted granular material placed in an appropriate thickness in accordance with a suitable specification (e.g. SHW Series 600) designed and supervised by an appropriately qualified engineer, with the end performance validated.
 - The slab is adequately reinforced.
 - Regular construction joints and ties are provided to allow for differential settlement.
-

The final floor slab design should be of sufficient thickness and sufficiently reinforced to accept the envisaged applied loads, without unacceptable total or differential movement.

Vertical elements within the structure, such as columns and walls will need to be isolated from the ground bearing slab in order to allow for the slab to expand against them without resulting in cracking.

Prior to the placement of the founding materials and the construction of a ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a geotechnical engineer to ensure the ground conditions are as expected. If soft spots or hard spots are identified at the formation level, they should be reported to the Geotechnical Engineer immediately and remedial actions agreed.

Incorporation of geogrid reinforcement at formation level, before granular material is placed and compacted, will likely minimise required excavation depths and help provide a suitable foundation for the ground bearing slab.

Ground floor slabs should also be designed to incorporate any ground gas protections measures, where required, although these are not anticipated to be required based on the data available.

7.6 Site Preparation and Construction

Topsoil and subsoil should be removed from beneath all proposed buildings and hardstanding areas.

If organic soils are encountered below the proposed buildings then these will need to be removed – notably the localised soft organic clays encountered in WS101 between 0.60m and 1.80m bgl.

There are a number of services crossing the site including an intermediate pressure gas main. To allow remediation and construction, all services will need to be disconnected and any suspected dead services are confirmed as dead by testing.

Instability of the made ground and granular superficial strata should be allowed for. All excavations should be carried out in accordance with CIRIA Report 97 'Trenching Practice'.

Collapsing of the trial pit sides was observed in the natural granular strata and temporary shoring maybe required. Otherwise, the foundation excavations will be significantly wider than anticipated and costs will be incurred for additional volumes of concrete.

Excavation depths should generally be readily achieved using conventional plant (JCB or similar) although high specification plant (tracked 360° or similar) is recommended to maintain the build programme.

It should be noted that undertaking ground improvement locally or using deepened foundations (i.e. focussing only on the footprint of structures) means that the surrounding areas (roads, gardens and landscaping) are likely to settle relative to the structures if disturbed. This risk can be mitigated by undertaking more widespread ground improvement through techniques such as dynamic compaction, surcharging or excavation and re-compaction, which could be incorporated into the wider earthworks programme.

To protect against the effects of heave, new drainage in cohesive soils should be designed to take account of potential ground movement, including where pipes and services which pass through substructure walls or foundations. The volume change potential on this site is low to medium and the potential ground movements that need to be considered for design are 100mm.

Recorded post site works groundwater levels ranged between 0.60m and 8.50m bgl and therefore will be encountered within likely excavation depths. Based on the exploratory hole logs and monitoring, which have identified a high groundwater table and rapid ingress of groundwater into some trial pits, it is possible that conventional methods such as sump pumping may not be sufficient to deal with anticipated flows and alternative methods of dewatering may be required such as dewatering wells. A specialist dewatering contractor should be consulted for advice in this instance. Further guidance is provided in CIRIA C750 "Groundwater Control: Design and Practice". It should be noted that groundwater levels will vary seasonally and the timing of construction may influence requirements.

Any water pumped from excavations may need to be passed via settlement tanks and treated before being discharged to the sewer; discharge consents/permits will also be required.

7.7 Mine Workings

The site is located within an area where coal seams are abundant and is noted to be within a Coal Authority Development High Risk Area as shown on the Coal Authority Interactive Map. The site also appears to be located within a fault block. The BGS mapping (1:50,000 Sheet 85 Manchester, Solid Edition) shows faults to be present to the north-east and south-west of the site, these faults are both indicated to be strike slip faults trending north-west to south-east and are shown to displace the coal seams outcropping onsite.

The Coal Mining Risk Assessment (PH/C5394/12312) undertaken by Brownfield Solutions Ltd has identified that a total of eleven coal seams are recorded to be present below the site, their depths ranging from outcropping directly below the superficial deposits to 246m below the site. The regional direction of dip of the bedrock is towards the south-east, ranging from 9° and 24°, with the closest dip being 9° which is shown onsite on the geological mapping. The records from the geological memoir and Consultants Coal Mining Report indicate the seams range in thickness from 0.80m to 4.60m. The shallowest seams are indicated to be the Stonedelf and Ashclough Mines which are both indicated to subcrop onsite beneath the superficial deposits, striking north-east to south-west and 1.70m and 2.46m in thickness respectively. The next shallowest coal seam is indicated to be the Top Five Quarters (Bin) Mine at a depth of 24m below rockhead. Full details of the seams recorded beneath the site, as assessed in the Coal Mining Risk Assessment, are presented below:

Seam	Approximate Distance from Site (m)	Thickness from Geological Memoir (m)	Thickness calculated from Within's Pit BGS Log (m)	Anticipated Depth from outcrop calculations (m)
St D M – Stonedelf Mine	Onsite NW	1.70	-	Subcropping – 28.5
As M – Ashclough Mine	Onsite NW	2.46	-	Subcropping – 39.6
T 5 QRS – Top Five Quarters (Bin)	152m NW	1.00	-	24-72
LYD – Lower Yard	863m NW	0.76	-	136-185
W M – White	95m N(Faulted)	1.00	1.50	164-207
BK M – Black	227m N (Faulted)	0.90	1.20	182-225
G M – Gingham	317m NW (Faulted)	1.20	0.80	203-246
5QRS – Five Quarters	444m NW (Faulted)	1.50	1.20	190-224

The following seams are interpreted to dip beneath the site as detailed in the Consultants Coal Mining Report.

Seam	Approximate Distance from Site (m)	Thickness from Geological Memoir (m)	Extraction Thickness from CA Consultants Report (m)	Thickness calculated from Within's Pit BGS Log (m)	Anticipated Depth from outcrop calculations (m)	Depth Provided by Coal Authority Report (m)
T3YDS – Top Three Yards (Top Yard, Shuttle and Crumbouke Mines, Brassey & Roger (in east of coal field)) –	584m NW	4.60*	1.90	-	92.5-141	65

Seam	Approximate Distance from Site (m)	Thickness from Geological Memoir (m)	Extraction Thickness from CA Consultants Report (m)	Thickness calculated from Within's Pit BGS Log (m)	Anticipated Depth from outcrop calculations (m)	Depth Provided by Coal Authority Report (m)
Possibly also Nine Feet Mine						
2YDS – Two Yards (Rams & Six Feet)	711m NW	1.80	1.70	-	112-161	96
Doe – Doe (Dow)	419m NW (Faulted)	3.40	1.00	3.50	188-221	141-149

*This seam is encountered as two bands with up to 1.80m of fireclay between, this figure is based off the total thickness of both seams and fireclay.

NB: The range of depths stated above refers to the west boundary depth and east boundary depth respectively.

The Coal Mining Risk Assessment identified the following risks which were considered to be significant enough to require further investigation or remedial action:

- High risk from unrecorded coal workings.
- Moderate risk from unrecorded mine entries.
- Moderate risk from mine gas.

The recorded mine workings highlighted in the Consultants Coal Mining Report were not considered to be a risk to the development due to the recorded depths in both the Mining Report and the Abandonment Plans acquired for the site. But as both the seams recorded to be subcropping onsite are shown to be of workable thickness, there was considered to be a high risk from unrecorded workings. The moderate risk to unrecorded mine entries also relate to the two seams subcropping onsite and due to the relatively shallow thickness of superficial deposits.

Following the Coal Mining Risk Assessment, Geotechnics completed an initial ground investigation comprising drilling of 4 No. rotary boreholes in the vicinity of the proposed building, and did not identify any evidence of shallow coal workings or unrecorded mine entries up to 45m below the site, no loss of flush or voids were encountered during the drilling. In addition, the initial ground investigation demonstrated the depth to bedrock beneath the site ranged between approximately 13m and 20.5m bgl. It should be noted that at these depths the feasibility of primitive mining methods, such as bell pits, are less feasible due to the risk of mine entry collapse. In addition, the high groundwater table further reduces the likelihood of unrecorded mine workings and entries due to the challenging conditions created by the thickness of superficial deposits and difficulties with dewatering using primitive methods.

Following the initial investigation by Geotechnics, to increase confidence in the existing assessment, BSL carried out a detailed mining investigation comprising the drilling of 8 No. rotary open holes within the footprint of the proposed building to further investigate the potential for shallow unrecorded mine workings.

The below table shows the depths and thicknesses of the coal encountered onsite during the investigation undertaken by BSL:

Location	Range of depth (m bgl)	Thickness
RO101	40.50 – 40.70	0.20
RO102	17.80 – 18.00	0.20
RO103	35.90 – 36.20	0.30
RO104	37.50 – 37.80	0.30

Location	Range of depth (m bgl)	Thickness
RO105	21.80 – 22.10 35.80 – 36.10	0.30
RO106	25.50 – 25.80 39.50 – 39.80	0.30
RO107	22.60 – 22.80 25.70 – 25.90 40.50 – 40.80	0.20-0.30
RO108	25.50 – 25.70 27.50 – 27.70	0.20

The coal seams encountered during the BSL Investigation ranged in thickness between 0.20m and 0.30m in thickness, whereas the thickness of coal encountered within the Geotechnics investigations ranged from 0.15m to 1.58m. It should be noted that the Geotechnics investigation comprised rotary coring which is likely to provide a greater accuracy in seam depths due to the nature of sample recovery in openhole drilling. Nevertheless, in both investigations, no evidence of workings was encountered such as loss of flush, broken ground, voids or soft drilling.

One coal seam within BH02 and one coal seam encountered within BH03A do not meet the 10T criterion. Guidance within CIRIA C758 'Abandoned Mine Workings Manual' indicates that a void will not migrate to the surface where there is more than ten times the seam thickness of rock cover (10t criterion, Piggott and Eynon 1978; Wardell and Eynon 1968). Up to this depth, the void will begin to choke with rock from the roof, which is represented by broken ground. As detailed below:

Location	Coal Seam Depth (m)	Rock Cover
BH02	26.80 - 28.00 (1.20)	6.30
BH03A	19.50 – 20.40 (0.90)	6.40

Although these do not meet the 10T criterion, as there was no evidence of coal workings below the building footprint during the BSL investigation and the majority of the coal seams encountered in this section of the site are not of workable thickness, the likelihood of any workings being present is considered to be low. In addition, due to the high density of coverage gained by the eleven rotary boreholes undertaken by BSL and Geotechnics which are located within and in close vicinity of the proposed building footprint, this significantly increases confidence in the assessment that the risk of unrecorded workings in this area of the site is very low. Despite the lack of coverage in other parts of the site, as stated above the consistently high groundwater table and significant thickness of superficial deposits provides further confidence that the risk of mining across the site as a whole is likely to be low.

In conclusion the overall risk from shallow unrecorded mine workings is considered to be low and no further action is required below the proposed structure.

7.8 Treatment of Mine workings

As no evidence of mine workings were encountered onsite during both the investigations by BSL and Geotechnics, engineering treatment of mine workings such as drilling and grouting is not considered to be required for proposed structures.

However, given the lack of coverage in other parts of the site outside of the building footprint which are still located in the Coal Authority Development High Risk Area, consideration should be given to the installation of to a geogrid across roads and car parking areas, as a form of mass subsidence prevention. The POS and sports pitches would not need these measures beneath them, as they are considered to be lower risks areas as per the guidance within CIRIA C758.

The findings and recommendations made within this assessment should be confirmed with the Local Authority, and Coal Authority, prior to any irrevocable action at the site.

7.9 Concrete Classification

The soluble sulphate and pH test results have been assessed in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005. The Design Sulphate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in the table below.

For the purposes of this assessment, the made ground and natural strata is considered to be relatively permeable, therefore the groundwater has been classed as mobile.

Stratum	No. Samples	Characteristic SO ₄ (mg/l)	Characteristic pH	DS Class	ACEC Class
Made Ground	8	339	6.1	DS1	AC-2z
Natural Superficial Strata	9	82	6.8	DS1	AC-1

Based on the above, the results of laboratory pH and sulphate content, alongside the BRE full suite tests, indicate that sulphate class DS-1 and ACEC Class AC-1 conditions prevail in the natural superficial strata whereas the made ground comes under ACEC class AC-2s, in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005.

The specific concrete mixes (the Design Concrete Class) to be used on site will be determined by the site-specific concrete requirements in terms of the durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM) detailed in Part D of BRE Special Digest 1 with further guidance in Pt E and F.

7.10 Highways

Based on Table 5.1 from DMRB IAN 73/06 Rev 1 equilibrium CBR values of 2% are likely to be achieved in made ground soils, 2% for natural clays soils and 5% for natural granular soils for pavement design purposes, unless proven otherwise by in-situ testing at formation level by a specialist geotechnical engineer.

The previous Geotechnics report, which did include in-situ and laboratory CBR testing, reports a CBR value of 10% where the subgrade is comprised of granular materials and where the subgrade material is cohesive, a CBR value of 3% should be adopted. But it also states it would be prudent to undertake further testing to confirm this.

Where the CBR is found to be less than 2%, the sub-grade is unlikely to be suitable for both the trafficking of site plant and as a permanent highway foundation without improvement of the soils.

Based on the fines content of the soils, they are considered to be frost susceptible, therefore highway construction should be a minimum thickness of 450mm to mitigate against the risk.

Care should be taken to ensure the stratum at formation level is protected against inclement weather, as this is likely to lead to surface deterioration and a decrease in soils strengths.

7.11 Site Drainage

The use of sustainable drainage systems, such as traditional soakaways within the natural ground, is not likely to be feasible due to the presence of low permeability cohesive strata underlying the site and the presence of high groundwater levels across the site.

7.12 Earthworks

Given the variability of existing site levels and development layout requirements including finished levels, earthworks will be required in order to achieve the desired development platform levels.

Design of the earthworks, particularly in the western part of the site, should consider the stability of any cut or fill slopes. Any fill should be placed in accordance with an appropriate specification, discussed further below. Designs should allow for incorporation of suitable drainage to prevent the build-up of pore water pressure which could lead to slope instability.

Where it is proposed to re-use site won or imported materials as an engineered fill, it will be necessary to develop an appropriate Earthworks Specification. The basis for the Specification should be BS 6031:2009 and the latest version of the SHW, Series 600 Earthworks. Note, testing for earthworks was outside the scope of this report, but will be completed and inform a separate Earthworks Specification to be issued under a separate cover.

If site-won material is to be re-used on site, it is recommended this is carried out under the CL:AIRE Development Industry Code of Practice (DoWCoP CL:AIRE March 2011).

8.0 GEO-ENVIRONMENTAL RISK ASSESSMENT

8.1 Introduction

The samples were tested for an assessment of the chemical contamination that may pose a risk to human health. The results were examined with reference to a selection of guidance documents as detailed in Appendix A. In this case the LQM/CIEH S4ULs and DEFRA C4SLs for a residential end use without homegrown produce have been adopted as Tier 1 generic screening values due to the development being a school building, adopting a relatively conservative approach.

The apparent exceedance of the relevant screening value is taken as indicating further detailed assessment or remedial action is required.

A summary assessment sheet is presented in Appendix C alongside the chemical test results. Results are discussed in detail in the sections below.

8.2 Soils Test Results and Risk Assessment – Human Health

The following elevated metals were detected during the investigation undertaken by BSL:

Exploratory Hole	Depth (m)	Stratum	Metal	Concentration (mg/kg)	Adopted Screening Value (mg/kg)
TP108	0.10 – 1.00	Made Ground	Arsenic	43	40
HP101	0.30 – 1.10	Made Ground	Arsenic	43	40

The following elevated metals were detected as part of the previous Geotechnics investigation:

Exploratory Hole	Depth (m)	Stratum	Metal	Concentration (mg/kg)	Adopted Screening Value (mg/kg)
DS01	0.50	Made Ground	Arsenic	130	40
			Lead	380	310

Asbestos

No asbestos fibres have been detected in any of the 8 samples screened by BSL. Additionally, no asbestos fibres were detected as part of the 16 samples screened by Geotechnics.

Poly Aromatic Hydrocarbons (PAHs)

The locations, depth and concentrations of elevated species of PAHs are summarised in the table below:

Exploratory Hole	Depth (m)	Stratum	Species	Concentration (mg/kg)	Adopted Screening Value (mg/kg)
TP106	0.40 – 1.25	Made Ground	Benzo(b)fluoranthene	6.90	4.00
			Benzo(a)pyrene	5.70	5.30
			Dibenz(a,h)anthracene	0.65	0.32
HP101	0.30 – 1.10	Made Ground	Dibenz(a,h)anthracene	0.33	0.32

The following PAH elevations were detected as part of the previous investigation by Geotechnics:

Exploratory Hole	Depth (m)	Stratum	Species	Concentration (mg/kg)	Adopted Screening Value (mg/kg)
DS05	0.5	Made Ground	Naphthalene	21.00	5.60
			Benzo(a)anthracene	23.00	14.00
			Benzo(b)fluoranthene	23.00	4.00
			Benzo(a)pyrene	19.00	5.30
			Dibenz(a,h)anthracene	2.10	0.32
HDP04	0.2	Made Ground	Dibenz(a,h)anthracene	0.34	0.32

Total Petroleum Hydrocarbons (TPH CWG)

No petroleum hydrocarbons have been identified above the adopted screening criteria.

BTEX and MTBE

No BTEX or MTBE compounds have been identified above the adopted screening criteria.

Volatile Organic Compounds (VOCs)

No VOCs have been identified above the adopted screening criteria.

Semi - Volatile Organic Compounds (SVOCs)

No SVOCs have been identified above the adopted screening criteria.

8.3 Summary – Human Health Risk Assessment

Based on the testing and assessment undertaken it would appear that there is pervasive contamination within the made ground in the form of metals and PAHs attributed to ash within the made ground strata and is especially prevalent in the eastern half of the site, likely related to the historic railway development in this section of the site.

The above pose a risk to human health and will require further consideration.

8.4 Waters and Leachate Test Results – Controlled Waters

Groundwater and leachate testing was not undertaken as part of the current scope, but groundwater and leachate testing was included in the previous site investigation, which identified a number of exceedances of the Environmental Quality Standards (EQS) and Drinking Water Standards (DWS) for various metals as well as minor exceedances in short chain aliphatic hydrocarbons and PAHs.

However, Geotechnics considered the elevated contaminants in groundwater and leachate analysis were representative of natural background concentrations in groundwater due to the lack of correlation between elevated soil contamination including leachates, and contaminants present in groundwater. Furthermore, it was anticipated that the levels of manganese are likely increased due to the oxidation of the naturally occurring iron within the groundwater when being sampled.

8.5 Controlled Waters Risk Assessment

Whilst there are elevated concentrations of contaminants, based on the investigation works undertaken to date and subject to agreement with the Environment Agency, the site is not considered to pose a significant risk to controlled water for the following reasons:

- No significant anthropogenic sources of these contaminants were identified during the ground investigation and are likely to be representative of naturally occurring background concentrations.

- There does not appear to be any clear linkage between contaminant concentrations within soils and leachates when compared to exceedances within groundwater.
- No visual or olfactory evidence of gross contamination has been encountered during the site investigations to date.
- There is no indication under present conditions of pollution of controlled waters and conditions following development of the site will not be any worse, indeed they may improve with increased hard cover and water retaining imported soils.
- It would be technically challenging and probably disproportionately costly to remove the contaminants from the water to the pre-input stage.
- The above is especially pertinent given the relatively minor exceedances of PAHs and petroleum hydrocarbons.
- A canal is present to the north of the site but a pathway is unlikely to exist due to the canal likely being clay lined. The nearest natural watercourse is circa 130m away based on the desk study, which provides considerable distance for attenuation and contaminant degradation.
- The site is underlain by low permeability clays, representing a Secondary Undifferentiated Aquifer, which itself is not a sensitive receptor and will inhibit lateral and vertical contaminant migration.
- Whilst the deeper aquifer is classified as a Secondary A Aquifer, due to the presence of coal mining at depth in the surrounding area, groundwater quality within the aquifer is likely already relatively poor when compared to the results of shallow groundwater taken from the boreholes on site.
- The site does not lie within 500m of an SPZ.
- There are no potable (sensitive) water abstractions within 500m.

8.6 Permanent Ground Gas and Vapours Results

A total of 3 ground gas monitoring visits have been carried out between the dates of 30th August and 27th September 2023. Results are summarised in the table below:

	CH ₄ (%)		CO ₂ (%)		O ₂ (%)		CO (ppm)		H ₂ S (ppm)		TVOC (ppm)		Steady Flow (l/hr)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Peak	0.0	41.6	0.0	11.7	0.1	21.5	0.0	22.0	0.0	1.0	0.0	1.0	-0.6	21.7
Steady	0.0	26.1	0.0	9.6	4.7	20.8							0.0	37.8

Notes: CH₄ = Methane; CO₂ = Carbon dioxide; O₂ = Oxygen; CO = Carbon Monoxide; H₂S = Hydrogen Sulphide; TVOC (PID) = Total Volatile Organic Compounds (as measured with Photo Ionisation Detector); ppm = Parts Per Million.

The highest methane concentrations were recorded within WS101 (41.6% v/v) on the second monitoring visit, whilst the highest carbon dioxide concentrations were recorded in WS104 (11.7% v/v) on the second visit. The maximum flow of 37.8 l/hr was recorded in RO103 on the third visit. Methane was only detected within WS101 throughout the monitoring period, with no methane concentrations being recorded in any of the other 5 installations throughout all 3 visits.

The atmospheric pressure ranged between 1001mb and 1010mb over the monitoring period, of which visits were conducted over a range of falling and rising pressure trends.

Groundwater levels were recorded above the response zones in RO103 and RO104 on 3 out of 3 visits.

During the monitoring period, due to the high groundwater levels in the boreholes, after the peak reading were taken, the groundwater was purged from the boreholes and left for a short period of time before taking the steady gas flows. This was due to the potential for a piston effect to impact the results of the steady flow, by purging the groundwater from the holes before monitoring, this gives a more representative reading of the steady flow rates in the boreholes.

The steady flow rate recorded in RO103 on the third visit was 37.8 l/hr, however this occurred during recharge of the groundwater level which is likely to have resulting in pushing air within the borehole column upwards creating an artificially high flow reading. This also occurred within the same borehole RO103 on the first visit, when a steady state flow reading of 5.7 l/hr was recorded following purging.

Summary of Geotechnics Monitoring Dataset

A total of 6 ground gas monitoring visits have been carried out between the dates of 16th June and 20th July 2022. Results are summarised in the table below:

	CH ₄ (%)		CO ₂ (%)		O ₂ (%)		CO (ppm)		H ₂ S (ppm)		TVOC (ppm)		Steady Flow (l/hr)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Peak	0.0	0.1	0.0	4.0	6.1	20.3	0.0	3.0	0.0	0.0	0.0	0.0	-0.3	17.5
Steady	0.0	0.0	0.0	4.0	6.1	20.3							-9.7	3.6

Notes: CH₄ = Methane; CO₂= Carbon dioxide; O₂= Oxygen; CO= Carbon Monoxide; H₂S= Hydrogen Sulphide; TVOC (PID)= Total Volatile Organic Compounds (as measured with Photo Ionisation Detector); ppm= Parts Per Million.

The atmospheric pressure ranged between 990mb and 1025mb over the monitoring period, of which visits were conducted over a range of falling, rising and steady pressure trends.

The concentrations of carbon dioxide and methane were consistently very low to negligible, with a maximum carbon dioxide concentration of 4% v/v recorded in BH03A on the final visit, and the maximum methane concentration of 0.1% v/v recorded in BH03A on the first visit. Ground gas flow rates were consistently low, generally ranging from 0.0 l/hr to 0.7 l/hr. A steady state flow rate of 3.6 l/hr was recorded in BH02 on the final visit, however this is likely attributed to a significant rise in groundwater level from 1.95m bgl to 8.50m bgl between the fifth and sixth visits, causing artificially high and unrepresentative flow rates. Groundwater levels were consistently recorded above the response zone in BH02, further suggesting that the flow rates from this borehole should not be relied upon heavily for assessment.

Over the course of the monitoring period completed by both Brownfield Solutions and Geotechnics, a total of 9 visits have been completed comprising a total of 48 individual steady-state monitoring datapoints. With the exception of the two likely erroneous flow readings taken from RO103 due to the piston effect, flow rates have been consistently low, ranging from 0.0 l/hr to 0.7 l/hr. Therefore, it is recommended that a 'typical' maximum flow rate of 0.7 l/hr is adopted for the purposes of this assessment.

8.7 Ground Gas Risk Assessment

Basis of Assessment

In order to assess the ground gas situation and the requirement for ground gas precautionary measures at the site, guidance was taken from CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015+A1:2019 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

Rationale and Suitability of Dataset

As per the Phase 1 Desk Study, in accordance with CIRIA C665 and as set out in Appendix A of this report, the ground gas generation potential is considered to be **low** (sources including possible shallow mine workings, made ground and mildly organic clay). The sensitivity of the development is **moderate** on account of the proposed school development.

In line with current guidance, it is recommended gas monitoring should comprise 6 visits over a 3-month period. The required monitoring frequency has been exceeded, given a total of 9 visits have been

completed over two separate periods of monitoring; 6 visits over 6 weeks by Geotechnics in June and July 2022, and 3 visits over 4 weeks by BSL in August and September 2023. A total of four visits were carried out during periods of low and/or falling atmospheric pressure, including a relatively rapid fall in atmospheric pressure from 1014 mbar to 1000 mbar preceding the monitoring visit carried out by Geotechnics on 24/06/2022, therefore reasonable 'worst case' conditions are considered to have been captured during the monitoring.

Due to groundwater being above the response zones in two of the boreholes (RO103 & RO104), a GSV should not be calculated from the flows obtained as they are not representative of natural flows. In addition, these boreholes were installed within bedrock and designed to target the potential ground gas source associated with possible shallow mine workings. Therefore, the potential ground gas risk associated with coal mining will be assessed separately in accordance with current guidance and best practice.

Assessment of Data – Shallow Boreholes

As the proposed end-use is for a commercial/school development, guidance dictates that the gas monitoring results should be assessed in accordance with the Wilson and Card methodology.

The Wilson and Card methodology uses the concept of a Gas Screening Value (GSV) which is derived using the following equation: $(\text{max gas concentration} / 100) \times \text{maximum steady flow}$.

The GSV's presented below are from the BSL window sample boreholes and Geotechnics dataset which targeted the made ground and superficial deposits. A typical steady flow of 0.4l/hr has been used to derive the GSVs. The GSV's for the site are presented below.

Ground Gas	Adopted Typical Flow Rate (l/hr)	Max Concentration (% v/v)	GSV (l/h)	Classification based on GSV	Typical Threshold Concentration Exceeded
Methane	0.4	41.6	0.166	CS2	Yes
Carbon Dioxide	0.4	11.7	0.0456	CS1	Yes

The GSVs place the site into Characteristic Situation 1 (CS1) for carbon dioxide, however due to concentrations of carbon dioxide greater than 5% v/v being recorded at the site then guidance states **consideration** should be given to increasing the site classification.

From the GSVs above, the site has preliminary been classified as CS2 in regard to the methane concentrations but is unlikely to pose a risk to the site. Methane was only detected within one borehole during the monitoring period (WS101), the maximum flow within this hole during the monitoring was recorded as 0.1l/hr, showing that no significant flows were detected within this hole. Furthermore, the response zone in this hole was targeting a localised stratum comprising cohesive made ground with a mild organic odour and rare organic matter content. From installing the borehole within this strata, the disturbance of the ground and the act of introducing oxygen to the strata has likely contributed to oxygenation of the organic matter within the made ground, resulting in the high methane concentrations. This environment is not likely to be able to be recreated naturally and therefore the methane concentration is likely to be an artificial result of the borehole installation. In addition, this material was not encountered in other exploratory hole locations and is therefore highly localised and not representative of the ground conditions as a whole. In addition, geotechnically unsuitable soils such as soft organic clays will likely be removed from the building footprint and surrounding areas as part of any enabling works and earthworks programme, thus removing the source of methane.

To further support that this is an isolated occurrence of methane, the gas monitoring results from the previous Geotechnics investigation did not show any elevations of methane, carbon dioxide or high flows. **Due to the above, it is recommended that in respect to methane the site be classified as CS1.**

Based on the GSVs for carbon dioxide alone, the site falls into the CS1 classification. However, on numerous occasions and in a number of locations, carbon dioxide exceeded the 5% threshold concentration where consideration should be given to upgrading the classification. Whilst the high flows have largely been discounted, the potential effects of construction affecting the gas regime and creating pathways cannot also be fully ignored. Therefore, in order to build confidence that the site is CS1 we have undertaken the below assessment.

Ternary Plot Assessment

The most likely source of carbon dioxide encountered to date is likely to be microbial respiration of small quantities of organic matter in the general made ground.

In order to further increase confidence in this assessment and adopting a lines of evidence approach, reference has been made to the 2018 paper by Wilson et al (Ambience and EPG Ltd) "Using ternary plots for interpretation of ground gas monitoring results" and the latest NHBC NF94 guidance.

The paper states that carbon dioxide is widespread in the sub surface environment and is generated by microbial and geochemical processes. If there is any organic, carbonate or pyrite content in the soils or rocks then carbon dioxide could potentially be present at concentrations up to 21% v/v. Soils in the UK where carbon dioxide is present commonly include glacial Till and made ground.

When monitoring wells are installed in these materials, the small volumes of organic material are exposed to oxygen. This can result in biological respiration or oxidation of the material resulting in the production of carbon dioxide.

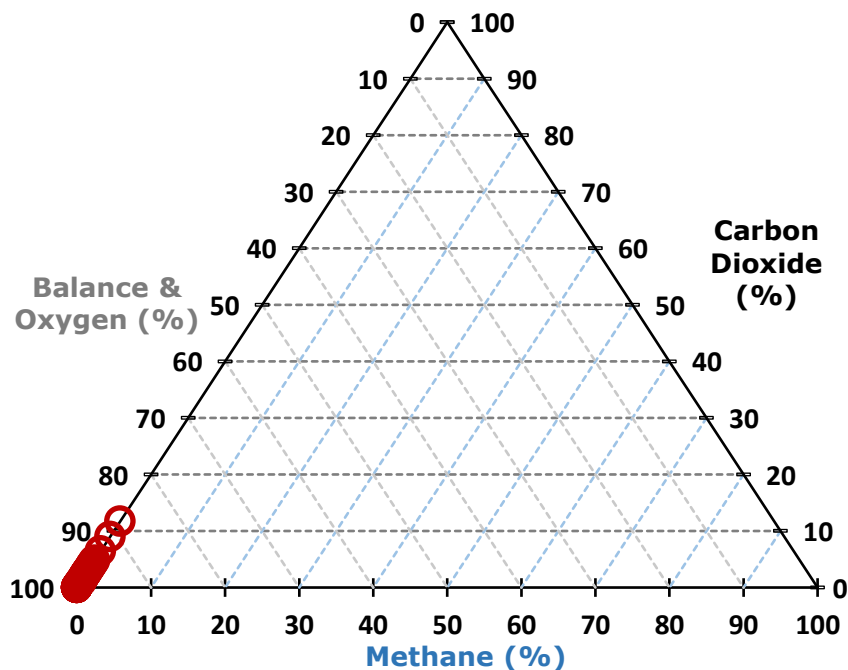
Low volumes of organic material in made ground can also degrade aerobically to produce carbon dioxide or may locally be degrading anaerobically with the process being so slow that the methane completely oxidises to carbon dioxide before reaching the well headspace. In all these cases the carbon dioxide is generated so slowly that it will not be emitted from the ground surface in quantities or at a rate that is sufficient to pose a risk to overlying development.

All of the commonly used screening approaches used in the UK for ground gas have a requirement to **consider** increasing the characterisation of a site identified as Characteristic Situation CS1 or Green based on the Gas Screening Value, if carbon dioxide concentrations exceeding 5% have been recorded.

This increase in characterisation is **not** a mandatory requirement in any of the guidance documents. The distribution of elevated concentrations and the source of the gas should be considered before deciding whether the increase is appropriate. The paper goes on to state that in most cases there will not be any need to increase the classification if the carbon dioxide is caused by biological respiration of small quantities of organic material. Increasing the characteristic situation is only likely to be a requirement if the gas source is one of the high-risk sources (landfills, open mine workings, flow of acidic mine water through rocks).

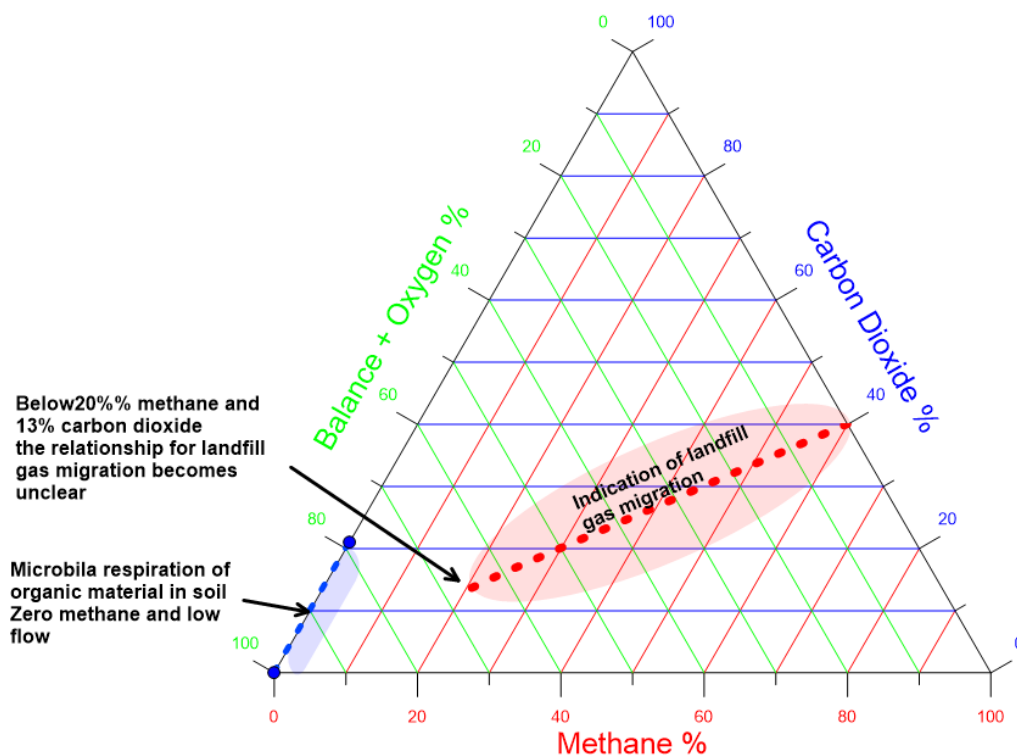
Based on the methodology described in the paper, a ternary plot has been produced using the monitoring and is presented below. Note that the results from WS101 have been omitted given these are not representative of the general made ground, rather a localised area of soft organic clay.

Figure 1: Ternary plot showing gas monitoring data



The distribution of the gas concentrations over the monitoring period fall within the area associated with microbial respiration of organic matter in soils in accordance with Wilson et. al. An extract is presented below for reference:

Figure 2: Ternary Plot Extract from Wilson et. al 2018



Where gas monitoring results plot in the zone for microbial respiration, there is no requirement to increase the characteristic situation simply because the carbon dioxide concentration exceeds 5%. This, as the

paper recommends, is supported by other data and lines of evidence such as the site conceptual model and continuous monitoring data.

Coal Mining Gas Risk Assessment - Deep Boreholes

As stated above, given the need to purge groundwater due to persistent flooding of the response zones of RO103 and RO104, the high steady-state ground gas flow rates are not considered representative of the ground gas regime beneath the site.

During the monitoring of RO103 and RO104, no methane has been detected and concentrations of carbon dioxide have ranged between 0.0% v/v and 4.0% v/v. Steady state gas readings have been consistently lower, ranging between 0.0% v/v and 1.2% v/v, suggesting that the presence of a ground gas monitoring well in itself is likely to be creating an artificial reservoir for accumulations of small quantities of ground gases.

In reality, the site is underlain by a significant thickness of low-permeability cohesive soils representing glacial Till, which is unlikely to provide any significant reservoir for potential accumulation of ground gases which could impact a redeveloped site. The installation of piles is unlikely to act as a significant pathway and the use of vibro improvement will likely improve the shallow soils as opposed to extending downward to the coal measures, thereby not becoming significant vectors for ground gas transport from the coal measures below.

Consideration should also be given to the extensive investigation into the possibility of mine workings which has been undertaken to date. A total of 12 rotary boreholes have been drilled on site, all either within or in immediate proximity to the proposed building footprint, none of which have encountered any evidence of mine workings such as loss of flush, soft drilling etc, therefore there is no evidence to suggest that shallow mine workings exist beneath the site. In any case, the high groundwater table at the site means that any deeper workings which may be present, and have not been investigated for geotechnical purposes due to their substantial depth, are highly likely to be flooded which reduces the potential for piston-style pumping as a mechanism for ground gas migration to negligible levels beneath the site. The closest recorded mine entry is located circa 45m away from the site but significantly further away from the proposed building, therefore the potential for recorded mine entries to act as potential migration pathways for ground gases is considered negligible.

Based on the monitoring dataset and conceptual site model, the overall risk from mine gases impacting the site is considered to be low and no mitigation with respect to mine gases is considered necessary.

Ground Gas Risk Assessment Summary

In summary, based on a lines of evidence approach, **we consider that the site should be placed within Characteristic Situation 1 (CS1) and ground gas protection measures are not required** within structures at the development, subject to agreement with the Local Authority, based on the following rationale:

- The available data set exceeds the minimum requirements suggested by the guidance for assessment.
- It is considered that the ground gas concentrations and flows have been monitored to enable a predication of “worst case” conditions; rapid and short pressure decreases are within the dataset.
- Although the methane concentrations place the site into CS2 based on the gas screening values, the levels are likely caused by the disturbance and oxygenation of the low organic content within the made ground.
- The organic made ground responsible for the methane concentrations is highly localised, has not been encountered elsewhere on site, and is therefore not representative of the ground conditions as a whole.
- Soft organic clays are geotechnically unsuitable and are likely to be removed anyway as part of the enabling works and earthworks programme likely to be required to create a development platform.
- The typical threshold concentration for carbon dioxide of 5% has been exceeded on a number of occasions within the spot monitoring data.

- Despite the carbon dioxide concentrations, the dataset as a whole is characterised by very low to negligible flow rates and low methane concentrations.
- However, based on the conceptual site model, likely generation sources and detailed assessment via ternary plots, the carbon dioxide concentrations are likely due to microbial respiration, where there is no requirement to increase the characteristic situation simply because the carbon dioxide concentration exceeds 5%.
- The gas flows from the rotary boreholes have been discounted due to the groundwater being above the response zone and creating a piston effect.
- Based on the evidence suggesting an absence of coal mining beneath the site, high ground water table, low permeability superficial deposits, and gas monitoring data, the overall risk from mine gases has been assessed as low.

Radon Risk Assessment

The Geotechnics Desk Study dated May 2022 indicated the property is located in an area where <1% of properties are at or above the action level. However, since the production of this report, the UK Health Security Agency and British Geological Survey (BGS) have published updated Radon mapping; publicly available data from UK Radon now suggests that the property is located in a 1km grid-square where the maximum radon potential is 3-5%.

Therefore, BSL have obtained a detailed BGS Radon Report, which is a significantly higher-resolution dataset, and shows the area of the site over which new buildings are to be constructed lies within an area where <1% of properties are above the Action Level. Therefore, the overall risk from Radon is low and no further action is required.

The BGS Report is presented in Appendix G.

8.8 Qualitative Risk Assessment

The CSM has been revised based on the findings of the site investigation and laboratory testing results and these are presented overleaf.

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
On site Made Ground associated with former railway development. Metals, PAH's, asbestos, Petroleum Hydrocarbons	Direct contact, inhalation of dusts	End-users	Low likelihood	Medium	Moderate/low	From the testing of made ground undertaken by BSL and Geotechnics, exceedances of heavy metals and PAHs have been detected within the made ground. In this instance, residential without homegrown produce has been selected for the initial screening criteria due to the nature of the development. The contamination has been encountered mostly in the east section of the site and is likely attributed to the made ground associated with the historical railway development. The proposed development shows that this area of the site will mostly be covered in MUGA pitches, these are typically astroturf/artificial cover and therefore will act a barrier for any contamination within the made ground and as such a pathway is not likely in these areas. Although if there are any areas of general soft landscaping, a pathway could exist between the contamination and end-users. Therefore, the risk is considered to be moderate/low.
On site Made Ground Metals and organic contamination	Migration into/chemical attack of water supply pipelines	Water Pipelines / End users	Likely	Medium	Moderate	Contaminants within the soil/groundwater could potentially attack the clean potable water supply pipe, contaminants should be assessed in accordance with the relevant guidance to determine the correct pipe material and level of precautions required.
Made Ground Ground Gas (carbon dioxide and methane)	Migration into confined spaces, inhalation and asphyxiation/explosion	End-users / property / structures	Unlikely	Medium	Low	Made ground is present onsite but is unlikely to be a significant source based on the encountered depths, lack of significant concentrations of putrescible or organic material, etc. The ground gas monitoring data is characterised in general by low flow rates, low methane although concentrations of carbon dioxide exceeding 5% have been encountered on a number of occasions. Very high methane concentrations have been recorded in WS101, however this is associated with a soft organic clay and is highly localised having not been recorded elsewhere on site. The disturbance of the ground and the act of introducing oxygen to the strata has likely contributed to oxygenation of the organic matter within the made ground, resulting in the locally high methane concentrations. This environment is not likely to be able to be recreated naturally and therefore the methane concentration is likely to be an artificial result of the borehole installation. In addition, this material will be geotechnically unsuitable for retention on site and will likely be removed during the enabling works and earthworks programme. Detailed assessment into the elevated concentrations of carbon dioxide indicates the source is likely biogenic respiration in the form of microbial activity, which is

Human Health						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
						unlikely to result in high flows or accumulations of ground gases to harmful concentrations. Furthermore, as the majority of the site is underlain by impermeable cohesive deposits, it is not suitable as a reservoir for storing ground gases and accumulation of gases in significant concentrations is unlikely to occur. Based on the detailed risk assessment carried out, the overall risk from ground gases is considered to be low.
Onsite Bedrock Geology – Coal Measures.	Migration into confined spaces, inhalation and asphyxiation/explosion	End-users / property / structures	Unlikely	Medium	Low	Two monitoring wells were installed within the bedrock strata (RO103 & RO104). Some high flow readings were recorded within the deep rotary open boreholes but as the groundwater was recorded above the response zone in both of these, these flows can be attributed to a piston effect of the groundwater rising, further increased by the purging of the groundwater which took place during each visit. Due to this, the flows from RO103 and RO104 are not considered representative of the bedrock geology, and this means a GSV cannot be calculated. The concentrations of methane and carbon dioxide recorded in these wells were both low. In addition to the monitoring data, no evidence of coal workings was encountered and the high groundwater table means any deeper workings are highly likely to be flooded. There are also no mine entries on or close to the site. Based on the monitoring dataset and conceptual site model, the overall risk from mine gases impacting the site is considered to be low and no mitigation with respect to mine gases is considered necessary.

Controlled Waters						
Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk	Justification
Made Ground PAH's, Metals	Overland flow, / migration through saturated zone	Unnamed Inland River 130m E (Surface waters)	Unlikely	Medium	Low	It is considered contaminants associated with the made ground and other past industrial uses are unlikely to impact the River. This is due to the low permeability of the clays underlying the area, which will inhibit lateral migration, and the potential for contaminants to attenuate and degrade over this distance. Therefore, a low risk is posed to the river from the made ground.
	Leaching through unsaturated zone / Migration through saturated zone	Secondary Undifferentiated/ Secondary A Aquifer (Ground-water)	Unlikely	Medium	Low	Although elevations of both PAHs and heavy metals have been detected within the made ground in the east section of the site, it is unlikely to impact controlled waters. Typically, the made ground is underlain by cohesive deposits and therefore this will reduce migration potential of contaminants, furthermore the site is not within a source protection zone and there are no groundwater abstractions within 200m of the site. Groundwater testing has been undertaken as part of the Geotechnics investigation, which revealed elevations in Copper, Iron, Lead, Manganese, Nickel, and Zinc, although Geotechnics' assessment suggests these are typical of natural background concentrations. No gross contamination has been observed on site. Therefore, the risk is considered to be low.
	Migration through saturated zone	Secondary A Aquifer (Ground-water)	Unlikely	Medium	Low	Bedrock across the site is overlain by impermeable natural clay strata which will likely break the pathway from any contamination migration downwards from the made ground. In addition, the new development will likely result in betterment of drainage and will therefore reduce leaching into the saturated zone. In any case, the existing groundwater quality within the Coal Measures is likely to be of low quality due to historical workings in the surrounding area, and the absence of any gross contamination means it is likely to be disproportionately costly to remove contaminants from the groundwater given the site's setting and potential receptors.

8.9 Outline Remedial Measures

Where soft landscaping areas are present (not including MUGA pitches) a cover of “clean” subsoil and topsoil should be provided to break the pathway to site end users. This should be 450mm thick in in soft landscaping areas in accordance with BRE 465. This will allow plants to be grown and prevent undesirable soils being brought to the surface.

Prior to import or re-use of clean cover soils, they should be tested to confirm chemical suitability. After installation of the clean cover, soil depths should be verified by a suitably qualified independent geo-environmental engineer, such as BSL.

The inclusion of a cover system containing a degree of cohesive material, together with the hard cover supplied by the proposed development, will have the effect of reducing rainfall infiltration and consequently contributing to a general betterment of groundwater and surface water quality.

Utilities

The level of protection for the clean potable water supply pipes should be determined using the local water company risk assessment criteria in accordance with UKWIR.

As the site is brownfield, there is the assumption that barrier pipe would be utilised, although requirements should be confirmed by risk assessment and with the water supply company.

Ground Gas Protection Systems

Based on the ground gas monitoring results, no mitigation measures are required and no radon protection is required for new buildings at this location, subject to the anticipated removal of the organic made ground material encountered locally in the vicinity of WS101 in the proposed building footprint, during the earthworks programme.

General

It is recommended that the approval of the Regulators (Local Authority / Environment Agency) is obtained in regard to the above prior to any irrevocable action is taken at the site.

Once the above bodies have approved the above outline remedial proposals, a Remedial Strategy will need to be produced to meet planning requirements and submitted to the regulatory authorities for approval. This will also give guidance to enable a suitably qualified contractor to carry out the works.

In addition, the writing and approval of a Materials Management Plan (MMP) or suitable exemptions/permits will be required to allow re-use of suitable material at the site.

A watching brief is recommended during groundworks for any unidentified sources of contamination. If any gross contaminated material is encountered works should cease in that area and BSL consulted.

Once remediation is complete, verification reports will need to be produced by a suitably qualified independent geo-environmental engineer, such as BSL, in order to achieve regulatory sign off.

8.10 Health and Safety Issues

During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Made Ground (heavy metals, PAHs, petroleum hydrocarbons)	Ingestion, direct contact, inhalation of dusts.	Construction Workers	Likely	Mild	Moderate/low
Asbestos	Ingestion, direct contact, inhalation of dusts.	Construction Workers	Unlikely	Medium	Low
Ground gas	Inhalation in confined spaces/trenches	Construction Workers	Unlikely	Medium	Low

The risk from made ground will be mitigated by standard PPE including gloves. Welfare facilities should be made available to wash before hand to mouth activities.

It is noted that concentrations of carbon dioxide (an asphyxiant) in the soil exceed HSE Workplace Exposure Limits for personnel in the working environment of 1.5% for short term (15 minutes) exposure and/or 0.5% for long term exposure. Furthermore, soil concentrations of oxygen are below the HSE recommendations of 18%.

Soil gas concentrations are not necessarily reflected by those in the breathing zone, all contractors and maintenance workers should be made aware of the possible presence of carbon dioxide and should take all necessary health and safety precautions when working in trenches or confined spaces. It should be noted that the vast majority of construction works will take place in external and/or well ventilated areas, in which cases the risk from ground gases would be negligible.

General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

8.11 Asbestos

The investigation of asbestos issues within structures was beyond the scope of this report. However, guidance from UK Government indicates that asbestos should be assumed to be present in buildings unless proven otherwise.

Any asbestos within structures will require removal prior to re-development. This will need to be done by a suitably qualified experienced and licensed contractor, who ensures that adequate PPE is provided to operatives, and that all the relevant legislation is adhered to.

Excavations in soils containing asbestos should comply with the CL:AIRE publication 'Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials' (CARSOIL) and CAR 2012. All such works will need to be agreed with the regulatory bodies (HSE and/or LA).

Additional guidance is provided within the BSL methodology Guidance Note in Appendix A.

9.0 WASTE SOIL CLASSIFICATION & ASSESSMENT

9.1 Summary

BSL have undertaken a preliminary assessment of potential excavation waste to arise from the site during redevelopment to:

- Classify the excavation waste to arise as either hazardous or non-hazardous.
- Identify the most sustainable options for the wastes to arise in accordance with the waste hierarchy.
- Provide a written description of the waste required as part of the Duty of Care.
- Provide details of “hazardous properties” to complete hazardous waste consignment note (where applicable).
- Be able to provide a basic classification report to a landfill operator (where waste is destined for landfill disposal).

9.2 Waste Classification Procedure

As described in the ‘Waste Duty of Care Code of Practice (2016)’ any substance or object that the holder discards, intends to discard or is required to discard is a waste. It is the responsibility of the waste producer to classify this waste. The classification process is described in the ‘Guidance on the classification and assessment of waste’ WM3 and aims to determine whether the waste is Hazardous or Non-Hazardous to human health and the environment.

Hazardous wastes are signified by entries where the code is followed by an asterisk, where some wastes are deemed hazardous without further assessment, which are termed “Absolute Entries” e.g. most waste oils. Alternatively, waste entries are termed “Mirror” entries that require further assessment of hazardous properties, in order to determine whether they are hazardous waste or not (e.g. soil and stones). The EWC codes relevant to excavation wastes are:

- 17 05 03* - soil and stones containing dangerous substances.
- 17 05 04 – soil and stones other than those mentioned in 17 05 03.

The Landfill Directive (Directive 1999/31/EC on the landfilling of waste, Decision 2003/33/EC and Landfill Regulations 2005) led to the establishment of a methodology for classifying wastes.

Wastes first need to be classified based on their total concentrations and classified as either hazardous or non-hazardous waste. WAC testing is only required if the end disposal route is a landfill and WAC analysis must not be used for waste classification.

Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. A waste must comply with the WAC limits for the relevant landfill, otherwise the soil will need to be pre-treated. There are three different WAC criteria, these are:

- Inert waste.
- Stable Non-Reactive Hazardous Waste (SNRHW).
- Hazardous waste.

There are no standard set of WAC limits for non-hazardous landfill sites and each non-hazardous landfill will have its own set of criteria under which it is licenced to accept non-hazardous waste. These will need to be determined through the selected waste receiver prior to disposal.

A non-hazardous waste should not be compared with WAC limits for hazardous or SNRHW waste sites and the WAC test should only be used to determine if the waste is suitable for disposal at an inert waste landfill site. Likewise, wastes classified as hazardous based on their total concentrations should not be compared with WAC limits for inert waste landfill sites, as these will not be accepted.

Details of how material should be classified for waste disposal are presented in the BSL Methodology and Guidance in Appendix A and are summarised in the table below:

Classification based on Total Concentrations ¹	PRIOR TO LEAVING SITE			
	Non-Hazardous Waste		Hazardous Waste	
	IF SOILS CANNOT BE RE-USED ELSEWHERE AND MUST GO TO LANDFILL			
WAC testing	Below inert WAC limit values	Above inert WAC limit values	Below hazardous WAC limit values ⁴	> WAC limit values
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill ²	HAZARDOUS landfill	PRE-TREATMENT ³

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).

2 Individual sites may have certain limit values pre-determined in their licence.

3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

4 Possibility that wastes could be classified as stable Nonreactive HAZARDOUS waste in non-hazardous Landfill (e.g. soils containing low concentrations of asbestos, gypsum or sulphate bearing soils).

Waste classified as non-hazardous can be accepted into a non-hazardous landfill without having to pass any numerical WAC.

Soils above hazardous WAC limit values require pre-treatment prior to disposal. The effective pre-treatment, typically involving separation, sorting and screening, can offer cost savings through reducing the hazardous nature and volumes of soil. Costs for disposal of non-hazardous/hazardous soils are significant compared to the disposal of inert material.

Inert Waste

The possibility of automatic inert classification of the naturally occurring “clean” soils should be explored in accordance with Section 4.3 of the EA guidance document. The Council Decision includes a list of wastes in Section 2.1.1 of the document that are assumed to be inert and therefore acceptable at a landfill for inert waste without testing. This is the case if:

- They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source); and
- There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other classes of landfill.

9.3 Waste Classification and Waste Acceptance Criteria (WAC)

We have reviewed the testing results and assessed them through a waste classification database which allows users to code and classify waste as defined in the EWC (European Waste Catalogue) based on EC Regulation 1272/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (CLP) and latest Environment Agency guidance (WM3 “Guidance on the classification and assessment of waste - Technical Guidance”).

The samples tested were screened against assessment criteria within WM3 using the HazWasteOnline tool to assess whether they contained any contaminants in the hazardous range.

The Waste Classification Report and WAC testing results is presented in Appendix F. The results of the waste assessment based on total concentrations are presented in the table below, alongside the WAC analysis test results.

Location	Depth (m)	Stratum	Waste Classification	WAC Analysis	Landfill	Comments
BSL Testing						
WS101	0.20-0.60	MADE GROUND	Non-hazardous	Below Inert WAC limit values	INERT landfill	-
WS103	1.50	MADE GROUND	Non-hazardous	-		-
WS106	0.15-1.20	MADE GROUND	Hazardous	Below Hazardous WAC limit values	HAZARDOUS Landfill	pH - corrosive
TP101	0.00-0.20	MADE GROUND	Non-hazardous	-		-
TP103	0.00-0.20	MADE GROUND	Non-hazardous	-		-
TP106	0.40-1.25	MADE GROUND	Non-hazardous	-		-
TP108	0.10-1.00	MADE GROUND	Non-hazardous	Exceeds Inert WAC limit values	NON-HAZARDOUS landfill	Loss on Ignition
HP101	0.30-1.10	MADE GROUND	Non-hazardous	-		-
Geotechnics Testing						
BH01	0.50	Gravelly SAND	Non-hazardous	-		-
BH02	0.50	MADE GROUND	Non-hazardous	-		-
BH03	0.50	MADE GROUND	Non-hazardous	-		-
BH03	2.00	Gravelly SAND	Non-hazardous	-		-
BH03A	2.00	Gravelly SAND	Non-hazardous	-		-
BH04	1.00	MADE GROUND	Non-hazardous	-		-
HD01	1.00	MADE GROUND	Non-hazardous	-		-
HD02	0.50	MADE GROUND	Non-hazardous	-		-
HD03	1.00	MADE GROUND	Non-hazardous	-		-
HDP04	0.50	MADE GROUND	Non-hazardous	-		-
DCP05	0.50	MADE GROUND	Non-hazardous	-		-
DCP07	0.20	MADE GROUND	Non-hazardous	-		-
DCP08	0.20	MADE GROUND	Non-hazardous	-		-
DS01	0.50	MADE GROUND	Non-hazardous	-		-
DS04	0.50	MADE GROUND	Non-hazardous	-		-
DS05	0.50	MADE GROUND	Non-hazardous	-		-

Based on the waste classification database assessment, the majority of the made ground soils have been classified as **non-hazardous**, with the exception of WS106 which was classified as hazardous due to pH. This is possibly due to the concrete observed within the made ground comprising brownish grey sandy gravel, from which the sample was taken. During sample preparation a grinder is used which would grind any sand or gravel sized fragments within the sample, including concrete, to a fine powder. This fine powder has a much larger surface area, exposing increased amounts of calcium hydroxide, potentially skewing the pH of the soil mass. As a result this may be representative of the made ground strata as a whole, however re-testing and re-classification would be required on the actual arisings prior to disposal off site.

WAC testing suggests that the cohesive made ground (sampled in WS101) should be suitable for disposal at an inert landfill site, whereas the granular made ground (sampled in TP108) should be suitable for disposal at a Non-Hazardous landfill site, likely due to the relatively high ash content within the granular made ground in the eastern area of the site.

Alternatively, given the earthworks required on site, re-use of suitable soils is likely to be more cost-effective than disposal to landfill, and options are discussed in full in section 9.5.

Note that further testing of the soils (WAC testing) may be required on the actual arisings in order to satisfactorily categorise the soil for its suitability for disposal to landfill.

9.4 Options Assessment

Following the classification of waste materials, the options available for the waste can be considered in the context of the waste hierarchy as below:

- Onsite re-use (with or without prior treatment) under suitable exceptions/permits.
- Offsite processing for recycling or recovery e.g. screening.
- Offsite disposal (with or without prior treatment) i.e. landfill.

Where feasible, efforts should be made to retain soils for onsite re-use to minimise costs and maximise the sustainability of projects.

Based on the above, the possible options for the generation of waste soils at the site are described in the table below:

Waste Generation Source	Comments
Crush	Crushed concrete is/will be site derived from structures which had not been used for potentially contaminative activities. These should be subject to an asbestos survey and removal of asbestos as required, prior to demolition and crushing of structures. Assuming the above criteria are met, with materials containing no asbestos or ACM, crushed concrete is considered to be inert without testing. Where samples of crushed concrete have been subject to totals testing this is likely to be hazardous due to pH, and where subject to WAC testing, the sulphate and TDS limits are breached, this is to be expected due to the presence of concrete.
Made Ground from site levelling/foundations excavations/services excavations.	Samples of made ground from across the site have been classified as non-hazardous and hazardous for off-site disposal purposes, although should be suitable for re-use on site if required under suitable exemptions/permits. But it should be noted that elevations of PAHs and heavy metals have been detected in the made ground and therefore may not be suitable for reuse.
Natural ground from site levelling/foundations excavations/services excavations	The Till may be considered suitable for re-use onsite as fill where the criteria of the WFD exception for re-use of naturally occurring soils can be met. Naturally occurring clean materials could also be exported to another site under the direct transfer scenario of the DoWCoP.

General

If any gross hydrocarbon contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

Where it is necessary to dispose material off site it is recommended that materials are segregated and sufficient time is allowed to further classify the actual soil arisings that constitute the waste, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is illegal to dilute and mix soils without a suitable permit.

9.5 Re-use of Soils

By definition in law, any material excavated from the ground becomes waste at the moment of excavation. If that soil (now a “waste”) is then placed on another part of the development site (or used on another development site) without an appropriate materials management plan, permit or exemption being in place, by law this material is defined as “illegally deposited waste”.

Landfill tax rules allow HM Revenue & Customs (HMRC) to recover landfill tax on illegally deposited waste on construction sites. This could lead to excessive costs without the correct documentation in place. In addition, a person who makes, knowingly causes or knowingly facilitates a disposal to be made at an unauthorised site is also liable to pay Landfill Tax.

In order to comply with UK legislation and avoid excessive costs, if the re-use of soils is proposed on site, this should be done in accordance with the relevant exemptions or permits in place.

Soils Re-use Under DoWCoP

One of the main industry mechanisms for allowing the re-use of soils in construction is the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE DoWCoP) also known as a Materials Management Plan (MMP). Further guidance is provided in the BSL Methodology and Guidance in Appendix A.

To implement the DoWCoP (for Route A), there is a requirement to notify the Environment Agency and Local Authority of the intention to use the code of practice in principal, after which there is a 21-day notice period for their response.

In order to re-use soils under the DoWCoP, there are four key criteria that need to be met:

-
- The aims and objectives of the project meet the requirements of the Waste Framework Directive (does not harm human health or the environment).
 - The soils can be demonstrated to be suitable for use (backed up by chemical/geotechnical testing and assessment).
 - There is certainty of use (planning consents are in place alongside materials tracking, which should be in place as part of good site practice in any case).
 - Quantity (the quantity of materials used should be known).
-

Information on existing site levels, proposed levels, volumes generated (e.g. foundation / drainage excavation arisings) would need to be known in order to complete the MMP.

If the DoWCoP is the chosen route, the MMP should be in place and declared by a Qualified Persons (QP) before works commence, otherwise excavated soils could constitute an illegal deposit of waste and enforcement action could be taken by the EA and HMRC.

The declared MMP should be amended as new import sources are added.

Once the project is complete, a verification report detailing soils re-use/import will need to be produced and submitted to CL:AIRE, which may be subject to a random audit process. Sites found to be non-compliant with the CoP can be referred to the EA for further investigation.

Regardless of implementing re-use under the code of practice or not, all sites should have some form of materials tracking in place in compliance with current legislation. Any re-use scheme should also be designed to minimise disposal costs.

Re-use of soils containing asbestos should comply with the CL:AIRE publication ‘Interpretation for Managing and working with Asbestos in Soil and Construction and Demolition Materials’ (CAR-SOIL™) and CAR 2012.

In terms of the re-use of brick/concrete crush materials, the DoWCoP does cover aggregates, but only on the site of origin, and the EA WRAP aggregate Quality Protocol might best apply to ensure quality standards, which are discussed further below.

Soils Re-use under Exemptions and Permits

Other potentially suitable options to allow the re-use and/or import of soils and aggregates on site are provided in the table below:

Re-use Mechanism	Description
U1 Exemption	Can be applied to re-use/import of soils and stones, but only up to 1000 tonnes or for brick and concrete up to 5000 tonnes. This is usually an efficient way to re-use small volumes of waste materials. However, only one U1 can be filled in per site in any 3-year period. Quick and free via online registration.
WRAP Quality Protocols	Describes how processed demolition arisings can be removed from regulatory waste regime. Requires a demonstration of appropriateness by: • Factory Production Control Manual. • Facility Permit (or Exemption). • Grading Analysis.
Waste Framework Directive (WFD) exclusion	In regard to “clean” naturally occurring soils only that are to be re-used on their site of origin, these are covered by a Waste Framework Directive (WFD) exclusion which is an EA regulatory position statement. So long as the project can prove the four criteria listed above for the DoWCoP, then permits or the DoWCoP are not required. However, many projects still use the CoP to ensure compliance.
T5 Screening and blending of waste	The T5 exemption allows you to temporarily treat waste on a small scale to produce aggregate or soil at a particular location, such as a construction or demolition site. The limit is 5,000 tonnes. This applies to: • Screening soil on a demolition site to remove wood and rubble. • Blending soil and compost that has been produced under an exemption on a construction site to produce better soil for landscaping on that site (e.g. peaty deposits). • Crushing waste (except bricks, tiles and concrete) before screening or blending • Grading waste concrete after it has been crushed to produce a certain type of aggregate.
T7 Exemption	The T7 allows treatment of waste bricks, tiles and concrete by crushing, grinding or reducing in size. This needs to be registered with the Local Authority.
Other Permitting Routes	Other options include use under an Environmental Permit (Standard or Bespoke Rules), however these may be a time consuming and costly route, where use of the other above options (if applicable) are likely to be more feasible in construction.

10.0 CONCLUSIONS

10.1 Geo-Environmental

Geo-Environmental – Human Health

Testing of the made ground at the site revealed relatively widespread exceedances of heavy metals and PAHs particularly in the eastern section of the site.

The above are considered to pose a risk to human health and remedial measures are required in the form of a cover system in soft landscaping areas to mitigate the risk.

Based on the gas monitoring and detailed assessment the site is classified as Characteristic Situation 1 and ground gas protection measures are not required.

Geo-Environmental – Controlled Waters

The overall risk to controlled waters is considered to be low and no further action is required.

Waste

Waste classification for the made ground at the site has revealed the majority of the soils to be non-hazardous, except for one of the samples which has been classified as hazardous due to the pH of the sample, possibly skewed due to the presence of concrete within the sample.

WAC testing suggests that the cohesive made ground (sampled in WS101) should be suitable for disposal at an inert landfill site, whereas the granular made ground (sampled in TP108) should be suitable for disposal at a Non-Hazardous landfill site, likely due to the relatively high ash content within the granular made ground in the eastern area of the site. However, efforts should be made to retain all soils on site where feasible to minimise costs and maximise sustainability.

10.2 Geotechnical

Foundations

Ground improvement by methods such as vibro ground improvement and/or vibro stone columns (VSCs) are considered suitable for structures. Reinforced pads and ground bearing slab foundations could be used bearing onto the improved ground, at depths of circa 600mm bgl. Allowable bearing capacities of the order of 150kN/m² can typically be achieved per pad.

Alternatively, a piled solution may be adopted, with the piles extending through the made ground and superficial deposits, utilising a combination of skin friction and end-bearing resistance. The profiles below have been split into different options dependant on the depth to rockhead which varies across the building footprint.

Profile	Assumed Depth to Bedrock (m bgl)	Pile Diameter (mm)	Pile Length (m)	Allowable Load (kN)
RO102, BH03A, RO105, RO106, BH04	12	300	14.00	430
		500	14.00 ^[1]	840
		750	14.00 ^[1]	1450
RO103, RO104, RO107	17	300	18.50	490
		500	18.50 ^[1]	940
		750	18.50 ^[1]	1600
RO101, RO108, BH02	20.5	300	22.00	560
		500	22.00 ^[1]	1050
		750	22.00 ^[1]	1800

Floor slabs

Suspended floor slabs supported by piles or ground bearing floor slabs may be adopted provided the criteria in section 7.5 are satisfied

Concrete classification

DS1 AC-2s conditions prevail in the made ground. DS1 AC-1 conditions prevail in the natural superficial strata.

Highways

Based on the ground conditions encountered, the following CBR values are likely to be achievable.

-
- Made Ground CBR – 2%.
 - Superficial Strata CBR – cohesive/fine soils–2%
 - Superficial Strata CBR – granular/coarse soils– 5%
-

The above should be confirmed by in-situ testing at formation level by a specialist geotechnical engineer during construction.

Drainage (SUDS)

Drainage to soakaways is considered potentially unsuitable for this site.

Earthworks

Given the variability of existing site levels and development layout requirements including finished levels, earthworks will be required in order to achieve the desired development platform levels. A separate Earthworks Specification will be issued under a separate cover.

Mining

The risk from shallow unrecorded mine workings affecting the new building construction is considered to be low and no further action is required.

However, geogrid installation would be prudent within external areas of proposed hardstanding highways and car parking located in the Coal Authority Development High Risk Area where borehole coverage is limited.

10.3 Further Work

The following further work is considered necessary to progress the site to construction phase:

-
- Demolition Asbestos survey.
 - Tree survey by qualified arboriculturist.
 - Detailed foundation design by a structural engineer, including foundation zonation plan and depth schedule.
 - Production of Earthworks Specification.
 - Design of Remedial Strategy and confirmation with the Local Authority /EA / NHBC.
 - Production of Materials Management Plan (MMP) under the CL:AIRE DoWCoP, if required.
 - Implementation of the Earthworks, Remedial Strategy and verification of the works.
-

11.0 ABBREVIATIONS AND DEFINITIONS

GLOSSARY	
Term / Abbreviation	Definition
AST	Above Ground Storage Tank.
B(a)P	Benzo (a) Pyrene.
BGS	British Geological Survey.
BRE	Building Research Establishment.
BS	British Standard.
BSL	Brownfield Solutions Ltd.
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes.
CBR	California Bearing Ratio (used in pavement/highways design).
CAR 2012	Control of Asbestos Regulations (2012).
CBCB	Cheshire Brine Compensation Board.
CBCD	Cheshire Brine Compensation District.
CBR	California Bearing Ratio.
CIEH	Chartered Institute of Environmental Health.
CIRIA	Construction Industry Research Association.
CL:AIRE	Contaminated Land: Applications in Real Environments.
CLEA	Contaminated Land Exposure Assessment.
CLO	Contaminated Land Officer.
COMAH	Control of Major Accident Hazards.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. There is no assumption in this definition that harm results from the presence of the contamination. Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. Contamination may relate to soils, surface water, groundwater or ground gas.
Controlled Waters	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three-mile limit of territorial waters.
CPT	Cone Penetration Test.
CSM	Conceptual Site Model. A schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. The conceptual site model is initially derived from the information obtained by the preliminary investigation (i.e. the Phase I Desk Study). This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of intrusive investigations can provide additional data that can be used to further refine the conceptual site model.
DCP	Dynamic Cone Penetrometer.
DNAPL	Dense Non-Aqueous Phase Liquid.
DoWCoP	Definition of Waste Code of Practice.
DWS	Drinking Water Standard.
EA	Environment Agency.
EHO	Environmental health Officer.
EQS	Environmental Quality Standard.
GAC	Generic Assessment Criteria.

GLOSSARY	
Term / Abbreviation	Definition
GDR	Geotechnical Design Report.
GFR	Geotechnical Feedback Report.
GIR	Ground Investigation Report.
GSV	Gas Screening Value.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case of human health, including property/structures and water supply pipelines.
Hazard	Inherently dangerous quality of a substance, procedure or event.
HDPE	High Density Polyethylene.
HSV	Hand Shear Vane.
K	Modulus of Subgrade Reaction.
LCRM	Land Contamination: Risk Management (EA guidance).
LNAPL	Light Non-Aqueous Phase Liquid (petrol, diesel, kerosene).
LOD	Limit of Detection (for particular method adopted).
MMP	Materials Management Plan.
Mv	Modulus of Volume of Compressibility.
ND	Not Detected.
NHBC	National House Building Council.
NR	Not Recorded.
OS	Ordnance Survey.
PAH	Polycyclic Aromatic Hydrocarbon.
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
PCB	Poly-Chlorinated Biphenyl.
PCSM	Preliminary Conceptual Site Model.
pH	Scale used to specify how acidic or basic a water-based solution is.
PHC	Petroleum Hydrocarbons.
PID	Photo Ionisation Detector.
PNEC	Predicted No-Effect Concentration.
Precision	Level of agreement within a series of measurements of a parameter.
PSD	Particle Size Distribution.
PVC	Polyvinyl Chloride.
Receptor	Human health, living organisms, ecological systems, controlled waters (surface waters and groundwater within aquifers), atmosphere, structures and utilities that could potentially be adversely affected by contaminant(s).
Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk Assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
SOM	Soil Organic Matter.
Source	Location from which contamination is, or was, derived. This could possibly be the location of the highest soil, groundwater or gas concentration of the contaminant(s).
SPT	Standard Penetration Test.
SVOCs	Semi Volatile Organic Compounds.
TOC	Total Organic Carbon.
TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group).

GLOSSARY	
Term / Abbreviation	Definition
TVOCs	Total volatile organic compounds.
UCS	Unconfined Compressive Strength.
Uncertainty	Parameter, associated with the result of a measurement that characterises the dispersion of the values that could reasonably be attributed to the measurement.
UST	Underground Storage Tank.
UXO	Unexploded Ordnance.
VCCs	Vibro Concrete Columns.
VSCs	Vibro Stone Columns
VOCs	Volatile Organic Compounds.
WAC	Waste Assessment Criteria.
WFD (in waste context)	Waste Framework Directive.
WFD (in water context)	Water Framework Directive.
Units	Definition
°	Degrees
Φ	Phi angle (in degrees)
g/l	Grams per Litre
Km	Kilometres
kPa	Kilo Pascal (Equivalent to kN/m ²)
KN/m ² /mm	Kilo Newton per metered squared per millimeter
kN/m ²	Kilo Newtons per metre squared
kPa	Kilo Pascal (Equivalent to kN/m ²)
l/hr	Litres per hour
MJ/kg	Mega joule per kilogram
MN	Mega Newton
M ² /MN	Mega Newton per metre squared
M	Metres
m bgl	Metres Below Ground Level
m OD	Metres Ordnance Datum (sea level)
µg/l	Micrograms per Litre (parts per billion)
µm	Micrometre
mb	Millibars (atmospheric pressure)
mg/kg	Milligrams per kilogram (parts per million)
mg/m ³	Milligram per metre cubed
mm	Millimetre
ppb	Parts Per Billion
Ppm	Parts Per Million

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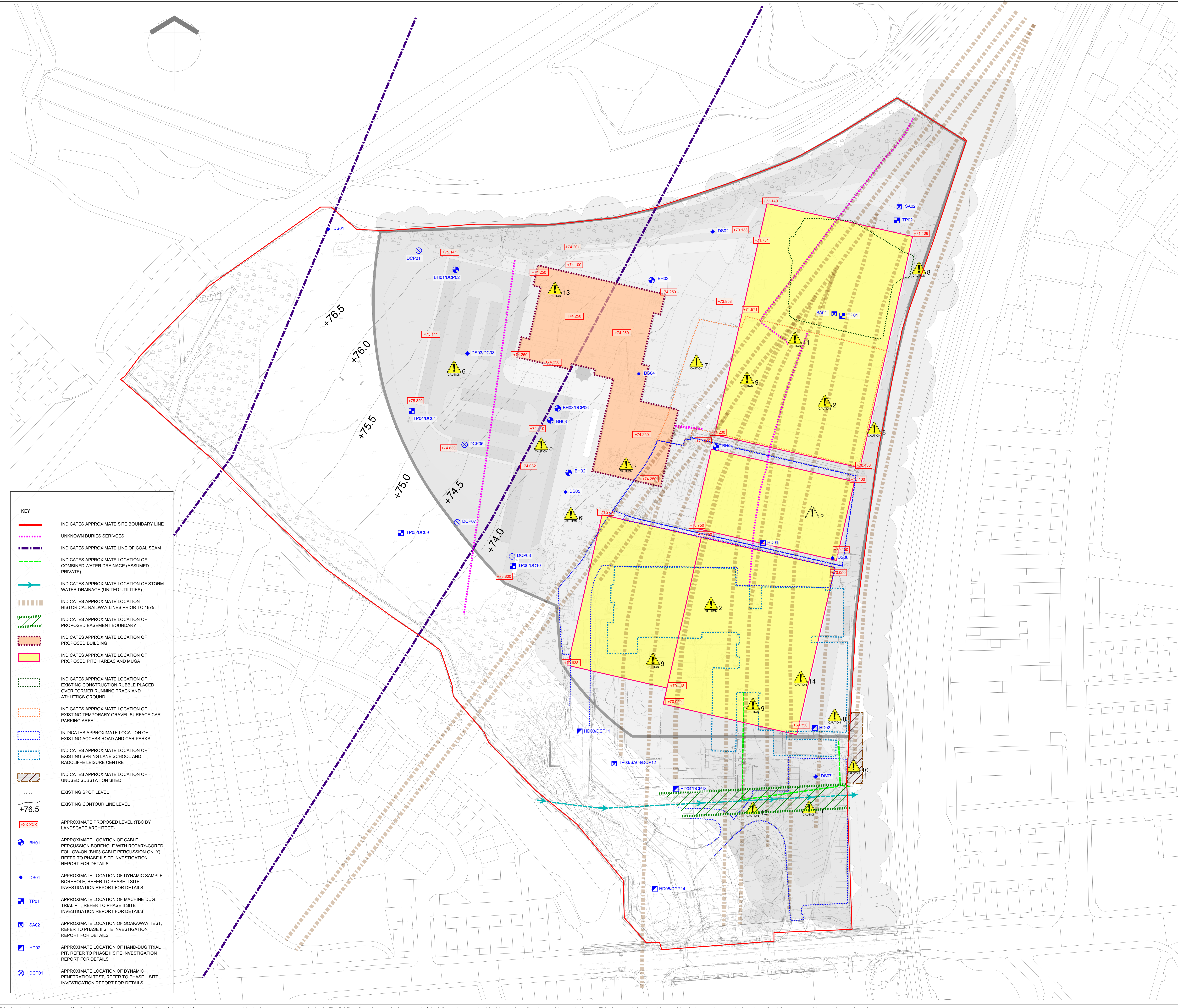
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DRAWINGS



KEY

INDICATES APPROXIMATE SITE BOUNDARY LINE

UNKNOWN BURIES SERVICES

INDICATES APPROXIMATE LINE OF COAL SEAM

INDICATES APPROXIMATE LOCATION OF COMBINED WATER DRAINAGE (ASSUMED PRIVATE)

INDICATES APPROXIMATE LOCATION OF STORM WATER DRAINAGE (UNITED UTILITIES)

INDICATES APPROXIMATE LOCATION HISTORICAL RAILWAY LINES PRIOR TO 1975

INDICATES APPROXIMATE LOCATION OF PROPOSED EASEMENT BOUNDARY

INDICATES APPROXIMATE LOCATION OF PROPOSED BUILDING

INDICATES APPROXIMATE LOCATION OF PROPOSED PITCH AREAS AND MUGA

INDICATES APPROXIMATE LOCATION OF EXISTING CONSTRUCTION RUBBLE PLACED OVER FORMER RUNNING TRACK AND ATHLETICS GROUND

INDICATES APPROXIMATE LOCATION OF EXISTING TEMPORARY GRAVEL SURFACE CAR PARKING AREA

INDICATES APPROXIMATE LOCATION OF EXISTING ACCESS ROAD AND CAR PARKS

INDICATES APPROXIMATE LOCATION OF EXISTING SPRING LANE SCHOOL AND RADCLIFFE LEISURE CENTRE

INDICATES APPROXIMATE LOCATION OF UNUSED SUBSTATION SHED

XX.XX

EXISTING SPOT LEVEL

+76.5

EXISTING CONTOUR LINE LEVEL

XXXXXX

APPROXIMATE PROPOSED LEVEL (TBC BY LANDSCAPE ARCHITECT)

BH01

APPROXIMATE LOCATION OF CABLE PERCUSSION BOREHOLE WITH ROTARY-CORED FOLLOW-ON (BH03 CABLE PERCUSSION ONLY). REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

DS01

APPROXIMATE LOCATION OF DYNAMIC SAMPLE BOREHOLE, REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

TP01

APPROXIMATE LOCATION OF MACHINE-DUG TRIAL PIT, REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

SA02

APPROXIMATE LOCATION OF SOAKAWAY TEST, REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

HD02

APPROXIMATE LOCATION OF HAND-DUG TRIAL PIT, REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

DCP01

APPROXIMATE LOCATION OF DYNAMIC PENETRATION TEST, REFER TO PHASE II SITE INVESTIGATION REPORT FOR DETAILS

- GENERAL NOTES:
- 1

THIS DRAWING IS INTENDED TO OUTLINE THE KNOWN CIVIL AND STRUCTURAL ENGINEERING SITE CONSTRAINTS.
- 2

DO NOT SCALE FROM THIS DRAWING.
- 3

REFER TO THE FOLLOWING DOCUMENTS FOR FURTHER INFORMATION AND DETAILS:
- PHASE I GEO-ENVIRONMENTAL SITE ASSESSMENT REPORT REF: FS1013-GE0-XX-XX-T-3-001-PHASE1DESKSTUDY-S5-P01
- ISSUE MAY 2022 BY GEOTECHNICS
- PHASE II GEO-ENVIRONMENTAL SITE ASSESSMENT REPORT REF: FS1013-GE0-XX-XX-T-G-002-PHASE2-S5-P01
- ISSUE AUGUST 2022 BY GEOTECHNICS
- SITE TOPOGRAPHICAL SURVEY REF: FS1013-GE0-XX-XX-D-U-0002-TOPO_GPR_2D-S5-P01
- DRAWING NO. 42645, T1 ISSUED 21.01.2022 BY GREENHATCH GROUP
- UNDERGROUND UTILITY SURVEY REF: FS1013-SNGS-XX-XX-D-U-0002-TOPO_GPR_2D-S5-P01
- DRAWING NO. 42645, UG ISSUED 21.01.2022 BY GREENHATCH
- PRELIMINARY ARCHITECT DRAWING FS 1013-AHR-V1-00-DR-A-20001 REV P01 ISSUED 05.06.2023 BY AHR ARCHITECTS LTD
- PRELIMINARY LANDSCAPE ARCHITECT DRAWING REF: 805-ALA-ZZ-ZZ-SK-L-004 REVISION P01 ISSUED 30.06.2023 BY AREL LANDSCAPE ARCHITECTS LTD
- 4

ALL EXISTING BURIED SERVICES BELOW PROPOSED BUILDING TO BE IDENTIFIED AND GRUBBED OUT WITH EXCAVATIONS BACKFILLED WITH SUITABLE, WELL-COMPACTED MATERIAL BEFORE COMMENCING CONSTRUCTION WORK.
- 2

ALL EXISTING FOUNDATIONS AND HANDSTANDING TO BE GRUBBED OUT WITH EXCAVATIONS BACKFILLED WITH SUITABLE WELL-COMPACTED MATERIAL PRIOR TO CONSTRUCTION OF NEW PITCHES AND MUGA.
- 3

AN ASBESTOS SURVEY CARRIED OUT BY ETON ENVIRONMENTAL GROUP IN MAY 2022 IDENTIFIED THE PRESENCE OF ASBESTOS WITHIN THE EXISTING BUILDINGS. THIS WILL NEED TO BE CAREFULLY REMOVED BY A SPECIALIST PRIOR TO DEMOLITION WORKS.
- 4

THE GPR SURVEY INDICATES SEVERAL BURIED SERVICES SERVING THE EXISTING BUILDINGS TO THE SOUTH OF THE SITE. ALL APPROPRIATE ALLOWANCES TO BE CONSIDERED FOR DECOMMISSIONING AND REMOVING BURIED SERVICES WHERE NECESSARY.
- 5

THE PHASE I AND II GEO-ENVIRONMENTAL SURVEYS HAVE INDICATED THE PRESENCE OF COAL BENEATH THE SITE. A MORE EXTENSIVE GROUND INVESTIGATION IS REQUIRED TO VALIDATE THE PRESENCE OF ANY SHALLOW MINE WORKINGS.
- 6

THE TOPOGRAPHICAL SURVEY SHOWS THAT THERE IS A 0.7m LEVEL DIFFERENCE FROM ONE SIDE OF THE SITE TO THE OTHER. A CUT-AND-FILL EXERCISE WILL NEED TO BE CARRIED OUT TO DETERMINE THE PROPOSED LEVELS FOR THE SITE.
- 7

THE GROUND INVESTIGATION REPORTS INDICATE HIGH GROUNDWATER LEVELS, WHICH ARE AS SHALLOW AS 0.85m BGL IN PLACES. RELATED RISKS INCLUDE INSTABILITY OF FOUNDATION EXCAVATIONS AND ADDITIONAL MEASURES BEING IMPLEMENTED IN THE DESIGN OF FOUNDATIONS AND GROUND SLABS TO RESIST UPLIFT. CONTRACTOR TO MAKE AN ADEQUATE ALLOWANCE FOR MANAGING THE GROUNDWATER DURING THE CONSTRUCTION STAGE.
- 8

AN OPERATIONAL TRAM LINE IS PRESENT DIRECTLY ADJACENT TO THE EAST SIDE OF THE SITE. THE CONTRACTOR IS TO PUT IN PLACE SUITABLE MEASURES FOR WORKING IN PROXIMITY TO THE TRAM LINE AND LIAISING WITH TGM WHERE NECESSARY.
- 9

THE HISTORICAL MAPS INDICATE RAILWAY LINES PREVIOUSLY RUNNING ACROSS THE SITE, WHERE ENCOUNTERED, THESE WILL NEED TO BE GRUBBED OUT WITH EXCAVATIONS BACKFILLED WITH SUITABLE WELL-COMPACTED MATERIAL.
- 10

PURPOSE AND OWNERSHIP OF SUB-STATION TO BE DETERMINED AND PROTECTION MEASURES PUT IN PLACE IF NECESSARY, DURING DEMOLITION/CONSTRUCTION WORKS.
- 11

LINE OF EXISTING DRAINAGE RUNS IS UNKNOWN. ADDITIONAL CCTV AND SOND SURVEYS TO BE CARRIED OUT TO DETERMINE WHERE THE DRAINAGE SITS UNDER THE SITE TO ALLOW FOR SUITABLE PROTECTION MEASURES TO BE IMPLEMENTED BY THE CONTRACTOR AND ENSURE THAT A NEW DRAINAGE CONNECTION IS FEASIBLE.
- 12

THE EASEMENT TO THE PUBLIC SEWER WILL NEED TO BE CONFIRMED WITH UNITED UTILITIES TO ENSURE THAT THE LANDSCAPE ARCHITECT'S PROPOSALS AND CONSTRUCTION METHODOLOGY WILL NOT IMPACT ON THE OPERATION OF THE SEWER.
- 13

EXISTING TREES TO BE REMOVED AS PART OF THE PROPOSED DEVELOPMENT. THE EFFECTS THAT THIS HAS ON THE GROUND WITHIN THE INFLUENCE ZONE ON THE PROPOSED FOUNDATIONS WILL NEED TO BE FACTORED INTO THE DESIGN.
- 14

EXISTING SUBSTATION WITHIN INSURE CENTRE CONTRACTOR WILL NEED TO DEVELOP METHODOLOGY TO ENSURE THAT THIS IS RETAINED AND KEPT IN OPERATION AFTER THE REST OF THE EXISTING BUILDING IS DEMOLISHED.

PRELIMINARY ISSUE

04.07.23

VN

PW

06.06.23

VN

PW

renaissance

Renaissance Associates Ltd
Carver's Warehouse
77 Dale Street
Manchester
M1 2HG

STAR RADCLIFFE ACADEMY

04.07.23

VN

PW

06.06.23

VN

PW

FOR INFORMATION

Scale: 1:500

Project No: 2303-02

Project

Originator

Volume

Level

Type

Role

Category/Number

Rev.

FS1013-REN-XX-XX-D-CS-5100-P02



Note

- Do not scale from this drawing
- To be read in conjunction with Project Risk Register REF: FS1013-ALA-EX-XX-RR-L-00001
- To be read in conjunction with all other Landscape Architect's drawings
- To be read in conjunction with Outline Landscape Specification REF: FS1013-ALA-EX-XX-SP-L-0001

1	Obeying in dry retention basin	2.4m fencing. End user access restricted. Basin to be 800mm deep. Basin to dry out during a maintenance event. Retain sign.	31.07.23
2	Falling on stairs while accessing sport pitches	Stairways to be in situ. Hand rails provided at intervals.	31.07.23
3	Collision between pedestrians and vehicles accessing amenity parking area	Refer to signage vehicle speed. Refer to signage vehicle speed. Refer to signage vehicle speed.	31.07.23
4	Collision between pedestrians and vehicles in car park	Landscaping features to stop vehicles from leaving the road and parking area. Road markings to clearly define parking.	31.07.23
5	Collision between pedestrians and cyclists accessing cycle storage facilities	See note (pedestrian) / cycle approach. School to be signed speed on site. Clear signage.	31.07.23
6	Collision with contact with underground utilities and services	Tree pits to be located in close proximity to existing underground utilities and services. Ground levels to be set to a gradient of 1:10. 1.5m grid and call lines during construction.	31.07.23
7	Falling from height - 1.5m grassed bank to east of sports hall	Obstructed. Clear access to window openings.	31.07.23
8	Collision between pedestrians and open windows	Obstructed. Clear access to window openings.	31.07.23

ID	RISK	MITIGATION	DATE MITIGATED
RESIDUAL PROJECT RISKS			

KEY

Site

- Planning Application Boundary
- Extent of Works
- Proposed Building
- Existing Building to be demolished
- Existing Tree Retained
- Root Protection Area (RPA)
- Existing Tree to be removed
- Proposed Contours

Planting

Details refer to Planting Plan

- Proposed Tree
- Proposed Multi-stem Tree
- Grass Seed
- Amenity Planting
- Meadow Planting
- Swale Meadow Planting
- Woodland Planting
- Artificial Turf
- Hedge

Hard Surfaces

- P1 Pedestrian Macadam To Engineer's Specification
- P2 Vehicular Macadam To Engineer's Specification
- P3 Permeable Concrete Block Paving Refer to School Specific Outline Specification for Details
- P4 Coloured Pedestrian Macadam To Engineer's Specification
- P5 MUGA Permeable Surface To Engineer's Specification
- P6 Concrete Block Paving Refer to School Specific Outline Specification for Details
- P7 Concrete Surfacing To Engineer's Specification
- P8 Corduroy Tactile Paving Refer to School Specific Outline Specification for Details
- P9 Sensory Trail Refer to School Specific Outline Specification for Details

Furniture

- S1 Steps and Handrails Refer to School Specific Outline Specification for Details
- S2 Cycle Stands Refer to School Specific Outline Specification for Details

Fencing and Structures

- S3 Cycle Shelter Refer to School Specific Outline Specification for Details
- S4 Door Protection Barrier Refer to School Specific Outline Specification for Details
- S5 Seating Bench Refer to School Specific Outline Specification for Details
- S6 Picnic Table Refer to School Specific Outline Specification for Details
- S7 Litter Bin Refer to School Specific Outline Specification for Details
- S8 Bollards Refer to School Specific Outline Specification for Details
- S9 Ecological Enhancement Features Refer to School Specific Outline Specification for Details
- S10 Bespoke Star Seating Refer to School Specific Outline Specification for Details
- S11 Seating to habitat area Refer to School Specific Outline Specification for Details
- S12 PV Canopy Refer to School Specific Outline Specification for Details

DIE DESIGN DELIVERABLE REF : 150

11/09/2022	P02	Issued for ITT	PH	BS
31/07/2023	P01	Updated with latest building and access road. Landscape design progressed.	PH	BS
DATE	REV	DESCRIPTION OF REVISION	DRAWN BY	APPROVED BY
REVISIONS				

STATUS : **S4 - ITT**

ares

LANDSCAPE ARCHITECTS

Client : **Morgan Sindall**

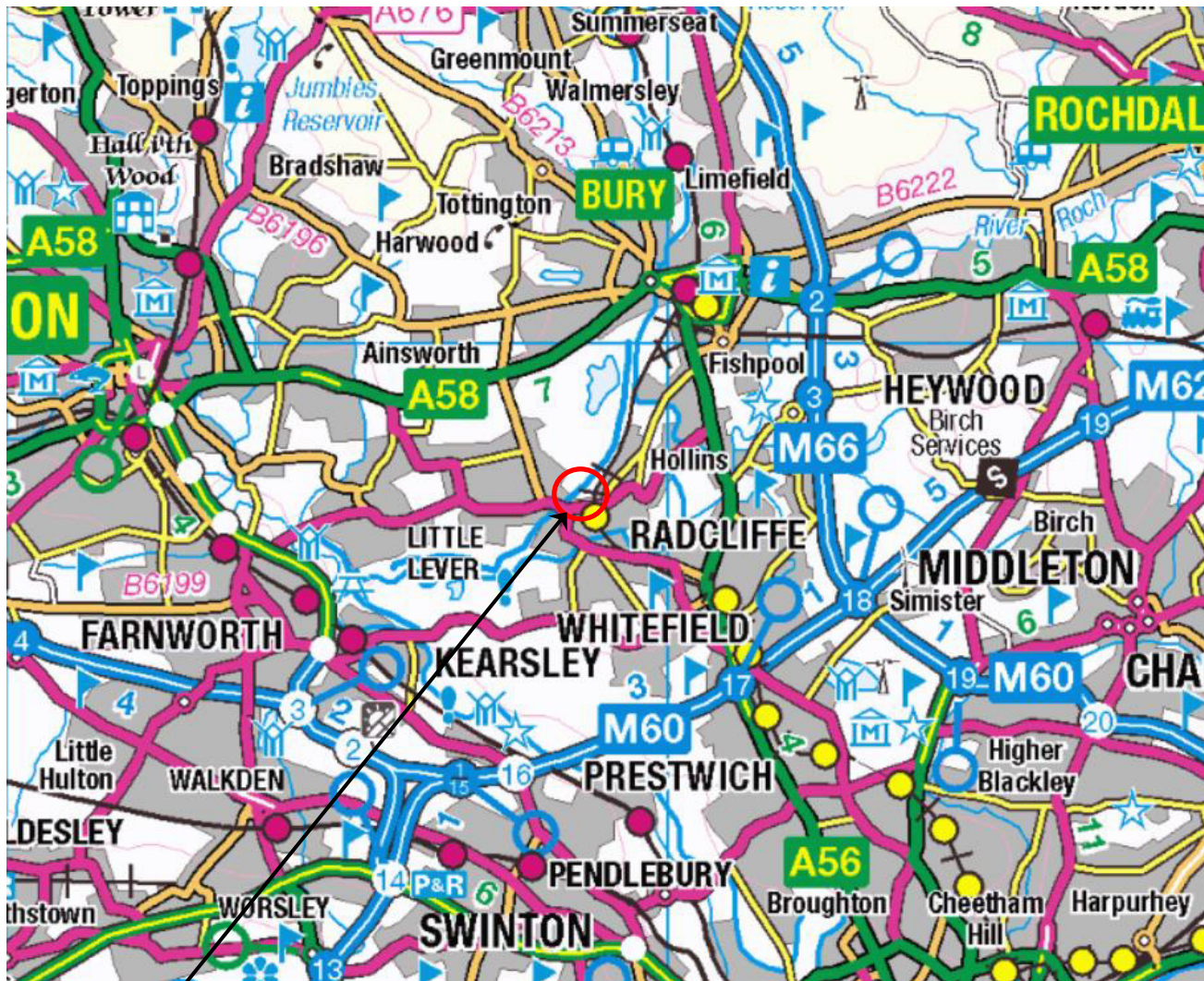
PROJECT TITLE : **Star Radcliffe Academy, Bury**

DRAWING TITLE : **Whole Site Plan**

DRAWING SCALE : 1:500	DRAWN BY : PH	DRAWN DATE : 06/07/2023
PAPER SIZE : A1	APPROVED BY : BS	ALA PROJECT CODE : ALA805

DRAWING NUMBER : FS1013-ALA-EX-ZZ-D-L-0001	STATUS : S4	REVISION : P02
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Area Landscape Architects LTD
Galsworthy,
51 Eyre Lane
Sheffield
S1 4RB
t: 0114 276 2000
e: hello@aresdesign.co.uk
w: ares.eu.com



SITE LOCATION

NEAREST POSTCODE: M26 2SZ

SITE ENTRANCE WHAT3WORDS:
///CHAIR.VERGE.SINGLE



REV	DATE	DESCRIPTION	BY	CKD
 BROWNFIELD SOLUTIONS LTD CEO ENVIRONMENTAL ENGINEERING EXCELLENCE				
CLIENT				
MORGAN SINDALL				
PROJECT TITLE				
STAR ACADEMY, RADCLIFFE, MANCHESTER				
DRAWING TITLE				
SITE LOCATION PLAN				
DRAWING No. C5394/01	REVISION -	SCALE NTS	DATE 16/06/23	
DRAWN BY SD		CHECKED BY PH		



KEY	
—	APPROXIMATE SITE BOUNDARY
■ TPXX	TRIAL PIT
● WSXX	WINDOW SAMPLE BOREHOLE
● ROXX	ROTARY OPEN BOREHOLE
○	BOREHOLE INSTALLATION
■ TPXXX	ADDITIONAL TRIAL PIT

GEOTECHNICS (2022)	
■ HPXX	HAND EXCAVATED TRIAL PIT
■ TPXX	TRIAL PIT
● DSXX	WINDOW SAMPLE BOREHOLE
● BHX	CABLE PERCUSSIVE/ROTARY CORE BOREHOLE
▲ DCPXX	PLATE LOAD TEST.LWD.TRL-DCP
○	SOAKAWAY INFILTRATION TEST
○	BOREHOLE INSTALLATION

- NOTES
1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
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REV	DATE	DESCRIPTION	BY	CKD



**BROWNFIELD
SOLUTIONS LTD**

CLIENT

MORGAN SINDALL

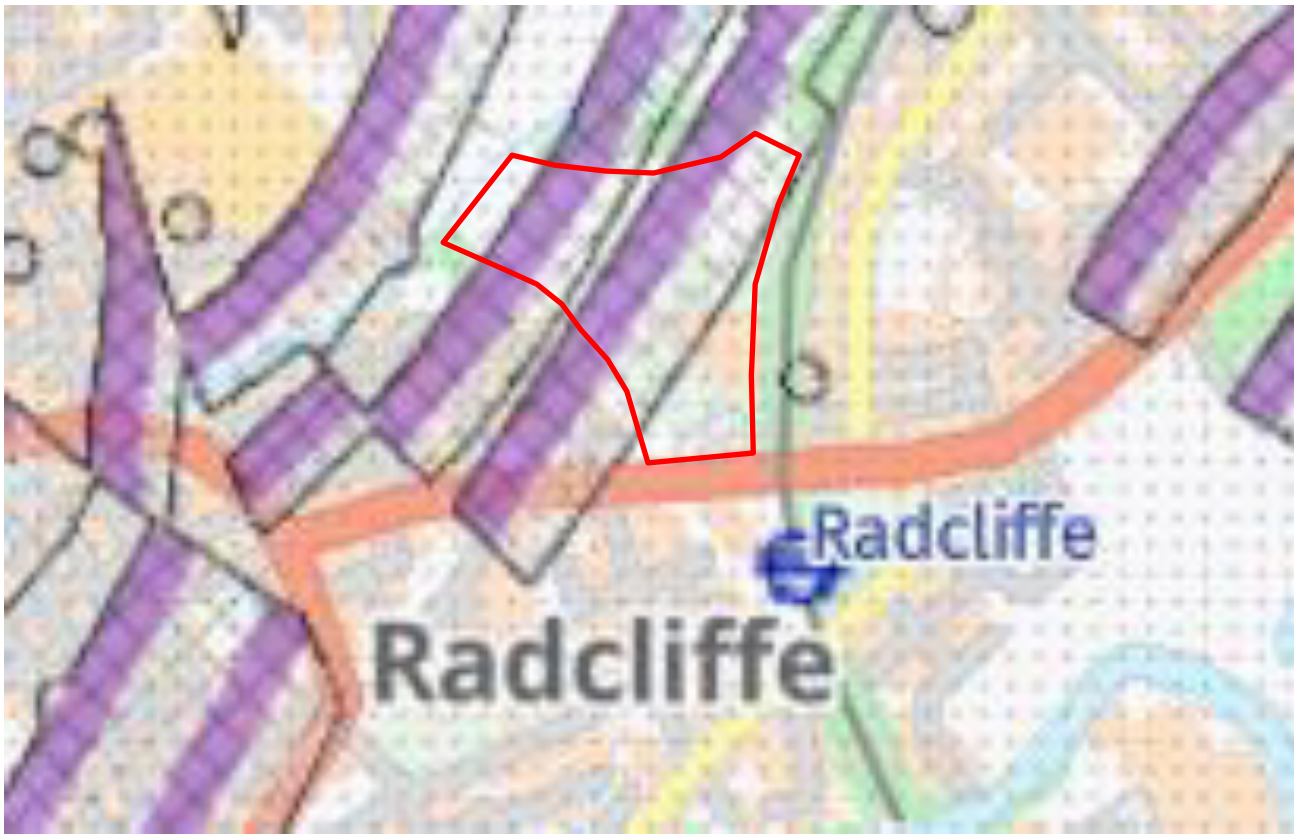
PROJECT TITLE

STAR ACADEMY, RADCLIFFE

DRAWING TITLE

EXPLORATORY HOLE LOCATION
PLAN

DRAWING No. C5394/02A	REVISION	SCALE NTS	DATE 21/08/23
DRAWN BY MB	CHECKED BY PH		



KEY

- APPROXIMATE SITE BOUNDARY
- ✕ MINE SHAFT
- ▣ DEVELOPMENT HIGH RISK AREA
- PROBABLE SHALLOW COAL MINE WORKINGS
- ABANDONED MINES CATALOGUE
- SURFACE COAL RESOURCE AREA
- COAL OUTCROPS

REV	DATE	DESCRIPTION	BY	CKD



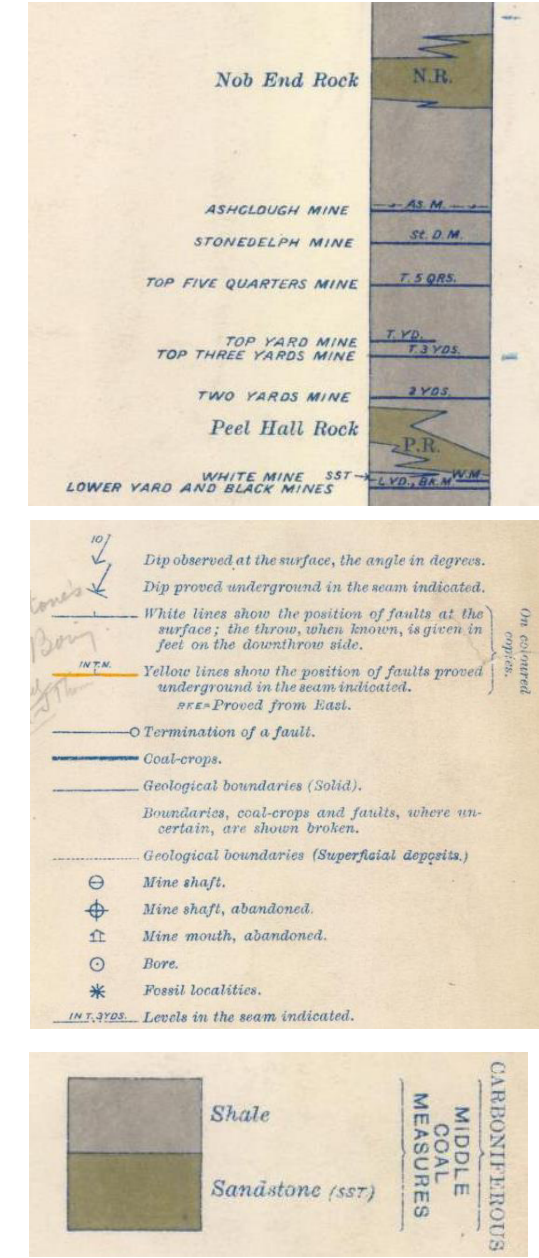
CLIENT			
MORGAN SINDALL			
PROJECT TITLE			
STAR ACADEMY, RADCLIFFE			
DRAWING TITLE			
COAL AUTHORITY INTERACTIVE MAP EXTRACT			
DRAWING No.	REVISION	SCALE	DATE
C5394/03	-	NTS	31/07/23
DRAWN BY		CHECKED BY	
PH		JM	



BGS COUNTY SERIES 1:10,000 LANCASTER SHEET 95 NE SOLID

KEY

APPROXIMATE SITE BOUNDARY



REV	DATE	DESCRIPTION	BY	CKD

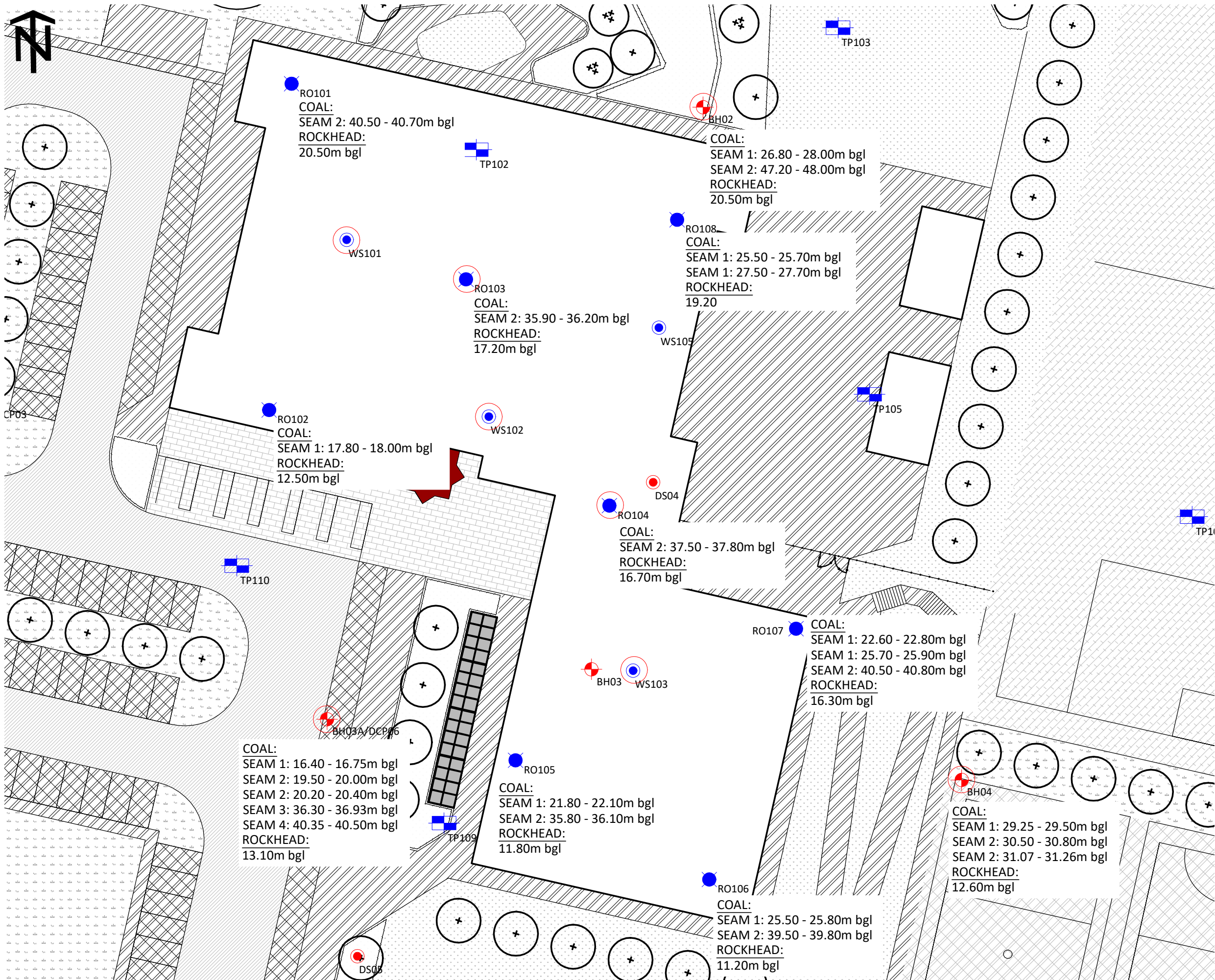


CLIENT
MORGAN SINDALL

PROJECT TITLE
STAR ACADEMY, RADCLIFFE

DRAWING TITLE
Geological Map Extract

DRAWING No.	REVISION	SCALE	DATE
C5394/04	-	NTS	31/07/23
DRAWN BY PH		CHECKED BY JM	



KEY	
	APPROXIMATE SITE BOUNDARY
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	ROTARY OPEN BOREHOLE
	BOREHOLE INSTALLATION
	ADDITIONAL TRIAL PIT

GEOTECHNICS (2022)	
	HAND EXCAVATED TRIAL PIT
	TRIAL PIT
	WINDOW SAMPLE BOREHOLE
	CABLE PERCUSSIVE/ROTARY CORE BOREHOLE
	PLATE LOAD TEST.LWD.TRL-DCP
	SOAKAWAY INFILTRATION TEST
	BOREHOLE INSTALLATION

NOTES

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REV	DATE	DESCRIPTION	BY	CKD



CLIENT
MORGAN SINDALL

PROJECT TITLE
STAR ACADEMY, RADCLIFFE

DRAWING TITLE
**PROPOSED DEVELOPMENT
FOOTPRINT BEDROCK PROFILE**

DRAWING No.	REVISION	SCALE	DATE
C5394/05		NTS	12/10/23
DRAWN BY PH		CHECKED BY TM	



KEY

- APPROXIMATE SITE BOUNDARY
- SLOPE AREA
- WOODLAND
- IP GAS MAIN
- COAL SUBCROP
- SITE ENTRANCE
- DERELICT PLAYING FIELD
- GATE

NOTES

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REV	DATE	DESCRIPTION	BY	CKD



CLIENT
MORGAN SINDALL

PROJECT TITLE
STAR ACADEMY, RADCLIFFE

DRAWING TITLE
SITE FEATURES PLAN

DRAWING No.	REVISION	SCALE	DATE
C5394/06	-	NTS	12/10/23
DRAWN BY OS		CHECKED BY PH	

APPENDIX A

BSL Methodology and Guidance

BSL Phase I & II Geo-Environmental Assessment Reports - Methodology and Guidance

This Appendix provides information on the approaches, methods and guidance used by Brownfield Solutions Ltd in the preparation of this report.

The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential soils and groundwater contamination). The term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). It should be noted that this is an integrated investigation and these two main aspects are related, unless otherwise specified within the report.

Phase I reports are written in general accordance with the description of a Preliminary Investigation as defined in BS10175:2011+A2:2017 and are also produced in general accordance with the recommendations for a Tier 1 Preliminary Risk Assessment as described in LCRM guidance

The first stage of the investigation and assessment of a site is the Preliminary Investigation/Tier 1 Preliminary Risk Assessment, often referred to as a Phase 1 Desk Study, comprising a desk study and walk-over survey and collation of desk-based searches, which culminates in the Preliminary Risk Assessment and the development of a preliminary/initial Conceptual Site Model (CSM). From this are identified any potential geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them.

From the geo-environmental perspective, the hazard Identification process uses professional judgement to evaluate all the hazards in terms of possible contaminant linkages (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment as part of Phase II investigations and reports.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include an exploratory, a detailed or/and supplementary Investigations as described in BS 10175:2011+A2:2017. Phase II Assessments are produced in general accordance with the recommendations for a Tier 2 Generic Quantitative Risk Assessment as described in LCRM guidance and are also intended to fulfil the requirements of a Ground Investigation Report (GIR) as detailed in BS EN 1997-2:2007.

Contaminated Land - Legislative Background

Land contamination can be addressed in several ways, e.g. during planning, under Part 2A, following an incident, during an investigation into environmental damages, or during the application of an environmental permit, or its surrender.

For the planning process the key test is **as a minimum the site cannot be determined as contaminated land**, e.g. there is not significant harm, significant possibility of significant harm to human health or that there is not significant harm to, or the significant possibility that the pollution of controlled waters will occur.

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act.
- The Contaminated Land Statutory Guidance, DEFRA – April 2012.
- The Contaminated Land (England) Regulations 2006.
- The Contaminated Land (England) Amendment Regulations 2012.
- Water Resources Act.
- Water Framework Directive.
- Environmental Damage Regulations.
- Environment Agency (EA) - Land Contamination Risk Management (LCRM) 2019.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

- 1) Significant harm is being caused or there is a significant possibility of such harm being caused.
- 2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

Source - substances that are potential contaminants or pollutants that may cause harm.

Pathway - a potential route by which contaminants can move from the source to the receptor, and the impact of that migration on the source e.g. ;attenuation.

Receptor - a receptor that may be harmed, for example the water environment, humans and water, considering the sensitivity of the receptor

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the S-P-R approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents

This report has been prepared in accordance with the list of guidance below, however the list is not exhaustive:

- DETR: Circular 02/2000: Environmental Protection Act 1990: Part IIA: Contaminated land. 2012.
 - Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002.
 - BS 10175:2011+A2:2017.
 - Environment Agency (EA) - Land Contamination Risk Management (LCRM). 2019.
-

- Groundwater Protection - <https://www.gov.uk/government/collections/groundwater-protection>.
- UK Technical Advisory Group (UKTAG) - - Water Framework Directive
- Incidents and their classification: the Common Incident Classification Scheme (CICS) – Used by the Environment Agency to classify pollution incidents.

Relevant Legislative Documents

The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012).
- The Environment Protection Act (1990).
- The Water Resources Act (1991).
- The Environment Act (1995).
- The Contaminated Land (England) Act (2000).
- The Pollution Prevention and Control (England and Wales) Regulations (2000).
- The Landfill Regulations (England and Wales) Regulations (2002).
- The Landfill (England and Wales) (Amendment) Regulations (2004).
- Contaminated Land (England) Regulations (2012).
- The Environmental Damage (Prevention and Remediation) Regulations (2009).
- Environmental Permitting Regulations (England and Wales) Regulations (2010).
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- Health and Safety at Work Act.
- National Planning Policy Framework (NPPF)(2021).

Contaminated Land Risk Assessment Approach

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification ➡ Hazard Assessment ➡ Risk Estimation ➡ Risk Evaluation.

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under LCRM, three tiers of risk assessment exist – Stage/Tier Preliminary Risk Assessment, Stage 2 Generic Quantitative and Stage 3 Detailed Quantitative.

Further information can be found at the below site:

<https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme

(CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report if applied.

The likelihood of a given receptor being impacted is related to a number of factors, e.g. the geology which could inhibit contaminant migration. For example, a site with a significant thickness of clay between it and a receptor may reduce migration of contamination via the subsurface, which will reduce the likelihood of a given receptor being impacted. The geology or drainage for example could offer a preferential pathway e.g. mines shafts/faults increasing the likelihood and potential magnitude of an impact. The depth of contamination will also affect the exposure pathway, for example petroleum hydrocarbons at depth are unlikely to reach a receptor via dermal contact but could via vapour pathways which will influence the likelihood of an impact being felt e.g. if there are no buildings on site.

The terms and definitions used for the assessment of the likelihood are provided below:

High likelihood: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.

Examples - Extensive areas with concentrations above saturation limits for mobile contamination e.g. petroleum hydrocarbons within the water table.

Likely: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term.

Examples – Localised areas of contaminants with concentrations above saturation limits for mobile contamination e.g. localised petroleum hydrocarbons within the water table; shallow contamination above relevant human health generic assessment criteria is present with little or no hardstanding,

Low likelihood: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term.

Examples - A thickness/distance of low permeability deposits preventing contaminant migration to a receptor is present; a site is mostly covered hard standing preventing exposure to soil contamination.

Unlikely: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

Examples – A site is underlain by a substantial thickness of low permeability clays, between the source and potential receptors which will inhibit significantly, but not completely rule out migration to sensitive receptors.

The severity is also classified using a system based on CIRIA C552, with reference to Incidents and their classification: the Common Incident Classification Scheme (CICS), Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance 2012 and other guidance as appropriate which will be detailed within the main body of the report, if applied. The terms and definitions are:

Severe: Short term (acute) risk to human health likely to result in ‘significant harm’ as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000);

Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse.

Medium: Chronic damage to human health (‘significant harm’ as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in ‘Draft Circular on Contaminated Land’, DETR 2000);

Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve.

Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment.

Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

Minor: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low
	No Linkage	Negligible			

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

Very high: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required.

High: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term.

Moderate: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term.

Low: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.

Very Low: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Some linkages may be identified which constitutes a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled 'no linkage' in the summary table, which give rise to a **negligible** risk category and no further action is required.

Ground Gas Risk Assessment Guidance

BS8485:2015+A1:2019, BS 8576:2013, CIRIA C665 and CL:AIRE RB17 are the current guidance which gives up-to-date advice on all aspects of ground gas. They outline good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to ground gas contamination.

Within BS8485:2015+A1:2019, BS 8576:2013 and CIRIA C665, two semi-quantitative methods are set out for the assessment of risk:

- 1 For low rise housing with a ventilated under floor void at minimum 150 mm (Boyle and Witherington).
- 2 For all other development types (Wilson and Card).

Both methods use the concept of Gas Screening Values (GSVs) to identify levels of risk. The mitigation and management of potentially unacceptable risk is described with reference to both passive and active systems of gas. Source removal is also discussed as an option. A separate approach is discussed under the RB17 header further below.

The aim of the guidance is for a consistent approach to decision making, particularly relating to the scope of protective design measures on a site-specific basis.

Legislative Framework

BS8485:2015+A1:2019, BS 8576:2013 and CIRIA C665 provides technical guidance, however they also recognise the context into which the guidance has to be employed. Government policy is based upon a “suitable for use approach”, which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the “source” in a “pollutant linkage” which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be “contaminated land” under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land*.

Generation Potential of Sources

BS 8576:2013 Figure 6 provides a basis for assessing the generation potential from sources identified as part of the Phase I Assessment. These are summarised below:

Generation Potential	Typical Sources
Very Low	- Natural carbonate soil and strata, e.g. chalk and limestone. - Natural soil strata with a low degradable organic content, e.g. alluvium, peat. - In-filled pond less than 15 m diameter, in-filled before 1930s to 1940s. - Made ground with low degradable organic content (e.g. up to 5% organic material such as pieces of wood, pieces of paper, rags, etc. with a high proportion of ash and no food or other easily degradable waste). - Mine workings shallow or shaft (where there is clear evidence that they are flooded). - Inert landfill sites.
Low	- Natural soil strata with a high degradable organic content (DOC). - Made ground with total organic carbon (TOC) up to 6% (e.g. dock silt, no food or other easily degradable waste). - Foundry sand (includes phenolic binders, rags and wood that decay, albeit at low rates). - Landfill 1945 to mid 1960s (see also Moderate below).
Moderate	- Sewage sludge. - Mine workings – unflooded, more than 50 years since last worked (gas is liberated from coal when mine workings are excavated; this continues for up to about 50 years). - Landfill 1945 to mid 1960s (this could also be “low” or, if disturbed, “high”).

Generation Potential	Typical Sources
High	- Landfill mid 1960s to early 1990s. - Mine workings – unflooded – less than 50 years since last worked.
Very High	- Municipal landfill sites. - Landfill early 1990s onward.

Frequency and Duration of Monitoring

The monitoring period for a specific site covers the “worst case” scenario. A “worst case” scenario will typically occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of the additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with soil gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection. CL:AIRE publication TB17 “Ground Gas Monitoring and ‘Worst-Case’ Conditions” provides further guidance.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (Apartments)	2 months	3 months	6 months	12 months	24 months
	High (Low rise Residential)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring/Number of Visits Required

		Gas Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4	6	6	12	12
	Moderate (Apartments)	6	6	9	12	24
	High (Low rise Residential)	6	9	12	24	24

Note

- NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).
- Generation potential of sources based on descriptions within BS 8576:2013.
- At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

It is recommended that newly installed monitoring wells are left for 24 hours to allow the soil gas to reach equilibrium. It should be recognised, however, that some soil gas regimes could take considerably longer (up to seven days). Interpretation of any initial readings should take this equilibrium process into account.

RB17 Approach

CL:AIRE RB17 (Card et al 2012) is a pragmatic approach to ground gas risk assessment and was developed because gas concentration, pressure and flow rate measured in a well headspace may not be representative of the conditions in the surrounding formation.

In these low-risk situations, the approach is to use the conceptual site model and the estimation of the likely gas generation from a source to identify where or if gas monitoring is required to better define the risks.

Under this approach, for sites with natural soils only with no credible methane source, then no action is required (no monitoring or gas protection measures) as this represents Characteristic Situation 1 (CS1).

Unexploded Ordnance (UXO) Guidance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA report C681.

BSL carry out non-specialist UXO screening exercises by considering any evidence of UK defence activities on or near the site evident from gathered desk study information and the unexploded aerial delivered bomb (UXB) online risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available online Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experienced and considered competent in the assessment of UXO.

Contaminated Land Screening Values

In assessing the potential for contamination Brownfield Solutions Limited (BSL) follows UK guidance and current best practice.

General

The current recommended method for assessing contamination is on the basis of:

Source-Pathway-Receptor

Where any one of these “pollution linkages” is absent there is deemed to be no risk.

Fundamentally, receptors can be considered as humans (human health) and controlled waters (surface and ground waters).

The purpose of using generic Tier 1 screening levels is to have a simple means of assessing the potential contamination of a site and to inform decisions on whether further investigation is warranted or whether an option to undertake clean up based on the data to hand is cost effective.

Human Health

Current UK guidance is provided by DEFRA and the Environment Agency (EA). Publications forming part of the guidance include the CLEA Model and toxicological reports collectively referred to as the CLEA Guidance. The CLEA Guidance has included a number of publications which have provided initial screening values for soil contamination based on standard land uses and soil assumptions.

CLEA guidance has gone through a number of revisions over time. Tier 1 generic S4UL values have been published using the CLEA 1.06 Model by CIEH/LQM. These are the third set of generic assessment criteria generated by CIEH and replace the previous two sets of GACs (Generic Assessment Criteria). The revised S4UL values are based on greater knowledge of relevant toxicology and further consideration of exposure frequencies.

C4SL values for six determinands including lead was published by DEFRA/CL:AIRE in December 2014 and they represent a low risk as opposed to minimal risk. These screening values were published by DEFRA for Part 2A use, although with the dual purpose for use under planning. However, S4ULs remain the first reference due to the broader range of end uses and soil organic content.

The preference from the EA is that site specific screening levels are used wherever possible. Due to numerous factors it is not always possible to utilise site specific values. In these instances the following data sources are used in the order of preference given below:

- CIEH S4UL values (derived by CIEH/LQM).
- DEFRA/CL:AIRE C4SL's.
- CL:AIRE GAC values.
- Guidance from other European countries.
- Guidance from the outside Europe.

Controlled Waters

The European Water Framework Directive (WFD) became UK law in December 2003. It was created to ensure that European countries manage their rivers, groundwater and lakes so that they stay healthy for people and for wildlife.

This is achieved by the use of chemical standards for surface waters and groundwater. These values describe concentrations of chemicals that are not expected to cause harm to environmental organisms or human health, provided they are not exceeded. The same chemical may have several standards for different environmental regimes, and for different protection objectives.

Statutory Standards are set in legislation and if exceeded, this constitutes non-compliance with statutory obligations. European Directives are implemented in England and Wales by corresponding statutory instruments (i.e. regulations). The statutory instruments can be the exact same standards as they appear in the Directive or be more stringent.

A number of non-statutory standards also exist, these are set by various organisations (including the EA) for chemicals that are considered to be of concern, but are not covered by any specific legislation.

The chemical standards used in the UK to control impact of contamination on controlled waters are Environmental Quality Standards (EQS). The EQS's cover a large number of compounds.

Where certain compounds are not covered by the EQS these are commonly compared to the UK Drinking Water Standards (DWS).

Further Assessment

When screening values are exceeded then further consideration is required. This could include the use of simple measures to break the pollution pathway and mitigate the risk, further additional detailed investigation, including the deriving of site-specific values to better define the risk, and to design appropriate remedial measures.

Re-Use Of Waste - Guidance Note

Definition of Waste

The Environment Agency considers waste to be “...any material that is discarded, or intended to be discarded...” This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

CL:AIRE: Code of Practice

Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE “Development Industry Code of Practice for the Definition of Waste” (CL:AIRE DoWCoP), also commonly referred to as a “Materials Management Plan”.

The developer/contractor is advised to complete all works under the DoWCoP.

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site.

The Code of Practice requires 4 No. Factors to be addressed:

- 1) Protection of human health and protection of the environment.
- 2) Suitability of use, without further treatment.
- 3) Certainty of use.
- 4) Quantity of material.

In order to satisfy these requirements the following are required:

- i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
- ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
- iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
- iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
- v) Volume calculations.
- vi) Planning permission for the development.
- vii) Contractual details to be clear, regarding who steps in if a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.

Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use. Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Waste Classification for Soils

Introduction

Waste producers have a duty of care to classify the waste they are producing:

- Before it is collected, disposed of or recovered.
- To identify the controls that apply to the movement of the waste.
- To complete waste documents and records.
- To identify suitably authorised waste management options.
- To prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points:

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept hazardous, non-hazardous or inert wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e the hazard assessment. The most common EWC waste codes related to soil are:

17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific “hazardous properties” which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

Waste Definitions

Inert	- Will not undergo any significant physical, chemical or biological transformations. - Will not dissolve. - Will not burn. - Will not physically or chemically react. - Will not biodegrade. - Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. - Has insignificant total leachability and pollutant content. - Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) the WAC is not relevant. Furthermore, the WAC limits **cannot** be used to make an assessment of whether a waste is hazardous. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations ¹	Non-Hazardous Waste		Hazardous Waste	
	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	Above hazardous WAC limit values
WAC testing				
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill ²	HAZARDOUS landfill	PRE-TREATMENT ³

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).

2 Individual sites may have certain limit values pre-determined in their licence.

3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However, hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils, it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

For contaminated land specific consideration must be given to the following before proceeding;

- The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
- The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of marker compounds is optional; however, it is recommended that where possible the marker compounds should be used. WM3 states:

If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:

- The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
- This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
- The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

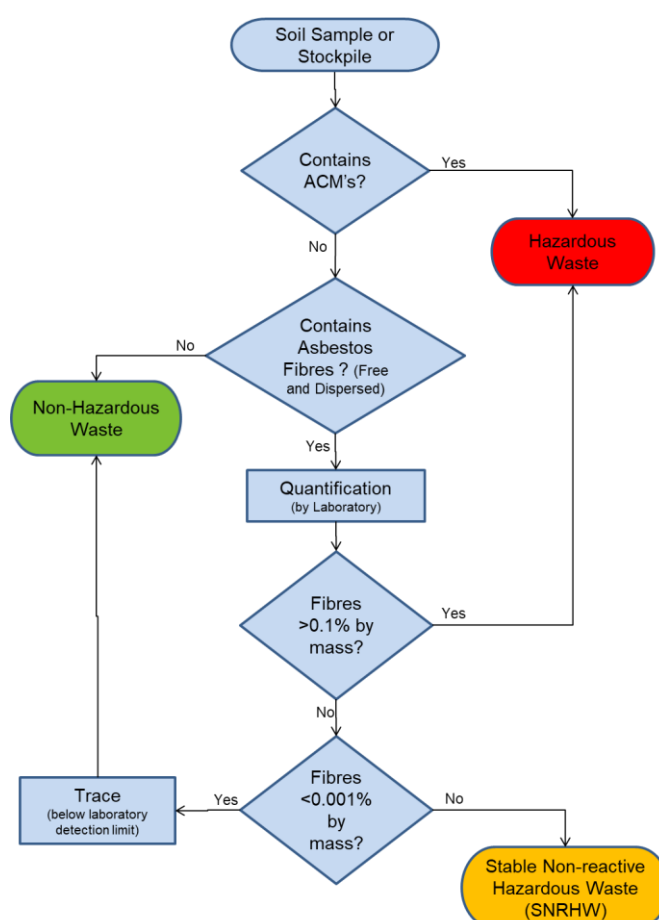
Additional Asbestos Guidance Notes

Disposal

The 1st Edition of WM3 "Guidance on the classification and assessment of waste", details the way in which Asbestos is assessed within soils.

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's)



Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site¹. These levels are often termed "trace" by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)¹. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	Insulation materials and asbestos-containing construction materials
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and "*other suitable materials*" may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However, where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether or not the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However, it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four-hour period. The control limit is not a 'safe' level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 "the release of dispersed asbestos fibres from soil" 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m³.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (e.g. by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use

The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation. There is currently a Joint Industry Working Group (JIWG) tasked with producing a Code of Practice for Asbestos in Soil, Made Ground and Construction & Demolition Material that will clarify in due course the position of the various government agencies.

Asbestos containing materials can remain in situ under a suitable cover system which may be hardsurfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Preliminary publications from JIWG (April 2015) provide guides for decision making in relation to construction.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk. There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However, the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required.

The re-use of soils containing asbestos at concentrations above hazardous waste levels is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

Asbestos in Soil as Free Fibres

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recyc	Inert	SNR	Hazardo		Suitable for re-use on site	Precautions
Not detected	√	√			No precautions necessary, however on a brownfield site asbestos not previously identified may be found during works and a statement within the contractors method statement for how they will deal with this unforeseen asbestos would be good practice to ensure compliance with CAR2012.	Yes	None
Trace (<0.001%)		√ ²			Precautions are unlikely to be required, however a detailed method statement may be required to ensure compliance with CAR2012. Basic asbestos management good practice will be required. Typically precautions would include: - Ensuring soils do not dry out to become dusty. - Site personnel have the risk communicated at induction stage.	Yes Soils can be re-used under CL:AIRE CoP with the correct precautions in place.	Generally clean cover or hardstanding cover required.
0.001% – 0.099%			√		Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: - Site personnel have the risk communicated at induction stage. - Ensuring personnel have suitable training. - Task monitoring to inform PPE requirements. - Ensuring soils do not dry out to become dusty and that misting is available during groundworks. - Separate stockpiling. - Clean haulage routes.	Possibly Soils may be able to be re-used under CL:AIRE CoP, subject to a satisfactory Risk Assessment and regulatory agreement with the correct precautions in place.	Clean cover or hardstanding cover required.
0.1+%				√	Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: - Site personnel have the risk communicated at induction stage. - Ensuring personnel have suitable training. - Task monitoring to inform PPE requirements. - Site wide and or perimeter monitoring. - Ensuring soils do not dry out to become dusty and that misting is available during groundworks. - Separate stockpiling. - Clean haulage routes. - Decontamination unit	Unlikely ³ Re-use of soils containing asbestos within an earthworks scheme will involve significant engineering and the Risk for generating dusts will be significantly increased with	Clean cover and a hard dig layer. A plan should be in place for future excavations as part of the Health and Safety File.

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recyc	Inert	SNR	Hazardo		Suitable for re-use on site	Precautions
						repeated handling and compaction.	

1. The standard laboratory detection limit is normally 0.001%. Below 0.001% is trace and currently regarded as not containing asbestos for the purposes of disposal off site. However the waste producer has a duty to fully classify the waste and the presence of trace asbestos should be declared. Consequently it is unlikely that a waste treatment site will take this soil and an inert landfill may make a commercial decision to only take it under some circumstances.
2. The re-use of soils containing asbestos at concentrations above hazardous waste is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be warranted where there a long program for implementation.

APPENDIX B

Exploratory Hole Logs



No.

TP101S

Sheet 1 of 1

PROJECT NO: C5394

CO-ORDS: 378609E, 407703N

PROJECT NAME: STAR ACADEMY, RADCLIFFE

LEVEL: 75.71m OD

CLIENT: MORGAN SINDALL

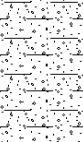
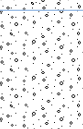
DATES: 09/08/23

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Checked

PH

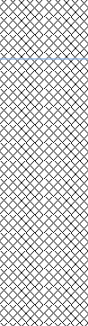
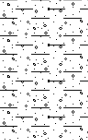
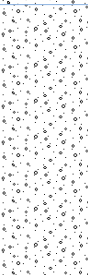
NS

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.00-0.20	ES		0.20	75.51		MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.	1.0
	0.50	B D		0.70	75.01		Orangish brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of quartz, sandstone, flint, mudstone and coal.	
							Firm orangish brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of coal, sandstone, mudstone and quartz.	
	1.20	B D		1.10	74.61		Brown sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone, mudstone, flint and quartz.	
				1.50	74.21		End of Trial Pit at 1.50m	
								3.0
								4.0
								5.0

Remarks

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. Moderate groundwater seepage encountered at 1.10m bgl.
3. Hand shear vanes unable to be taken in clay due to friable nature.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378688E, 407714N		TP102
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 74.58m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 09/08/23		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						PH	NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.10	ES		0.20	74.38		MADE GROUND TOPSOIL: Grass over dark brownish black slightly clayey gravelly sand. Sand is fine to coarse. Gravel is sub-rounded to sub-angular fine to coarse of brick, coal, mudstone, sandstone, glass and metal.	1.0
	0.40	ES					MADE GROUND: Dark brownish black slightly clayey gravelly sand. Sand is fine to coarse. Gravel is sub-rounded to sub-angular fine to coarse of brick, coal, mudstone, sandstone, glass and metal.	
	0.50	B						
	1.20	HSV	51kPa	1.10	73.48		Firm grey mottled orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone.	2.0
	1.40	B D						
	1.70	B D					Grey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of flint, sandstone, mudstone and quartz.	
	2.40	D		2.50	72.08		End of Trial Pit at 2.50m	5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Large groundwater seepage encountered at 1.70m bgl 3. Terminated at 2.50m bgl due to side collapse on both sides of pit at 1.60m bgl due to large groundwater strike. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378725E, 407726N		TP103
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 74.23m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 09/08/23		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						PH	NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.00-0.20	ES	63kPa	0.20	74.03		TOPSOIL: Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone and mudstone.	1.0
	0.40	D					Firm grey mottled orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone.	
	0.50	HSV B						
								
								
	1.30	B D		1.20	73.03		Orangish brown gravelly SAND. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone, mudstone and quartz.	
								
	2.00	B D		1.90	72.33		Stiff grey gravelly CLAY. Gravel is sub-rounded fine to coarse of sandstone and mudstone. <i>Becoming slightly sandy from 1.90m bgl.</i>	2.0
								
	2.50	HSV	120kPa					
								
	3.00	D						3.0
								
								
				3.50	70.73		End of Trial Pit at 3.50m	4.0
								
								
								
								5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Large groundwater seepage encountered at 1.90m bgl. 3. Terminated due to side collapse on north side of pit at 3.50m bgl. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane



No.

TP104

Sheet 1 of 1

PROJECT NO: C5394

CO-ORDS: 378765E, 407734N

Hole Type

Hole Type

PROJECT NAME: STAR ACADEMY, RADCLIFFE

LEVEL: 71.68m OD

Scale

1:25

CLIENT: MORGAN SINDALL

DATES: 10/08/23

Logged

Checked

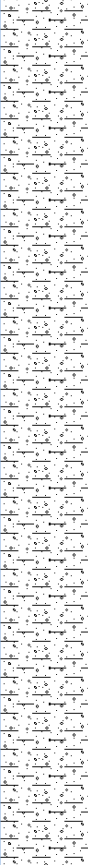
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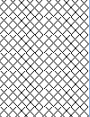
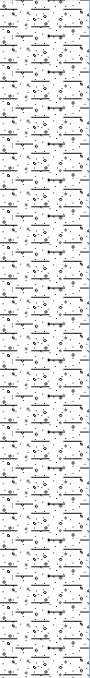
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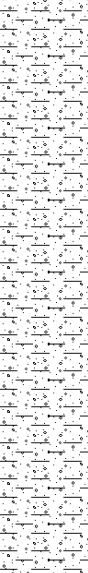
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.50-1.00	B ES		0.15	71.53		MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).
							Firm brown gravelly sandy CLAY with medium cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. Cobbles are sub-angular to sub-rounded of mudstone up to 200mm in diameter.
				2.10	69.58		End of Trial Pit at 2.10m

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. Small groundwater seepage encountered at 0.80m bgl
3. Terminated at 2.10m bgl due to large mudstone cobbles.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.	
PROJECT NO: C5394						CO-ORDS: 378728E, 407689N		TP105	
								Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.47m OD		Hole Type	
								TP	
CLIENT: MORGAN SINDALL						DATES: 10/08/23		Scale	
								1:25	
								Logged	Checked
								MB	NS
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.50-1.00	B ES		0.20	71.28		MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).		
				<i>Geotextile membrane at 0.10m bgl.</i>					
							Stiff brown slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of coal, mudstone and sandstone. Cobbles are sub-angular to sub-rounded of mudstone up to 200mm in diameter.		

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378761E, 407676N		TP106
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 71.24m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 09/08/23		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						PH	NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.20	D					MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).	
	0.40-1.25	ES		0.40	70.84		MADE GROUND: Black gravelly sand with moderate ash content. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of coal, slag, metal, brick, glass, mudstone and sandstone. <i>Slight hydrcoarbon odour from 0.40m to 1.25m bgl.</i>	1.0
	0.70	B						
				1.25	69.99		Stiff grey mottled orange and red slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is fine to coarse sub-rounded of sandstone and mudstone.	
	1.60	D						
	1.70	HSV	110kPa					2.0
	1.80	B						
	2.50	D HSV	120kPa					3.0
				3.50	67.74		End of Trial Pit at 3.50m	4.0
								5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Terminated at 3.50m bgl due to very stiff clay. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378788E, 407650N		TP107
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.81m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 10/08/23		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						MB	NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.20			0.20	70.61		MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base). <i>Geotextile membrane at 0.10m bgl.</i>	
	0.50-0.60	B ES					MADE GROUND: Black gravelly sand with moderate ash content. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of coal, slag, brick, mudstone and sandstone.	1.0
	1.30			1.30	69.51		Firm dark grey mottled blue slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone. <i>Slight hydrocarbon odour from 1.30m to 3.20m bgl.</i>	2.0
	1.50-1.60	B ES						3.0
	3.20			3.20	67.61		End of Trial Pit at 3.20m	4.0
								5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Small groundwater seepage encountered at 1.30m bgl. 3. Completed at 3.20m bgl. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane



No.

TP108

Sheet 1 of 1

CO-ORDS: 378724E, 407626N

LEVEL: 70.89m OD

DATES: 09/08/23

Logged

Checked

PH

NS

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
▼	0.10-1.00	ES	63kPa	0.05	70.84		MADE GROUND: Black tarmacadam.	1.0	
	1.00 1.00-2.00	B ES		0.10	70.79		MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).		
							MADE GROUND: Black gravelly sand with moderate ash content. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of coal, slag, metal, brick, glass, mudstone and sandstone. <i>Slight hydrocarbon odour from 0.10m to 2.00m bgl.</i>		
	2.10	B ES HSV		2.00	68.89		Firm grey mottled orange slightly sandy gravelly CLAY.		2.0
				2.20	68.69		Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone.		
							3.0		
							4.0		
							5.0		

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. Groundwater encountered at 1.50m bgl.
3. Terminated at 2.20m bgl due to large groundwater strike.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane



No.

TP109

Sheet 1 of 1

CO-ORDS: 378685E, 407645N

LEVEL: 73.60m OD

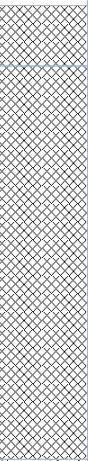
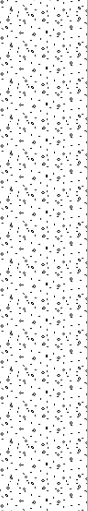
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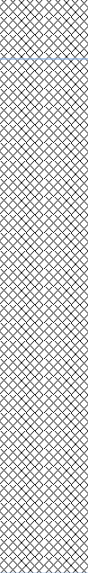
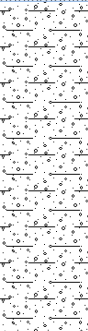
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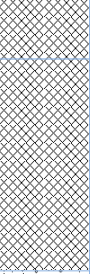
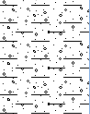
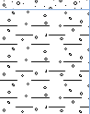
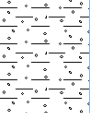
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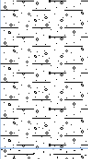
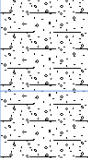
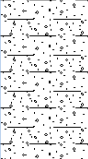
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.30-1.00	B ES		0.20	73.40		MADE GROUND TOPSOIL: Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. MADE GROUND: Dark brown slightly gravelly clayey sand. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick, coal, mudstone, sandstone, plastic and timber.	1.0
	1.60-2.00	B ES		1.50	72.10		Orangish brown slightly gravelly SAND with low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. Cobbles are subrounded of mudstone up to 200mm in diameter.	2.0
					3.20	70.40		End of Trial Pit at 3.20m
								4.0
								5.0

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. No groundwater encountered.
3. Terminated at 3.20m bgl due to instability of the trial pit walls.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
PROJECT NO: C5394						CO-ORDS: 378664E, 407671N		TP110
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 74.33m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 10/08/23		Hole Type
								TP
								Scale
								1:25
						Logged	Checked	
						MB	NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.50-1.00	B ES		0.20	74.13		MADE GROUND TOPSOIL : Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. MADE GROUND: Dark brown slightly gravelly clayey sand. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick, coal, mudstone, sandstone, plastic and timber. <i>Mild organic odour from 0.20m to 1.90m bgl.</i>	1.0
	2.00-2.50	B ES		1.90	72.43		Brown slightly clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. Cobbles are sub-angular to sub-rounded of mudstone. up to 250mm in diameter.	2.0
				3.00	71.33		End of Trial Pit at 3.00m	3.0
								4.0
								5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Small groundwater seepage encountered at 2.00m bgl. 3. Completed at 3.00m bgl. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No.
								TP111
								Sheet 1 of 1
PROJECT NO: C5394						CO-ORDS: 378622E, 407597N		Hole Type
								TP
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 74.11m OD		Scale
								1:25
CLIENT: MORGAN SINDALL						DATES: 09/08/23		Logged
								Checked
								PH
								NS
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
	Depth (m)	Type	Results					
	0.10	ES		0.20	73.92		MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.	
	0.40	ES					MADE GROUND: Dark brownish black slightly clayey gravelly sand. Sand is fine to coarse. Gravel is sub-rounded to sub-angular fine to coarse of brick, coal, mudstone, sandstone, glass and metal.	
	0.50	B						
				0.90	73.22		Firm orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, mudstone and coal.	1.0
	1.20	D		1.30	72.82		Grey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of flint, sandstone, mudstone and quartz.	
	1.40	B D						
				2.00	72.11		Firm bluish brown gravelly CLAY. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, mudstone and coal.	2.0
	2.20	HSV	69kPa					
	2.50	D						
	2.90	HSV	74kPa					3.0
				3.50	70.61		End of Trial Pit at 3.50m	
								4.0
								5.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Completed at 3.50m bgl. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD							Borehole Log			Window Sampler No.							
										WS101							
										Sheet 1 of 1							
PROJECT NO: C5394							CO-ORDS: 378675E, 407705N			Hole Type							
										WS							
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 74.67m OD			Scale							
										1:30							
CLIENT: MORGAN SINDALL							DATES: 08/08/23			Logged	Checked						
										NA	NS						
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description									
		Depth (m)	Type	Results													
		0.00-0.20	ES					MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.		1.0							
		0.20-0.60	ES		0.20	74.47		MADE GROUND: Brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is angular to sub-rounded fine to coarse of sandstone and mudstone.									
					0.60	74.07		MADE GROUND: Black slightly gravelly slightly sandy clay with rare organic matter content. Sand is fine to coarse. Gravel is sub-angular to rounded fine to coarse of brick, sandstone and mudstone.									
		0.80-1.00	ES					Mild organic odour from 0.60m to 1.20m bgl.		2.0							
		1.20	SPT	N=4 (0,0/1,1,1,1)	1.20	73.47		Soft grey mottled orange slightly gravelly slightly sandy CLAY with rare organic matter content. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone and mudstone.									
		1.30-1.40	D														
		1.90-2.00	D		1.80	72.87		Medium dense grey slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone and sandstone.		3.0							
		2.00	SPT	N=16 (3,3/3,3,5,5)													
		2.40-2.60	D		2.20	72.47		Medium dense brown slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of sandstone and mudstone.									
										4.0							
		3.00	SPT	N=19 (3,6/6,5,3,5)	3.20	71.47		Medium dense grey slightly clayey gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone and sandstone.									
		3.50-3.60	D														
		4.00	SPT	N=21 (3,4/4,5,5,7)				Becoming dense from 4.00m bgl.		5.0							
		4.60-4.70	D		4.50	70.17		Stiff slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone, mudstone and rare coal.									
		4.80	SPT	N=26 (7,7/6,6,6,8)													
					5.25	69.42	End of Borehole at 5.25m										
</																	



Window Sampler No.

Sheet 1 of 1

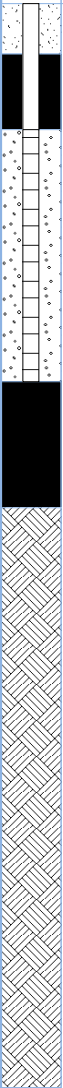
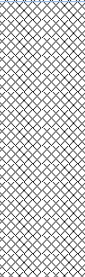
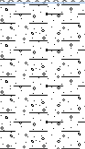
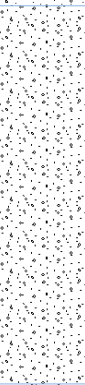
CO-ORDS: 378690E, 407687N

LEVEL: 74.15m OD

DATES: 08/08/23

Checked

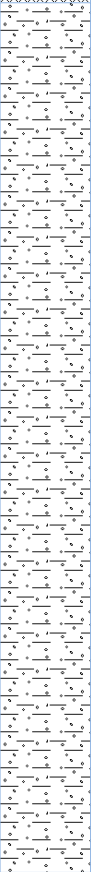
NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description						
		Depth (m)	Type	Results										
		0.10-0.20	ES		0.20	73.95		MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.						
		0.30-0.40	ES		0.50	73.65		MADE GROUND: Brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick, sandstone and mudstone.						
		1.20	SPT		N=6 (2,1/2,1,1,2)	1.60	72.55		MADE GROUND: Greyish brown slightly sandy slightly gravelly clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, mudstone and coal.					
			1.90-2.00 2.00	D SPT	N=18 (4,4/5,5,3,5)				2.20	71.95		Firm orangish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, mudstone and coal.		
				2.30-2.40	D							2.50	71.65	
		2.60-2.80	D	3.00	SPT	N=13 (2,3/2,3,3,5)	4.00	70.15		Medium dense grey gravelly SAND. Sand is fine to coarse. Gravel is sub-angular to sub-rounded of sandstone and mudstone.				
		3.80-3.90 3.90	D SPT							N≥50 (11,11/50 for 250mm)	4.30	69.85		Stiff greyish brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, coal and mudstone.
			End of Borehole at 4.30m											
</														

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. Inspection pit excavated to 1.20m bgl.
3. Groundwater encountered at 2.10m bgl.
4. Terminated at 4.30m bgl due to refusal.
5. Installed with 0.50m plain pipe and 1.00m slotted pipe.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD						Borehole Log		Window Sampler No.
PROJECT NO: C5394						CO-ORDS: 378704E, 407661N		WS103
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 73.77m OD		Sheet 1 of 1
CLIENT: MORGAN SINDALL						DATES: 08/08/23		Hole Type
								WS
								Scale
								1:30
						Logged	Checked	
						PH	NS	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10-0.20	ES		0.20	73.57		MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.
		0.50	ES					MADE GROUND: Firm greyish dark brown slightly sandy slightly gravelly clay with low cobble content. Sand is fine to coarse. Gravel is sub-angular fine to coarse of brick, coal, sandstone and mudstone. Cobbles are sub-angular of brick up to 250mm in diameter.
		1.20	SPT	N=24 (3,5/7,6,6,5)				
		1.50	ES					
		1.90	D		1.80	71.97		Firm grey mottled orange slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone and mudstone.
		2.00	SPT	N=20 (3,4/5,6,5,4)	2.00	71.77		Medium dense grey slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone and mudstone.
		3.00	D SPT	N=26 (3,4/6,6,6,8)				
								Becoming dense from 3.00m bgl.
		4.00	SPT	N≥50 (5,8/50 for 275mm)	4.00	69.77		Stiff grey slightly gravelly CLAY. Gravel is sub-rounded fine to coarse of mudstone and sandstone.
		4.20	D					
					4.45	69.32		End of Borehole at 4.45m
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Inspection pit excavated to 1.20m bgl. 3. Groundwater encountered at 2.00m bgl. 4. Terminated at 4.425m bgl due to refusal. 5. Installed with 0.50m plain pipe and 1.00m slotted pipe.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

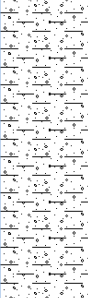
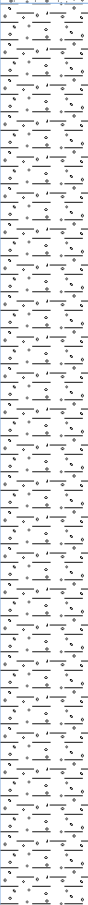
BROWNFIELD SOLUTIONS LTD							Borehole Log		Window Sampler No.		
									WS104		
									Sheet 1 of 1		
PROJECT NO: C5394							CO-ORDS: 378699E, 407620N		Hole Type		
									WS		
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 70.92m OD		Scale		
									1:30		
CLIENT: MORGAN SINDALL							DATES: 08/08/23		Logged		
									Checked		
									PH		
									NS		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.05			0.05	70.87		MADE GROUND: Black tarmacadam.			
		0.20	D					MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).			
		0.40	ES		0.30	70.62		MADE GROUND: Loose black gravelly sand with moderate ash content. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of coal, slag, metal, brick, mudstone and sandstone.			
											
		1.20	SPT	N=6 (2,1/1,2,1,2)							
		1.40	ES								
		2.00	SPT	N=10 (3,4/3,2,3,2)	2.00	68.92		Firm grey slightly gravelly CLAY. Gravel is sub-rounded fine to coarse of sandstone and mudstone.			
		2.50	D								
		3.00	SPT	N=18 (3,3/3,4,4,7)							
		3.50	D								
		4.00	SPT	N=25 (3,5/5,5,7,8)				Becoming stiff from 4.00m bgl.			
		4.50	D								
		5.00	SPT	N=38 (5,6/6,7,9,16)							
								End of Borehole at 5.45m			
					5.45	65.47					

 BROWNFIELD SOLUTIONS LTD							Borehole Log		Window Sampler No.	
									WS105	
									Sheet 1 of 1	
PROJECT NO: C5394							CO-ORDS: 378707E, 407696N		Hole Type	
									WS	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 74.01m OD		Scale	
									1:30	
CLIENT: MORGAN SINDALL							DATES: 08/08/23		Logged	Checked
									NA	NS
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.10-0.20	ES		0.20	73.81		MADE GROUND TOPSOIL: Grass over dark brown slightly sandy clay with rootlets. Sand is fine to coarse.		
		0.20-0.40	ES							
					0.40	73.61		MADE GROUND: Brown slightly clayey gravelly sand. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone and sandstone.		
		0.90-1.00	ES		1.20	72.81		MADE GROUND: Black mottled brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone, sandstone and coal.		
		1.20	SPT	N=25 (2,3/3,7,7,8)						
		1.30-1.50	ES							
		2.00	SPT	N=7 (1,1/2,3,1,1)	1.90	72.11		MADE GROUND: Firm orange mottled grey slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone and sandstone (Reworked).		
		2.10-2.20	ES							
					3.00			Soft grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is sub-rounded fine to coarse of sandstone and mudstone.		
		3.00	SPT	N=25 (5,5/5,6,6,8)	3.50-3.60			Becoming stiff from 3.00m bgl.		
		3.50-3.60	D		3.80					
		3.80	SPT	N=22 (5,4/3,4,6,9)	4.50-4.60					
		4.50-4.60	D		4.90					
		4.90	SPT	N=28 (4,4/6,7,7,8)	5.35	68.66		End of Borehole at 5.35m		
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. Inspection pit excavated to 1.20m bgl. 3. Groundwater encountered at 1.80m bgl. 4. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

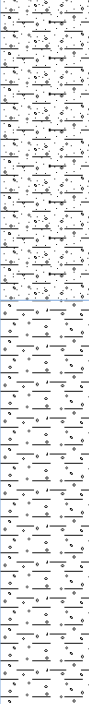
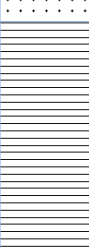
BROWNFIELD SOLUTIONS LTD							Borehole Log		Window Sampler No.	
PROJECT NO: C5394							CO-ORDS: 378739E, 407567N		WS106	
									Sheet 1 of 1	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 70.47m OD		Hole Type	
									WS	
CLIENT: MORGAN SINDALL							DATES: 08/08/23		Scale	
									1:30	
							Logged	Checked		
							PH			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.15-1.20	ES		0.10 0.15	70.37 70.32		MADE GROUND: Black tarmacadam.		
		0.40	SPT	N=38 (15,15/13,11,7,7)				MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).		
		0.85	SPT	N≥50 (7,8/50 for 200mm)				MADE GROUND: Brownish grey sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of brick, concrete, metal, sandstone and mudstone.		
					1.20	69.27		End of Borehole at 1.20m		

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. HP101 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378787E, 407459N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 69.83m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 08/08/23		Logged NA	Checked NS
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results						
	0.00-0.30	ES					MADE GROUND: Grass over black slightly gravelly clayey sand with rootlets. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone and sandstone.		
	0.30-1.10	ES		0.30	69.53				
				1.10	68.73		MADE GROUND: Black slightly clayey gravelly sand with moderate ash content and low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick, slag, flint, coal, sandstone and mudstone. Cobbles are sub-angular of flint and sandstone up to 200mm in diameter.	1.0	
							End of Trial Pit at 1.10m		
								2.0	
								3.0	
								4.0	
								5.0	
Remarks		1. Clearance of services by BSL engineer using CAT & Genny. 2. No groundwater encountered. 3. Completed at 1.10m bgl. 4. Backfilled with arisings upon completion						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

 BROWNFIELD SOLUTIONS LTD						Trial Pit Log		No. HP102 Sheet 1 of 1	
PROJECT NO: C5394						CO-ORDS: 378681E, 407578N		Hole Type TP	
PROJECT NAME: STAR ACADEMY, RADCLIFFE						LEVEL: 70.30m OD		Scale 1:25	
CLIENT: MORGAN SINDALL						DATES: 11/08/23		Logged MB Checked NS	
Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
	Depth (m)	Type	Results				MADE GROUND: Black tarmacadam.		
							MADE GROUND: Grey slightly sandy gravel. Sand is fine to coarse. Gravel is sub-angular fine to coarse of limestone (sub-base).		
							MADE GROUND: Dark brown slightly clayey gravelly sand. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of sandstone, coal, slag and mudstone.		
0.60 ES 0.70-1.20 ES			0.60	69.70		End of Trial Pit at 1.20m		1.0	
1.20			69.10				2.0		
							3.0		
							4.0		
							5.0		
Remarks		1. Clearance of services by BSL engineer using CAT & Genny. 2. Small groundwater seepage encountered at 1.10m bgl. 3. Completed at 1.20m bgl. 4. Reinstated with cold-lay tarmacadam upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.	
									RO101	
									Sheet 1 of 2	
PROJECT NO: C5394							CO-ORDS: 378669E, 407721N		Hole Type	
									RO	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 75.02m OD		Scale	
									1:125	
CLIENT: MORGAN SINDALL							DATES: 08/08/23		Logged	Checked
									PH	NS
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.50	74.52		TOPSOIL (DRILLERS DESCRIPTION).		
								Sandy gravelly CLAY (DRILLERS DESCRIPTION).		1.0
					5.50	69.52		Gravelly CLAY (DRILLERS DESCRIPTION).		3.0
									4.0	
									5.0	
									6.0	
									7.0	
									8.0	
									9.0	
									10.0	
									11.0	
									12.0	
									13.0	
									14.0	
									15.0	
									16.0	
									17.0	
									18.0	
									19.0	
					20.50	54.52		MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).		20.0
										21.0
										22.0
										23.0
										24.0
										25.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.						
									R0101						
									Sheet 2 of 2						
PROJECT NO: C5394							CO-ORDS: 378669E, 407721N		Hole Type						
									RO						
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 75.02m OD		Scale						
									1:125						
CLIENT: MORGAN SINDALL							DATES: 08/08/23		Logged	Checked					
									PH	NS					
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description							
		Depth (m)	Type	Results											
										26.0					
										27.0					
										28.0					
										29.0					
										30.0					
										31.0					
										32.0					
										33.0					
										34.0					
										35.0					
										36.0					
										37.0					
										38.0					
										39.0					
										40.0					
					40.50	34.52									41.0
					40.70	34.32							COAL (DRILLERS DESCRIPTION).		
													MUDSTONE (DRILLERS DESCRIPTION).		
															42.0
					42.50	32.52							SILTSTONE (DRILLERS DESCRIPTION).		
															43.0
															44.0
															45.0
					45.00	30.02							End of Borehole at 45.00m		
															46.0
															47.0
															48.0
													49.0		
								50.0							
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane						

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.					
									RO102					
									Sheet 1 of 2					
PROJECT NO: C5394							CO-ORDS: 378667E, 407687N		Hole Type					
									RO					
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 74.66m OD		Scale					
									1:125					
CLIENT: MORGAN SINDALL							DATES: 09/08/23		Logged	Checked				
									PH	NS				
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description						
		Depth (m)	Type	Results										
					0.50	74.16		TOPSOIL (DRILLERS DESCRIPTION).	1.0					
								Sandy gravelly CLAY (DRILLERS DESCRIPTION).						
										5.50	69.16		Brown gravelly CLAY (DRILLERS DESCRIPTION).	2.0
														3.0
														4.0
														5.0
														6.0
														7.0
														8.0
														9.0
				10.0										
				11.0										
										12.50	62.16		SANDSTONE (DRILLERS DESCRIPTION).	12.0
									13.0					
										14.00	60.66		Grey MUDSTONE ((DRILLERS DESCRIPTION).	14.0
														15.0
														16.0
														17.0
														18.0
														19.0
														20.0
														21.0
					17.80	56.86		COAL (DRILLERS DESCRIPTION)	22.0					
					18.00	56.66		Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	23.0					
										22.50	52.16		Orangish brown SILTSTONE (DRILLERS DESCRIPTION).	24.0
										24.50	50.16		Grey SILTSTONE DRILLERS DESCRIPTION).	25.0
Remarks														
1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.														
ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane														



Rotary Open Hole Borehole No.

Sheet 2 of 2

CO-ORDS: 378667E, 407687N

LEVEL: 74.66m OD

DATES: 09/08/23

Logged	Checked
PH	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description					
		Depth (m)	Type	Results									
					30.00	44.66	XXXXXXXXXX	Grey MUDSTONE (DRILLERS DESCRIPTION).	26.0				
							XXXXXXXXXX		27.0				
							XXXXXXXXXX		28.0				
							XXXXXXXXXX		29.0				
							XXXXXXXXXX		30.0				
							XXXXXXXXXX		31.0				
							XXXXXXXXXX		32.0				
							XXXXXXXXXX		33.0				
							XXXXXXXXXX		34.0				
							XXXXXXXXXX		35.0				
							XXXXXXXXXX		36.0				
							XXXXXXXXXX		37.0				
							XXXXXXXXXX		38.0				
							XXXXXXXXXX		39.0				
							XXXXXXXXXX		40.0				
							40.50		34.16	XXXXXXXXXX	Grey SILTSTONE (DRILLERS DESCRIPTION)	41.0	
										XXXXXXXXXX		42.0	
										XXXXXXXXXX		43.0	
										XXXXXXXXXX		44.0	
										XXXXXXXXXX		45.0	
					XXXXXXXXXX	46.0							
					XXXXXXXXXX	47.0							
					XXXXXXXXXX	48.0							
					XXXXXXXXXX	49.0							
					XXXXXXXXXX	50.0							
					45.00	29.66		End of Borehole at 45.00m					
					Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.	
									RO103	
									Sheet 1 of 2	
PROJECT NO: C5394							CO-ORDS: 378687E, 407701N		Hole Type	
									RO	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 74.32m OD		Scale	
									1:125	
CLIENT: MORGAN SINDALL							DATES: 10/08/23		Logged	Checked
									MB	NS
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	74.12		TOPSOIL: Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. CLAY (DRILLERS DESCRIPTION). Sandy gravelly CLAY (DRILLERS DESCRIPTION).	1.0	
					1.00	73.32			2.0	
									3.0	
					3.90	70.42		CLAY (DRILLERS DESCRIPTION).	4.0	
									5.0	
									6.0	
									7.0	
									8.0	
									9.0	
									10.0	
									11.0	
									12.0	
									13.0	
									14.0	
									15.0	
									16.0	
					17.20	57.12		Grey MUDSTONE (DRILLERS DESCRIPTION).	17.0	
									18.0	
									19.0	
									20.0	
					21.20	53.12		Brown MUDSTONE (DRILLERS DESCRIPTION).	21.0	
									22.0	
									23.0	
									24.0	
									25.0	
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Borehole installed with 18m plain and 2m slotted pipe.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.		
									RO103		
									Sheet 2 of 2		
PROJECT NO: C5394							CO-ORDS: 378687E, 407701N		Hole Type		
									RO		
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 74.32m OD		Scale		
									1:125		
CLIENT: MORGAN SINDALL							DATES: 10/08/23		Logged	Checked	
									MB	NS	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					26.50	47.82		Grey MUDSTONE (DRILLERS DESCRIPTION).	26.0		
					28.20	46.12			27.0		
								Reddish brown MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	28.0		
									29.0		
								30.0			
								31.0			
								32.0			
								33.0			
								34.0			
								35.0			
						35.90	38.42	COAL (DRILLERS DESCRIPTION).	36.0		
					36.20	38.12	Grey MUDSTONE (DRILLERS DESCRIPTION).		37.0		
									38.0		
									39.0		
									40.0		
									41.0		
									42.0		
									43.0		
									44.0		
						45.00	29.32		End of Borehole at 45.00m	45.0	
										46.0	
										47.0	
										48.0	
										49.0	
										50.0	
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Borehole installed with 18m plain and 2m slotted pipe.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.	
									RO104	
									Sheet 1 of 2	
PROJECT NO: C5394							CO-ORDS: 378702E, 407678N		Hole Type	
									RO	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 73.91m OD		Scale	
									1:125	
CLIENT: MORGAN SINDALL							DATES: 14/08/23		Logged	Checked
									MB	NS
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	73.71		MADE GROUND TOPSOIL : Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone.	1.0	
					1.20	72.71		MADE GROUND: Brown slightly gravelly clayey sand with low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick and mudstone. Cobbles are sub-angular of brick up to 200mm in diameter.	2.0	
					3.80	70.11		Sandy gravelly CLAY (DRILLERS DESCRIPTION).	3.0	
								CLAY (DRILLERS DESCRIPTION).	4.0	
									5.0	
									6.0	
									7.0	
									8.0	
									9.0	
									10.0	
									11.0	
									12.0	
									13.0	
									14.0	
									15.0	
									16.0	
					16.70	57.21		Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	17.0	
									18.0	
									19.0	
									20.0	
									21.0	
									22.0	
									23.0	
									24.0	
									25.0	
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Borehole installed with 17.50m plain and 2.50m slotted pipe.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	



Rotary Open Hole Borehole No.

Sheet 2 of 2

CO-ORDS: 378702E, 407678N

LEVEL: 73.91m OD

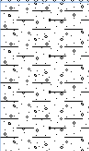
DATES: 14/08/23

Logged	Checked
MB	NS

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description					
		Depth (m)	Type	Results									
					25.50	48.41		Brown MUDSTONE (DRILLERS DESCRIPTION).	26.0				
												27.0	
													28.0
													29.0
													30.0
													31.0
													32.0
													33.0
													34.0
													35.0
													36.0
													37.0
													38.0
													39.0
												40.0	
												41.0	
												42.0	
												43.0	
												44.0	
												45.0	
												46.0	
												47.0	
												48.0	
												49.0	
												50.0	

1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny.
2. No groundwater encountered.
3. Open hole drilling with air flush.
4. Borehole completed at 45.00m bgl.
5. No recorded loss of flush.
6. Borehole installed with 17.50m plain and 2.50m slotted pipe.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD							Rotary Open Hole Borehole No.			
							Borehole Log			
							RO105			
							Sheet 1 of 2			
PROJECT NO: C5394							CO-ORDS: 378692E, 407652N			
PROJECT NAME: STAR ACADEMY, RADCLIFFE							Hole Type			
							RO			
							Scale			
							1:125			
CLIENT: MORGAN SINDALL							DATES: 15/08/23			
							Logged	Checked		
							MB	NS		
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	73.32		MADE GROUND TOPSOIL: Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone.	1.0	
					1.20	72.32			MADE GROUND: Brown slightly gravelly clayey sans with low cobble content. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick and mudstone. Cobbles are sub-angular of brick up to 200mm in diameter. Sandy gravelly CLAY (DRILLERS DESCRIPTION).	2.0
					3.80	69.72				CLAY (DRILLERS DESCRIPTION).
								4.0		
								5.0		
								6.0		
								7.0		
								8.0		
								9.0		
								10.0		
								11.0		
					11.80	61.72		Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	12.0	
									13.0	
									14.0	
									15.0	
									16.0	
									17.0	
									18.0	
									19.0	
									20.0	
									21.0	
			21.80	51.72		COAL (DRILLERS DESCRIPTION).	22.0			
			22.10	51.42		Grey MUDSTONE (DRILLERS DESCRIPTION).	23.0			
							24.0			
			24.20	49.32		Brown MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	25.0			
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with water flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

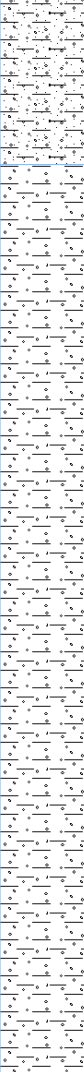
 BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No. RO105 Sheet 2 of 2	
PROJECT NO: C5394							CO-ORDS: 378692E, 407652N		Hole Type RO	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 73.52m OD		Scale 1:125	
CLIENT: MORGAN SINDALL							DATES: 15/08/23		Logged MB Checked NS	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
										26.0
										27.0
										28.0
										29.0
										30.0
										31.0
										32.0
										33.0
										34.0
										35.0
					35.80	37.72				36.0
					36.10	37.42		COAL (DRILLERS DESCRIPTION).		36.0
								Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).		37.0
										38.0
										39.0
										40.0
										41.0
										42.0
										43.0
										44.0
					45.00	28.52		End of Borehole at 45.00m		45.0
										46.0
										47.0
										48.0
										49.0
										50.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with water flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.	
									RO106	
									Sheet 1 of 2	
PROJECT NO: C5394							CO-ORDS: 378712E, 407639N		Hole Type	
									RO	
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 71.06m OD		Scale	
									1:125	
CLIENT: MORGAN SINDALL							DATES: 11/08/23		Logged	Checked
									MB	NS
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					0.20	70.86		MADE GROUND: Black tarmacadam.	1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0 23.0 24.0 25.0	
					0.90	70.16		MADE GROUND: Brown sandy gravel. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of brick and sandstone.		
					2.50	68.56		Sandy gravelly CLAY (DRILLERS DESCRIPTION).		
								CLAY (DRILLERS DESCRIPTION).		
										
										
										
										
										
										
										
										
										
								Grey MUDSTOE AND SILTSTONE (DRILLERS DESCRIPTION).		
										
										
										
										
										
										
										
										
										
										
										
										
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with water flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane		

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.					
									RO106					
									Sheet 2 of 2					
PROJECT NO: C5394							CO-ORDS: 378712E, 407639N		Hole Type					
									RO					
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 71.06m OD		Scale					
									1:125					
CLIENT: MORGAN SINDALL							DATES: 11/08/23		Logged	Checked				
									MB	NS				
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description						
		Depth (m)	Type	Results										
					25.50	45.56		COAL (DRILLERS DESCRIPTION). Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	26.0					
					25.80	45.26								
														27.0
														28.0
														29.0
					29.50	41.56		Reddish brown MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).		30.0				
										31.0				
										32.0				
										33.0				
										34.0				
										35.0				
										36.0				
										37.0				
										38.0				
										39.0				
					39.50	31.56		COAL (DRILLERS DESCRIPTION). Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).		40.0				
					39.80	31.26								
										41.0				
										42.0				
										43.0				
										44.0				
					45.00	26.06		End of Borehole at 45.00m		45.0				
										46.0				
										47.0				
										48.0				
										49.0				
										50.0				
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with water flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane					

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.		
									RO107		
									Sheet 1 of 2		
PROJECT NO: C5394							CO-ORDS: 378708E, 407667N		Hole Type		
									RO		
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 73.72m OD		Scale		
									1:125		
CLIENT: MORGAN SINDALL							DATES: 10/08/23		Logged	Checked	
									MB	NS	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.20	73.52		TOPSOIL: Grass over dark brown slightly gravelly slightly sandy clay. Sand is fine to coarse. Gravel is sub-angular to sub-rounded fine to coarse of mudstone. Sandy gravelly CLAY (DRILLERS DESCRIPTION).	1.0		
										2.0	
										3.0	
					3.80	69.92			CLAY (DRILLERS DESCRIPTION)	4.0	
										5.0	
										6.0	
										7.0	
										8.0	
										9.0	
										10.0	
										11.0	
										12.0	
										13.0	
										14.0	
										15.0	
										16.0	
					16.30	57.42				Grey MUDSTONE (DRILLERS DESCRIPTION).	17.0
											18.0
											19.0
											20.0
											21.0
											22.0
											23.0
									24.0		
									25.0		

BROWNFIELD SOLUTIONS LTD							Borehole Log		Rotary Open Hole Borehole No.							
									RO107							
									Sheet 2 of 2							
PROJECT NO: C5394							CO-ORDS: 378708E, 407667N		Hole Type							
									RO							
PROJECT NAME: STAR ACADEMY, RADCLIFFE							LEVEL: 73.72m OD		Scale							
									1:125							
CLIENT: MORGAN SINDALL							DATES: 10/08/23		Logged	Checked						
									MB	NS						
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description								
		Depth (m)	Type	Results												
					25.70	48.02		COAL (DRILLERS DESCRIPTION).	26.0							
					25.90	47.82		Grey MUDSTONE (DRILLERS DESCRIPTION).	27.0							
									28.0							
									29.0							
									30.0							
									31.0							
									32.0							
									33.0							
									34.0							
									35.0							
									36.0							
									37.0							
									38.0							
									39.0							
					39.00	34.72		Grey mudstone and siltstone (DRILLERS DESCRIPTION)	40.0							
					40.50	33.22		COAL (DRILLERS DESCRIPTION). Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	41.0							
					40.80	32.92			42.0							
									43.0							
									44.0							
					45.00	28.72		End of Borehole at 45.00m	45.0							
									46.0							
									47.0							
									48.0							
									49.0							
									50.0							
					Remarks			1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.							ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD							Rotary Open Hole Borehole No.		
							Borehole Log		
							RO108		
							Sheet 1 of 2		
PROJECT NO: C5394							CO-ORDS: 378709E, 407707N		
PROJECT NAME: STAR ACADEMY, RADCLIFFE							Hole Type		
							RO		
							Scale		
							1:125		
CLIENT: MORGAN SINDALL							DATES: 09/08/23		
							Logged	Checked	
							PH	NS	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.20	72.96		CLAY (DRILLERS DESCRIPTION).	1.0
								Brown sandy gravelly CLAY (DRILLERS DESCRIPTION).	2.0
					4.00	70.16		Brown gravelly CLAY (DRILLERS DESCRIPTION).	3.0
									4.0
									5.0
									6.0
									7.0
									8.0
									9.0
									10.0
									11.0
									12.0
					19.20	54.96		Grey MUDSTONE AND SILTSTONE (DRILLERS DESCRIPTION).	13.0
									14.0
					20.50	53.66		Grey MUDSTONE (DRILLERS DESCRIPTION).	15.0
									16.0
									17.0
									18.0
									19.0
									20.0
									21.0
									22.0
									23.0
									24.0
									25.0
Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

BROWNFIELD SOLUTIONS LTD							Rotary Open Hole Borehole No.				
							Borehole Log				
							RO108				
							Sheet 2 of 2				
PROJECT NO: C5394							CO-ORDS: 378709E, 407707N				
PROJECT NAME: STAR ACADEMY, RADCLIFFE							Hole Type				
							RO				
							Scale				
							1:125				
CLIENT: MORGAN SINDALL							DATES: 09/08/23				
							Logged	Checked			
							PH	NS			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					25.50	48.66					
					25.70	48.46		COAL (DRILLERS DESCRIPTION)	26.0		
								Grey MUDSTONE (DRILLERS DESCRIPTION).			
										27.0	
						27.50	46.66		COAL (DRILLERS DESCRIPTION)		
					27.70	46.46		Grey MUDSTONE (DRILLERS DESCRIPTION).	28.0		
										29.0	
						29.50	44.66		Grey SILTSTONE (DRILLERS DESCRIPTION).		
										30.0	
										31.0	
										32.0	
										33.0	
										34.0	
										35.0	
							35.50	38.66		Grey MUDSTONE (DRILLERS DESCRIPTION).	36.0
											37.0
											38.0
											39.0
											40.0
											41.0
							41.30	32.86		Orangish brown SILTSTONE (DRILLERS DESCRIPTION).	42.0
											43.0
											44.0
							45.00	29.16		End of Borehole at 45.00m	45.0
											46.0
											47.0
											48.0
											49.0
											50.0
		Remarks		1. Utility clearance undertaken utilising EM and GPR techniques by GeoUK engineers. Hole also scanned out with CAT & Genny. 2. No groundwater encountered. 3. Open hole drilling with air flush. 4. Borehole completed at 45.00m bgl. 5. No recorded loss of flush. 6. Backfilled with arisings upon completion.						ES = Environmental Sample D = Disturbed Sample B = Bulk Sample LB = Large Bulk Sample U = Undisturbed Sample UT = Undisturbed Thin Wall Sample SPT = Standard Penetration Test PID = Photoionization Detector (ppm) PPM = Part Per Million HSV = Hand Shear Vane	

APPENDIX C

Chemical Testing Results

Human Health Assessment Summary - Soils Test Data			Soil Type: Location: Depth:			WS101 0.20-0.60	WS103 1.50	WS106 0.15-1.20	TP101 0.00-0.20	TP103 0.00-0.20	TP106 040-1.25	TP108 0.10-1.00	HP101 0.30-1.10
Contaminant	GAC (mg/kg)	No. Samples	Min. Value	Max. Value	No. Samples ≥GAC								
Moisture Content	-	8	6.70	22.00	-	11.00	14.00	6.70	22.00	17.00	11.00	15.00	17.00
Soil Organic Matter	-	8	1.40	6.70	-	2.00	2.30	1.40	5.90	4.80	5.30	6.00	6.70
pH	-	8	5.40	12.00	-	7.00	7.20	12.00	5.40	6.10	7.70	7.10	7.20
Water Soluble Sulphate (2:1 Leachate Equivalent) (mg/l)	Note mg/l	8	5.10	339.00	-	17.70	96.90	9.90	5.10	22.10	44.10	322.00	339.00
Arsenic	40	8	8.10	43.00	2	12.00	13.00	8.10	13.00	16.00	27.00	43.00	43.00
Cadmium	85	8	< LOD	<LOD	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (III)	910	8	14.00	35.00	0	34.00	18.00	21.00	14.00	16.00	35.00	18.00	17.00
Hexavalent Chromium (VI)	6	8	< LOD	<LOD	0	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Copper	7100	8	29.00	530.00	0	33.00	63.00	29.00	39.00	56.00	190.00	380.00	530.00
Lead	310	8	23.00	140.00	0	53.00	49.00	23.00	100.00	100.00	120.00	140.00	130.00
Mercury	1.2	8	< LOD	<LOD	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel	180	8	11.00	67.00	0	38.00	22.00	11.00	13.00	16.00	38.00	67.00	64.00
Selenium	430	8	< LOD	<LOD	0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	40000	8	57.00	270.00	0	210.00	100.00	57.00	80.00	110.00	83.00	140.00	270.00
Cyanide (free)	0	0	0.00	<LOD	0								
Phenol (total)	1300	0	0.00	<LOD	0								
Naphthalene	5.6	8	< LOD	2.60	0	< 0.05	0.13	0.70	< 0.05	< 0.05	1.00	0.32	2.60
Acenaphthylene	4700	8	< LOD	0.08	0	< 0.05	< 0.05	0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05
Acenaphthene	4700	8	< LOD	1.60	0	< 0.05	0.15	0.59	< 0.05	0.07	1.60	0.21	0.57
Fluorene	3800	8	< LOD	1.40	0	< 0.05	0.09	0.42	< 0.05	0.05	1.40	0.17	0.53
Phenanthrene	1500	8	0.25	11.00	0	0.25	0.68	3.70	0.37	0.50	11.00	2.00	6.00
Anthracene	35000	8	0.05	3.00	0	0.05	0.14	1.00	0.09	0.10	3.00	0.37	1.10
Fluoranthene	1600	8	0.39	13.00	0	0.39	0.99	5.40	0.69	0.97	13.00	3.00	7.30
Pyrene	3800	8	0.36	12.00	0	0.36	0.89	5.30	0.70	0.92	12.00	2.70	6.60
Benzo(a)anthracene	14	8	0.20	6.10	0	0.20	0.46	2.40	0.37	0.46	6.10	1.40	3.10
Chrysene	31	8	0.23	5.70	0	0.23	0.51	2.20	0.38	0.59	5.70	1.40	3.10
Benzo(b)fluoranthene	4.0	8	0.27	6.90	1	0.27	0.50	2.50	0.49	0.68	6.90	1.60	3.80
Benzo(k)fluoranthene	110	8	0.09	2.40	0	0.09	0.29	1.20	0.20	0.30	2.40	0.78	1.00
Benzo(a)pyrene	5.3	8	0.20	5.70	1	0.20	0.44	2.50	0.41	0.52	5.70	1.50	3.10
Indeno(1,2,3-cd)pyrene	46	8	0.12	2.50	0	0.12	0.21	0.98	0.19	0.27	2.50	0.64	1.30
Dibenz(a,h)anthracene	0.32	8	< LOD	0.65	2	< 0.05	< 0.05	0.25	< 0.05	< 0.05	0.65	0.21	0.33
Benzo(ghi)perylene	360	8	0.12	2.80	0	0.12	0.26	1.20	0.23	0.32	2.80	0.76	1.60
Asbestos Detected (Detected or Not-Detected)	Y	8	0.00	0.00	0	Not-detectedNot-detectedNot-detectedNot-detectedNot-detectedNot-detectedNot-detectedNot-detected							
Asbestos Quantification (% w/w)	0.001	0	0.00	<LOD	0								
Petroleum Hydrocarbons Aliphatic >EC5-EC6	78	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aliphatic >EC6-EC8	230	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aliphatic >EC8-EC10	65	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aliphatic >EC10-EC12	330	4	< LOD	3.00	0	< 1.0	3.00				< 1.0	< 1.0	
Petroleum Hydrocarbons Aliphatic >EC12-EC16	2400	4	< LOD	14.00	0	< 2.0	14.00				4.80	< 2.0	
Petroleum Hydrocarbons Aliphatic >EC16-EC35	92000	4	< LOD	90.00	0	< 10	90.00				< 10	< 10	
Petroleum Hydrocarbons Aliphatic >EC35-EC40	92000	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aromatic >EC5-EC7	690	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aromatic >EC7-EC8	1800	4	< LOD	<LOD	0	< 0.10	< 0.10				< 0.10	< 0.10	
Petroleum Hydrocarbons Aromatic >EC8-EC10	110	4	< LOD	<LOD	0	< 1.0	< 1.0				< 1.0	< 1.0	
Petroleum Hydrocarbons Aromatic >EC10-EC12	590	4	< LOD	7.80	0	< 2.0	6.10				7.80	< 2.0	
Petroleum Hydrocarbons Aromatic >EC12-EC16	2300	4	< LOD	35.00	0	< 10	27.00				35.00	13.00	
Petroleum Hydrocarbons Aromatic >EC16-EC21	1900	4	12.00	110.00	0	12.00	110.00				62.00	30.00	
Petroleum Hydrocarbons Aromatic >EC21-EC35	1900	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
Petroleum Hydrocarbons Aromatic >EC35-EC40	1900	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
Benzene	0.70	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
Toluene	1900	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
Ethyl benzene	190	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
o-Xylene	210	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
m- & p-Xylene	370	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
MTBE	84	4	< LOD	<LOD	0	< 0.005	< 0.005				< 0.005	< 0.005	
Chloroethene (Vinyl Chloride)	0.00100	0	0.00	<LOD	0								
1,2-Dichloroethane (1,2-DCA)	0.013	0	0.00	<LOD	0								
1,1,1-Trichloroethane	18.0	0	0.00	<LOD	0								
1,1,2,2-Tetrachloroethane	8.0	0	0.00	<LOD	0								
1,1,1,2-Tetrachloroethane	3.5	0	0.00	<LOD	0								
Tetrachloroethene (PCE)	0.40	0	0.00	<LOD	0								
Tetrachloromethane (carbon tetrachloride)	0.056	0	0.00	<LOD	0								
Trichloroethene (TCE)	0.036	0	0.00	<LOD	0								
Trichloromethane (chloroform)	2.10	0	0.00	<LOD	0								
Chlorobenzene	1.00	0	0.00	<LOD	0								
1, 2 Dichlorobenzene	57	0	0.00	<LOD	0								
1, 3 Dichlorobenzene	1.10	0	0.00	<LOD	0								
1, 4 Dichlorobenzene	150	0	0.00	<LOD	0								
1, 2, 3 Trichlorobenzene	3.70	0	0.00	<LOD	0								
1, 2, 4 Trichlorobenzene	6.40	0	0.00	<LOD	0								
1, 3, 5 Trichlorobenzene	0.81	0	0.00	<LOD	0								
1, 2, 3, 4 Tetrachlorobenzene	56	0	0.00	<LOD	0								
1, 2, 3, 5 Tetrachlorobenzene	1.90	0	0.00	<LOD	0								
1, 2, 4, 5 Tetrachlorobenzene	1.70	0	0.00	<LOD	0								
Pentachlorobenzene	30.0	0	0.00	<LOD	0								
Hexachlorobenzene	5.7	0	0.00	<LOD	0								
Hexachlorobutadiene	0.78	0	0.00	<LOD	0								
ADD CoC	0.0	0	0.00	<LOD	0								
ADD CoC	0.0	0	0.00	<LOD	0								
Mean Average SOM						4.3							
Mean Average pH						7.5							
Residential without Homegrown Produce 2.5% SOM						Values in RED are > the relevant screening levels and further assessment is required. Exceedance of the screening levels alone may not mean a risk is posed.							
Job Number: C5394													
Client: Morgan Sindall													
Site: Star Academy, Radcliffe													
Soil Group Type Combined Results													

C5394 Human Health Soils Assessment Workbook (Geotechnics), Summary Human Health © Copyright Brownfield Solutions Ltd

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Analytical Report Number : 23-52916

Project / Site name:	Star Academy	Samples received on:	24/08/2023
Your job number:	C5394	Samples instructed on/ Analysis started on:	24/08/2023
Your order number:	MB C5394 4490	Analysis completed by:	31/08/2023
Report Issue Number:	1	Report issued on:	01/09/2023
Samples Analysed:	8 soil samples		


Signed:

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

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 23-52916
Project / Site name: Star Academy
Your Order No: MB C5394 4490

Lab Sample Number				2791526	2791527	2791528	2791529	2791530
Sample Reference				WS101	WS103	WS106	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.60	1.50	0.15-1.20	0.00-0.20	0.00-0.20
Date Sampled				08/08/2023	10/08/2023	10/08/2023	10/08/2023	08/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	0.01	NONE	11	14
Total mass of sample received				kg	0.001	NONE	0.8	0.8

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

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	7	-	9.8	-	-
pH - Automated	pH Units	N/A	MCERTS	7	7.2	12	5.4	6.1
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	35	190	20	10	44
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0177	0.0969	0.0099	0.0051	0.0221
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.7	96.9	9.9	5.1	22.1
Organic Matter (automated)	%	0.1	MCERTS	2	2.3	1.4	5.9	4.8

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.13	0.7	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.15	0.59	< 0.05	0.07
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.09	0.42	< 0.05	0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.25	0.68	3.7	0.37	0.5
Anthracene	mg/kg	0.05	MCERTS	0.05	0.14	1	0.09	0.1
Fluoranthene	mg/kg	0.05	MCERTS	0.39	0.99	5.4	0.69	0.97
Pyrene	mg/kg	0.05	MCERTS	0.36	0.89	5.3	0.7	0.92
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.2	0.46	2.4	0.37	0.46
Chrysene	mg/kg	0.05	MCERTS	0.23	0.51	2.2	0.38	0.59
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.27	0.5	2.5	0.49	0.68
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.09	0.29	1.2	0.2	0.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.2	0.44	2.5	0.41	0.52
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.12	0.21	0.98	0.19	0.27
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.12	0.26	1.2	0.23	0.32

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	2.28	5.74	30.2	4.12	5.75
-----------------------------	-------	-----	-----------	------	------	------	------	------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13	8.1	13	16
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	34	18	21	14	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	18	21	15	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	63	29	39	56
Lead (aqua regia extractable)	mg/kg	1	MCERTS	53	49	23	100	100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	22	11	13	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	100	57	80	110

Analytical Report Number: 23-52916

Project / Site name: Star Academy

Your Order No: MB C5394 4490

Lab Sample Number				2791526	2791527	2791528	2791529	2791530
Sample Reference				WS101	WS103	WS106	TP101	TP103
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-0.60	1.50	0.15-1.20	0.00-0.20	0.00-0.20
Date Sampled				08/08/2023	10/08/2023	10/08/2023	10/08/2023	08/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	-	-
Toluene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	-	-
Ethylbenzene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	-	-
p & m-xylene #	mg/kg	0.005	NONE	-	< 0.005	< 0.005	-	-
o-xylene	mg/kg	0.005	MCERTS	-	< 0.005	< 0.005	-	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.005	NONE	-	< 0.005	< 0.005	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	-	< 1.0	3	-	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	-	< 2.0	14	-	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	< 8.0	22	-	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	-	< 8.0	68	-	-
TPH-CWG - Aliphatic >EC16 - EC35 _{EH_CU_1D_AL}	mg/kg	10	MCERTS	-	< 10	90	-	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	-	< 10	110	-	-

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	-	< 0.10	< 0.10	-	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	-	< 2.0	6.1	-	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	< 10	27	-	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	-	12	110	-	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	-	17	140	-	-

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

Analytical Report Number: 23-52916

Project / Site name: Star Academy

Your Order No: MB C5394 4490

Lab Sample Number				2791531	2791532	2791533
Sample Reference				TP106	TP108	HP101
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				040-1.25	0.10-1.00	0.30-1.10
Date Sampled				09/08/2023	09/08/2023	09/08/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	15	17
Total mass of sample received	kg	0.001	NONE	1	1.2	0.4

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

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	-	6.5	-
pH - Automated	pH Units	N/A	MCERTS	7.7	7.1	7.2
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	88	640	680
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0441	0.322	0.339
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	44.1	322	339
Organic Matter (automated)	%	0.1	MCERTS	5.3	6	6.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1	0.32	2.6
Acenaphthylene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	1.6	0.21	0.57
Fluorene	mg/kg	0.05	MCERTS	1.4	0.17	0.53
Phenanthrene	mg/kg	0.05	MCERTS	11	2	6
Anthracene	mg/kg	0.05	MCERTS	3	0.37	1.1
Fluoranthene	mg/kg	0.05	MCERTS	13	3	7.3
Pyrene	mg/kg	0.05	MCERTS	12	2.7	6.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	6.1	1.4	3.1
Chrysene	mg/kg	0.05	MCERTS	5.7	1.4	3.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	6.9	1.6	3.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	2.4	0.78	1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.7	1.5	3.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.5	0.64	1.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.65	0.21	0.33
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.8	0.76	1.6

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	76	17.2	42
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	27	43	43
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	35	18	17
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	18	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	190	380	530
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	140	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	38	67	64
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	83	140	270

Analytical Report Number: 23-52916

Project / Site name: Star Academy

Your Order No: MB C5394 4490

Lab Sample Number				2791531	2791532	2791533
Sample Reference				TP106	TP108	HP101
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				040-1.25	0.10-1.00	0.30-1.10
Date Sampled				09/08/2023	09/08/2023	09/08/2023
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			

Monoaromatics & Oxygenates

Benzene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	-
Toluene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	-
Ethylbenzene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	-
p & m-xylene #	mg/kg	0.005	NONE	< 0.005	< 0.005	-
o-xylene	mg/kg	0.005	MCERTS	< 0.005	< 0.005	-
MTBE (Methyl Tertiary Butyl Ether)	mg/kg	0.005	NONE	< 0.005	< 0.005	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	4.8	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	< 8.0	-
TPH-CWG - Aliphatic >EC16 - EC35 _{EH_CU_1D_AL}	mg/kg	10	MCERTS	< 10	< 10	-
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	< 10	-

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	-
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	7.8	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	35	13	-
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	62	30	-
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	100	43	-

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

Analytical Report Number : 23-52916
Project / Site name: Star Academy

* 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 *
2791526	WS101	None Supplied	0.20-0.60	Brown loam and sand with gravel.
2791527	WS103	None Supplied	1.5	Brown clay and loam.
2791528	WS106	None Supplied	0.15-1.20	Brown loam and sand with gravel and brick.
2791529	TP101	None Supplied	0.00-0.20	Brown loam and sand with gravel and vegetation.
2791530	TP103	None Supplied	0.00-0.20	Brown loam and sand with gravel and vegetation.
2791531	TP106	None Supplied	0.40-1.25	Brown gravelly loam.
2791532	TP108	None Supplied	0.10-1.00	Brown gravelly loam.
2791533	HP101	None Supplied	0.30-1.10	Brown gravelly loam.

Analytical Report Number : 23-52916

Project / Site name: Star Academy

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS

Analytical Report Number : 23-52916

Project / Site name: Star Academy

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
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK 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 - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

- Data reported unaccredited due to quality control parameter failure associated with this result; other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

Sample Deviation Report



Analytical Report Number : 23-52916

Project / Site name: Star Academy

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP106	None Supplied	S	2791531	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
TP106	None Supplied	S	2791531	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
TP106	None Supplied	S	2791531	c	TPH in (Soil)	L076-PL	c
TP108	None Supplied	S	2791532	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
TP108	None Supplied	S	2791532	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
TP108	None Supplied	S	2791532	c	TPH in (Soil)	L076-PL	c
WS103	None Supplied	S	2791527	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS103	None Supplied	S	2791527	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS103	None Supplied	S	2791527	c	TPH in (Soil)	L076-PL	c
WS106	None Supplied	S	2791528	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS106	None Supplied	S	2791528	c	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	c
WS106	None Supplied	S	2791528	c	TPH in (Soil)	L076-PL	c

APPENDIX D

Geotechnical Testing Results

Peter Holland
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

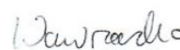
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
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Watford,
Herts,
WD18 8YS

e: p.holland@brownfield-solutions.co.uk

t: 01923 225404
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Analytical Report Number : 23-52906

Project / Site name:	Star Academy	Samples received on:	24/08/2023
Your job number:	C5394	Samples instructed on/ Analysis started on:	24/08/2023
Your order number:	NS C5394 110	Analysis completed by:	31/08/2023
Report Issue Number:	1	Report issued on:	01/09/2023
Samples Analysed:	9 soil samples		



Signed:

Joanna Wawrzeczko
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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

Analytical Report Number: 23-52906

Project / Site name: Star Academy

Your Order No: NS C5394 110

Lab Sample Number				2791479	2791480	2791481	2791482	2791483
Sample Reference				WS101	WS102	WS103	WS104	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.60-4.70	2.30-2.40	4.20	3.50-3.60	0.50
Date Sampled				08/08/2023	08/08/2023	08/08/2023	08/08/2023	09/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.7	12	9	9.8	12
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.5	0.6	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.3	6.9	8.4	8.3	7.3
Total Sulphate as SO ₄	%	0.005	MCERTS	0.024	-	0.023	-	-
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0687	0.0226	0.0617	0.0547	< 0.0013
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	68.7	-	61.7	-	-
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.9	-	3.2	-	-
Total Sulphur	%	0.005	MCERTS	0.092	-	0.09	-	-
Ammoniacal Nitrogen as NH ₄	mg/kg	0.5	MCERTS	< 0.5	-	0.7	-	-
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	-	0.07	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	-	< 2.0	-	-

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	14	-	11	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	7.1	-	5.7	-	-

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

Analytical Report Number: 23-52906

Project / Site name: Star Academy

Your Order No: NS C5394 110

Lab Sample Number				2791484	2791485	2791486	2791487
Sample Reference				TP104	TP107	TP108	TP109
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	1.50-1.60	2.10	1.60-2.00
Date Sampled				10/08/2023	10/08/2023	09/08/2023	09/08/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	48
Moisture Content	%	0.01	NONE	8.7	24	16	3.9
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.6	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	7.4	6.8	7.4
Total Sulphate as SO ₄	%	0.005	MCERTS	-	-	-	0.018
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0821	0.0406	0.0484	0.0286
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	28.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	1.4
Total Sulphur	%	0.005	MCERTS	-	-	-	0.013
Ammoniacal Nitrogen as NH ₄	mg/kg	0.5	MCERTS	-	-	-	2.1
Ammonium as NH ₄ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-	0.21
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	2.4

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	7
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	3.5

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

Analytical Report Number : 23-52906
Project / Site name: Star Academy

* 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 *
2791479	WS101	None Supplied	4.60-4.70	Brown clay.
2791480	WS102	None Supplied	2.30-2.40	Brown clay.
2791481	WS103	None Supplied	4.2	Brown clay.
2791482	WS104	None Supplied	3.50-3.60	Brown clay.
2791483	TP101	None Supplied	0.5	Brown sandy loam with vegetation.
2791484	TP104	None Supplied	0.50-1.00	Brown clay.
2791485	TP107	None Supplied	1.50-1.60	Brown clay.
2791486	TP108	None Supplied	2.1	Brown clay.
2791487	TP109	None Supplied	1.60-2.00	Brown loam and sand with gravel and stones.

Analytical Report Number : 23-52906

Project / Site name: Star Academy

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
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	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK 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.

APPENDIX E

Monitoring Results

Ground Gas Monitoring Results



CLIENT:	Date	Operator	Analysr	Weather Observations			Temp (°C)	Pressure Trend	Min Barometric Pressure (mb)	Notes
MORGAN SINDALL	30/08/2023	SJ	GFM436	Intermittent cloud	Light breeze	Cool	17	Rising	1007	
JOB NO.	13/09/2023	NHA	GFM436	Sunny	Light breeze	Cool	17	Rising	1010	
C5394	27/09/2023	PH	GFM436	Light rain	Light breeze	Cool	17	Falling	1001	
SITE:										
STAR ACADEMY, RADCLIFFE										

Notes: mb = milibars; CH₄ = methane; LEL = lower explosive limit = 5%v/v; CO₂ = carbon dioxide; O₂ = oxygen; CO=carbon monoxide; H₂S = hydrogen sulphide; TVOC= Total volatile organic compounds; PPM = parts per million. Where the flow is less than the limit of detection of the instrument, the detection limit is reported (Highlighted in green). Gas Screening Values (GSVs) are rounded to 3 decimal places. Calibration Records for analysers used available on request.

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH ₄ (%v/v)		CH ₄ (%LEL)		CO ₂ (%v/v)		O ₂ (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH ₄) (l/hr)	Gas Screening Value (CO ₂) (l/hr)	Notes
				Atmospheric Pressure	Relative Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H ₂ S	TVOC (PID)					
				Summary Statistics																			
Max. values:				1015	55.0	21.7	37.8	41.6	26.1	832.0	522.0	11.7	9.6	21.5	20.8	22.0	1.0	1.0	6.1	20.0	0.000	0.832	Highlight Box - Methane >1.0% v/v
Min. values:				996	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.7	0.0	0.0	0.0	0.6	1.2	0.000	0.000	Highlight Box - Carbon Dioxide >5.0% v/v
Top Bottom				Worst-case GSVs based on maximum recorded steady flow and maximum individual peak concentrations:																	15.725	4.423	Highlight Box - Water above Response Zone
30/08/2023	PM	Ambient Start			999			0.0		0.0		0.0		20.9									
		WS101	0.60	1.20		55.0	0.0	0.0	32.3	26.1	646.0	522.0	2.4	2.3	0.5	4.7	0.0	0.0		0.86	1.22	0.000	0.000
	WS102	0.50	1.50		0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.9	3.7	12.0	0.0	0.0		0.90	1.50	0.000	0.000	
	WS103	0.50	1.50		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.8	17.4	19.6	10.0	0.0		0.70	1.50	0.000	0.000	
	WS104	1.00	2.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	5.0	10.6	11.0	10.0	0.0		1.28	2.07	0.000	0.000	
	RO103	18.00	20.00		0.0		5.7	0.0	0.0	0.0	0.0		0.0		20.6	0.0	0.0		0.73	19.73	0.000	0.000	
	RO104	17.50	20.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	18.8	20.7	22.0	0.0		3.15	19.17	0.000	0.000	
	PM	Ambient End			996			0.0		0.0		0.0		20.8									
	13/09/2023	AM	Ambient			1015	0.0	0.0	0.0		0.0		0.0		21.4								
WS101			0.60	1.20		0.0	0.0	0.0	41.6	9.0	832.0	180.0	3.2	1.8	0.1	14.9	10.0	0.0	>300 / 7.80	0.85	2.10	0.000	0.000
WS102		0.50	1.50		0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.9	13.8	18.4	0.0	1.0	1.0	0.87	1.40	0.000	0.000	Hole purged prior to steady measurements
WS103		0.50	1.50		0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	4.2	14.3	15.4	0.0	0.0	1.0	0.60	1.45	0.000	0.000	Hole purged prior to steady measurements
WS104		1.00	2.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	2.4	5.6	16.4	1.0	0.0	0.0	1.25	1.95	0.000	0.000	Hole purged prior to steady measurements
RO103		18.00	20.00		-4.0	a	0.0	0.0	0.0	0.0	0.0	1.8	1.2	18.1	19.6	0.0	0.0	1.0	1.37	18.84	0.000	0.000	Hole purged prior to steady measurements
RO104		17.50	20.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	19.8	20.8	0.0	0.0	1.0	6.08	18.70	0.000	0.000	Hole purged prior to steady measurements
PM		Ambient End			1010		0.0	0.0		0.0		0.0		20.8									
27/09/2023	AM	Ambient			1001			0.0		0.0		0.0		21.2									
		WS101	0.60	1.20		0.0	15.5	0.0	23.9	4.2	478.0	84.0	4.6	0.4	0.1	19.0	0.0	0.0	>>>	0.70	2.00	0.000	0.000
	WS102	0.50	1.50		0.0	21.7	0.3	0.0	0.0	0.0	0.0	4.8	0.0	7.1	19.3	0.0	0.0	1.0	1.00	1.50	0.000	0.014	Hole purged prior to steady measurements
	WS103	0.50	1.50		0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.4	15.2	15.2	0.0	0.0	1.0	0.73	1.50	0.000	0.000	Hole purged prior to steady measurements
	WS104	1.00	2.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	9.6	7.6	6.1	0.0	0.0	1.0	1.34	2.00	0.000	0.000	Hole purged prior to steady measurements
	RO103	18.00	20.00		0.0	19.5	37.8	0.0	0.0	0.0	0.0	2.2	0.3	17.1	20.6	0.0	0.0	0.0	0.60	19.30	0.000	0.832	Hole purged prior to steady measurements
	RO104	17.50	20.00		0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	15.6	20.4	0.0	0.0	0.0	4.10	20.00	0.000	0.000	Increased steady likely due to rising GW after purge.
	PM	Ambient End			996			0.0		0.0		0.0		21.5									

APPENDIX F

Waste Assessment Report

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:

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



GPAM2-MXR2Z-RQT5X

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

Job name

Star Academy, Radcliffe

Description/Comments

Project

C5394

Site

Classified by

Name: **Jake Wheaton**
 Date: **12 Oct 2023 09:39 GMT**
 Telephone: **01606334844**
 Company: **Brownfield Solutions Limited**
Brownfield Solutions Ltd
173-183 Witton Street
Northwich
CW9 5LP

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

Hazardous Waste Classification

Date

07 Oct 2021

Next 3 year Refresher due by Oct 2024

Purpose of classification

2 - Material Characterisation

Address of the waste

Spring Lane, Radcliffe, Manchester

Post Code **M26 2SZ**

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

Construction of a 'super teaching block' with a sports hall annexe and extensive MUGA / Sports Pitches

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

Excavation of soils for foundations and earthworks.

Description of the waste

Mixture of slightly gravelly slightly sandy CLAY, slightly sandy CLAY, slightly sandy GRAVEL, Tarmacadam, gravelly SAND, slightly clayey gravelly SAND.



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH03	0.5	Non Hazardous		3
2	BH03[2]	2	Non Hazardous		5
3	BH03A	2	Non Hazardous		7
4	BH01	0.5	Non Hazardous		9
5	HD03	1	Non Hazardous		11
6	DCP07	0.2	Non Hazardous		13
7	DCP08	0.2	Non Hazardous		16
8	HDP04	0.5	Non Hazardous		19
9	HD01	1	Non Hazardous		22
10	DCP05	0.5	Non Hazardous		25
11	BH02	0.5	Non Hazardous		28
12	DS01[2]	0.5	Non Hazardous		31
13	DS04	0.5	Non Hazardous		34
14	DS05	0.5	Non Hazardous		37
15	HD02	0.5	Non Hazardous		40
16	BH04	1	Non Hazardous		43

Related documents

#	Name	Description
1	BSL Suite	waste stream template used to create this Job

Report

Created by: Jake Wheaton

Created date: 12 Oct 2023 09:39 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	45
Appendix B: Rationale for selection of metal species	46
Appendix C: Version	46



Classification of sample: BH03

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

Sample details

Sample name:	LoW Code:
BH03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				7.2	pH		7.2	pH	7.2 pH		
2	arsenic { arsenic trioxide }				13	mg/kg	1.32	17.164	mg/kg	0.00172 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				40	mg/kg	1.126	45.036	mg/kg	0.0045 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	42	mg/kg	1.56	65.512	mg/kg	0.0042 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				20	mg/kg	1.579	31.59	mg/kg	0.00316 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.5	mg/kg	1.405	0.703	mg/kg	0.0000703 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				110	mg/kg	2.774	305.156	mg/kg	0.0305 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.36	mg/kg		0.36	mg/kg	0.000036 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				0.03	mg/kg		0.03	mg/kg	0.000003 %	✓	
		205-917-1	208-96-8									
12	acenaphthene				0.39	mg/kg		0.39	mg/kg	0.000039 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.36	mg/kg		0.36	mg/kg	0.000036 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				1.6	mg/kg		1.6	mg/kg	0.00016 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.37	mg/kg		0.37	mg/kg	0.000037 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		1.7 mg/kg		1.7 mg/kg	0.00017 %	✓	
17	pyrene	204-927-3	129-00-0		1.4 mg/kg		1.4 mg/kg	0.00014 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.37 mg/kg		0.37 mg/kg	0.000037 %	✓	
19	chrysene	601-048-00-0	205-923-4	218-01-9	0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.4 mg/kg		0.4 mg/kg	0.00004 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.3 mg/kg		0.3 mg/kg	0.00003 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.1 mg/kg		0.1 mg/kg	0.00001 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.04 mg/kg		0.04 mg/kg	0.000004 %	✓	
25	benzo[ghi]perylene	205-883-8	191-24-2		0.13 mg/kg		0.13 mg/kg	0.000013 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	0.3 mg/kg		0.3 mg/kg	0.00003 %	✓	
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0487 %		

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 Determinand - 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: BH03[2]

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

Sample details

Sample name:	LoW Code:
BH03[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				6.6	pH		6.6	pH	6.6 pH		
2	arsenic { arsenic trioxide }				7.2	mg/kg	1.32	9.506	mg/kg	0.000951 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22	mg/kg	1.462	32.154	mg/kg	0.00322 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	14	mg/kg	1.56	21.837	mg/kg	0.0014 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				26	mg/kg	1.579	41.067	mg/kg	0.00411 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.7	mg/kg	1.405	0.983	mg/kg	0.0000983 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				82	mg/kg	2.774	227.48	mg/kg	0.0227 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.21	mg/kg		0.21	mg/kg	0.000021 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.12	mg/kg		0.12	mg/kg	0.000012 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				0.06	mg/kg		0.06	mg/kg	0.000006 %	✓	
		201-581-5	85-01-8									
15	anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
17	pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0362 %		

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 Determinand - 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: BH03A

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

Sample details

Sample name:	LoW Code:
BH03A	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				6.1	pH		6.1	pH	6.1 pH		
2	arsenic { arsenic trioxide }				8.9	mg/kg	1.32	11.751	mg/kg	0.00118 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	21.392	mg/kg	0.00214 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	18	mg/kg	1.56	28.077	mg/kg	0.0018 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				16	mg/kg	1.579	25.272	mg/kg	0.00253 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				89	mg/kg	2.774	246.899	mg/kg	0.0247 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8									
15	anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
17	pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0362 %		

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 Determinand - 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: BH01

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

Sample details

Sample name:	LoW Code:
BH01	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				6.8	pH		6.8	pH	6.8 pH		
2	arsenic { arsenic trioxide }				7.5	mg/kg	1.32	9.902	mg/kg	0.00099 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	17	mg/kg	1.56	26.517	mg/kg	0.0017 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				18	mg/kg	1.579	28.431	mg/kg	0.00284 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				60	mg/kg	2.774	166.449	mg/kg	0.0166 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8									
15	anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
17	pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
19	chrysene	601-048-00-0	205-923-4		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.028 %		

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 Determinand - 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: HD03

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

Sample details

Sample name:	LoW Code:
HD03	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				7.4	pH		7.4	pH	7.4 pH		
2	arsenic { arsenic trioxide }				7.3	mg/kg	1.32	9.638	mg/kg	0.000964 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				15	mg/kg	1.462	21.923	mg/kg	0.00219 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				27	mg/kg	1.126	30.399	mg/kg	0.00304 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	16	mg/kg	1.56	24.957	mg/kg	0.0016 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				30	mg/kg	1.579	47.385	mg/kg	0.00474 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				61	mg/kg	2.774	169.223	mg/kg	0.0169 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				0.1	mg/kg		0.1	mg/kg	0.00001 %	✓	
		201-581-5	85-01-8									
15	anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		0.15 mg/kg		0.15 mg/kg	0.000015 %	✓	
17	pyrene	204-927-3	129-00-0		0.14 mg/kg		0.14 mg/kg	0.000014 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.07 mg/kg		0.07 mg/kg	0.000007 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.06 mg/kg		0.06 mg/kg	0.000006 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0309 %		

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 Determinand - 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: DCP07

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

Sample details

Sample name:	LoW Code:
DCP07	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				6.8	pH		6.8	pH	6.8 pH		
2	arsenic { arsenic trioxide }				14	mg/kg	1.32	18.485	mg/kg	0.00185 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18	mg/kg	1.462	26.308	mg/kg	0.00263 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				74	mg/kg	1.126	83.316	mg/kg	0.00833 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	70	mg/kg	1.56	109.187	mg/kg	0.007 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				25	mg/kg	1.579	39.487	mg/kg	0.00395 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.2	mg/kg	1.405	1.686	mg/kg	0.000169 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				180	mg/kg	2.774	499.346	mg/kg	0.0499 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.07	mg/kg		0.07	mg/kg	0.000007 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.17	mg/kg		0.17	mg/kg	0.000017 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.12	mg/kg		0.12	mg/kg	0.000012 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				1.5	mg/kg		1.5	mg/kg	0.00015 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.33	mg/kg		0.33	mg/kg	0.000033 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		2.3 mg/kg		2.3 mg/kg	0.00023 %	✓	
17	pyrene	204-927-3	129-00-0		1.7 mg/kg		1.7 mg/kg	0.00017 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.55 mg/kg		0.55 mg/kg	0.000055 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.66 mg/kg		0.66 mg/kg	0.000066 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.52 mg/kg		0.52 mg/kg	0.000052 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.21 mg/kg		0.21 mg/kg	0.000021 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.36 mg/kg		0.36 mg/kg	0.000036 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.2 mg/kg		0.2 mg/kg	0.00002 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		14.84 mg/kg		14.84 mg/kg	0.00148 %	✓	
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0765 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00148%)



Classification of sample: DCP08

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

Sample details

Sample name:	LoW Code:
DCP08	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.2 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH		PH		6.8	pH		6.8	pH	6.8 pH		
2	arsenic { arsenic trioxide }				9.7	mg/kg	1.32	12.807	mg/kg	0.00128 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				20	mg/kg	1.462	29.231	mg/kg	0.00292 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				31	mg/kg	1.126	34.903	mg/kg	0.00349 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	41	mg/kg	1.56	63.952	mg/kg	0.0041 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				20	mg/kg	1.579	31.59	mg/kg	0.00316 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulfoxeselenide and those specified elsewhere in this Annex }				0.7	mg/kg	1.405	0.983	mg/kg	0.0000983 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				150	mg/kg	2.774	416.122	mg/kg	0.0416 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.05	mg/kg		0.05	mg/kg	0.000005 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.05	mg/kg		0.05	mg/kg	0.000005 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				0.7	mg/kg		0.7	mg/kg	0.00007 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.23	mg/kg		0.23	mg/kg	0.000023 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		1.6 mg/kg		1.6 mg/kg	0.00016 %	✓	
17	pyrene	204-927-3	129-00-0		1.3 mg/kg		1.3 mg/kg	0.00013 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.38 mg/kg		0.38 mg/kg	0.000038 %	✓	
19	chrysene	601-048-00-0	205-923-4	218-01-9	0.42 mg/kg		0.42 mg/kg	0.000042 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.32 mg/kg		0.32 mg/kg	0.000032 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.15 mg/kg		0.15 mg/kg	0.000015 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.23 mg/kg		0.23 mg/kg	0.000023 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.13 mg/kg		0.13 mg/kg	0.000013 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.11 mg/kg		0.11 mg/kg	0.000011 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		16.93 mg/kg		16.93 mg/kg	0.00169 %	✓	
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0592 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00169%)



Classification of sample: HDP04

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

Sample details

Sample name:	LoW Code:
HDP04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				7.8	pH		7.8	pH	7.8 pH		
2	arsenic { arsenic trioxide }				18	mg/kg	1.32	23.766	mg/kg	0.00238 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				81	mg/kg	1.126	91.197	mg/kg	0.00912 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	130	mg/kg	1.56	202.776	mg/kg	0.013 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				21	mg/kg	1.579	33.169	mg/kg	0.00332 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.9	mg/kg	1.405	1.265	mg/kg	0.000126 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				110	mg/kg	2.774	305.156	mg/kg	0.0305 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.53	mg/kg		0.53	mg/kg	0.000053 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				1.2	mg/kg		1.2	mg/kg	0.00012 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.8	mg/kg		0.8	mg/kg	0.00008 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				9.5	mg/kg		9.5	mg/kg	0.00095 %	✓	
		201-581-5	85-01-8									
15	anthracene				2.3	mg/kg		2.3	mg/kg	0.00023 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		12 mg/kg		12 mg/kg	0.0012 %	✓	
17	pyrene	204-927-3	129-00-0		11 mg/kg		11 mg/kg	0.0011 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		3.9 mg/kg		3.9 mg/kg	0.00039 %	✓	
19	chrysene	601-048-00-0	205-923-4		4.2 mg/kg		4.2 mg/kg	0.00042 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		3.4 mg/kg		3.4 mg/kg	0.00034 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		1.6 mg/kg		1.6 mg/kg	0.00016 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		2.9 mg/kg		2.9 mg/kg	0.00029 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		1.2 mg/kg		1.2 mg/kg	0.00012 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.34 mg/kg		0.34 mg/kg	0.000034 %	✓	
25	benzo[ghi]perylene	205-883-8	191-24-2		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		191.1 mg/kg		191.1 mg/kg	0.0191 %	✓	
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0859 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0191%)



Classification of sample: HD01



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

Sample details

Sample name:	LoW Code:
HD01	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
1 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH		PH		8.1	pH		8.1	pH	8.1 pH		
2	arsenic { arsenic trioxide }				24	mg/kg	1.32	31.688	mg/kg	0.00317 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				150	mg/kg	1.126	168.883	mg/kg	0.0169 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	33	mg/kg	1.56	51.474	mg/kg	0.0033 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				49	mg/kg	1.579	77.395	mg/kg	0.00774 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				61	mg/kg	2.774	169.223	mg/kg	0.0169 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				0.09	mg/kg		0.09	mg/kg	0.000009 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.13	mg/kg		0.13	mg/kg	0.000013 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		0.38 mg/kg		0.38 mg/kg	0.000038 %	✓	
17	pyrene	204-927-3	129-00-0		0.44 mg/kg		0.44 mg/kg	0.000044 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
19	chrysene	601-048-00-0	205-923-4	218-01-9	0.21 mg/kg		0.21 mg/kg	0.000021 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.27 mg/kg		0.27 mg/kg	0.000027 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.09 mg/kg		0.09 mg/kg	0.000009 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.2 mg/kg		0.2 mg/kg	0.00002 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.08 mg/kg		0.08 mg/kg	0.000008 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.08 mg/kg		0.08 mg/kg	0.000008 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		15.76 mg/kg		15.76 mg/kg	0.00158 %	✓	
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0526 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00158%)



Classification of sample: DCP05

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

Sample details

Sample name:	LoW Code:
DCP05	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				9.7	pH		9.7	pH	9.7 pH		
2	arsenic { arsenic trioxide }				7.3	mg/kg	1.32	9.638	mg/kg	0.000964 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				9.9	mg/kg	1.462	14.469	mg/kg	0.00145 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				44	mg/kg	1.126	49.539	mg/kg	0.00495 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	40	mg/kg	1.56	62.393	mg/kg	0.004 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				14	mg/kg	1.579	22.113	mg/kg	0.00221 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				57	mg/kg	2.774	158.126	mg/kg	0.0158 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.11	mg/kg		0.11	mg/kg	0.000011 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.38	mg/kg		0.38	mg/kg	0.000038 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.29	mg/kg		0.29	mg/kg	0.000029 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				2.4	mg/kg		2.4	mg/kg	0.00024 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.78	mg/kg		0.78	mg/kg	0.000078 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		3.6 mg/kg		3.6 mg/kg	0.00036 %	✓	
17	pyrene	204-927-3	129-00-0		3.3 mg/kg		3.3 mg/kg	0.00033 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
19	chrysene	601-048-00-0	205-923-4		1.3 mg/kg		1.3 mg/kg	0.00013 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.5 mg/kg		1.5 mg/kg	0.00015 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.5 mg/kg		0.5 mg/kg	0.00005 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.1 mg/kg		1.1 mg/kg	0.00011 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.33 mg/kg		0.33 mg/kg	0.000033 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.09 mg/kg		0.09 mg/kg	0.000009 %	✓	
25	benzo[ghi]perylene	205-883-8	191-24-2		0.42 mg/kg		0.42 mg/kg	0.000042 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		47.16 mg/kg		47.16 mg/kg	0.00472 %	✓	
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0361 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00472%)

Classification of sample: BH02


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

Sample details

Sample name:	LoW Code:
BH02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH		PH		6.7	pH		6.7	pH	6.7 pH		
2	arsenic { arsenic trioxide }				4.1	mg/kg	1.32	5.413	mg/kg	0.000541 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7.6	mg/kg	1.462	11.108	mg/kg	0.00111 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				6	mg/kg	1.126	6.755	mg/kg	0.000676 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	8.4	mg/kg	1.56	13.102	mg/kg	0.00084 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				4.3	mg/kg	1.579	6.792	mg/kg	0.000679 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium selenide and those specified elsewhere in this Annex }				0.5	mg/kg	1.405	0.703	mg/kg	0.0000703 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				81	mg/kg	2.774	224.706	mg/kg	0.0225 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-581-5	85-01-8									
15	anthracene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
17	pyrene	204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
19	chrysene	601-048-00-0	205-923-4	218-01-9	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
23	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
26	TPH (C6 to C40) petroleum group		TPH		12.93 mg/kg		12.93 mg/kg	0.00129 %	✓	
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.028 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00129%)



Classification of sample: DS01[2]

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

Sample details

Sample name:	LoW Code:	
DS01[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m		

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				5.9	pH		5.9	pH	5.9 pH		
2	arsenic { arsenic trioxide }				130	mg/kg	1.32	171.642	mg/kg	0.0172 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				160	mg/kg	1.462	233.849	mg/kg	0.0234 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				190	mg/kg	1.126	213.919	mg/kg	0.0214 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	380	mg/kg	1.56	592.73	mg/kg	0.038 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				31	mg/kg	1.579	48.964	mg/kg	0.0049 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.4	mg/kg	1.405	1.967	mg/kg	0.000197 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				220	mg/kg	2.774	610.312	mg/kg	0.061 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.41	mg/kg		0.41	mg/kg	0.000041 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.54	mg/kg		0.54	mg/kg	0.000054 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.26	mg/kg		0.26	mg/kg	0.000026 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				2.2	mg/kg		2.2	mg/kg	0.00022 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.41	mg/kg		0.41	mg/kg	0.000041 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		2.1 mg/kg		2.1 mg/kg	0.00021 %	✓	
17	pyrene	204-927-3	129-00-0		1.9 mg/kg		1.9 mg/kg	0.00019 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.41 mg/kg		0.41 mg/kg	0.000041 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.45 mg/kg		0.45 mg/kg	0.000045 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.28 mg/kg		0.28 mg/kg	0.000028 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.07 mg/kg		0.07 mg/kg	0.000007 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.16 mg/kg		0.16 mg/kg	0.000016 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.06 mg/kg		0.06 mg/kg	0.000006 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.06 mg/kg		0.06 mg/kg	0.000006 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		44.69 mg/kg		44.69 mg/kg	0.00447 %	✓	
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		0.9 mg/kg		0.9 mg/kg	0.00009 %	✓	
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.172 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Relatively low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00447%)



Classification of sample: DS04

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

Sample details

Sample name:	LoW Code:
DS04	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH		PH		7.6	pH		7.6	pH	7.6 pH		
2	arsenic { arsenic trioxide }				12	mg/kg	1.32	15.844	mg/kg	0.00158 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19	mg/kg	1.462	27.77	mg/kg	0.00278 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				48	mg/kg	1.126	54.043	mg/kg	0.0054 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	39	mg/kg	1.56	60.833	mg/kg	0.0039 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulfoxeselenide and those specified elsewhere in this Annex }				0.5	mg/kg	1.405	0.703	mg/kg	0.0000703 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				90	mg/kg	2.774	249.673	mg/kg	0.025 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.04	mg/kg		0.04	mg/kg	0.000004 %	✓	
		201-469-6	83-32-9									
13	fluorene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		201-695-5	86-73-7									
14	phenanthrene				0.27	mg/kg		0.27	mg/kg	0.000027 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.07	mg/kg		0.07	mg/kg	0.000007 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		0.44 mg/kg		0.44 mg/kg	0.000044 %	✓	
17	pyrene	204-927-3	129-00-0		0.43 mg/kg		0.43 mg/kg	0.000043 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
19	chrysene	601-048-00-0	205-923-4	218-01-9	0.2 mg/kg		0.2 mg/kg	0.00002 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.1 mg/kg		0.1 mg/kg	0.00001 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.05 mg/kg		0.05 mg/kg	0.000005 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		18.1 mg/kg		18.1 mg/kg	0.00181 %	✓	
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0446 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Relatively low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00181%)



Classification of sample: DS05



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

Sample details

Sample name:	LoW Code:
DS05	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				7.8	pH		7.8	pH	7.8 pH		
2	arsenic { arsenic trioxide }				28	mg/kg	1.32	36.969	mg/kg	0.0037 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				29	mg/kg	1.462	42.385	mg/kg	0.00424 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				190	mg/kg	1.126	213.919	mg/kg	0.0214 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	180	mg/kg	1.56	280.767	mg/kg	0.018 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				37	mg/kg	1.579	58.441	mg/kg	0.00584 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				170	mg/kg	2.774	471.605	mg/kg	0.0472 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				21	mg/kg		21	mg/kg	0.0021 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				1	mg/kg		1	mg/kg	0.0001 %	✓	
		205-917-1	208-96-8									
12	acenaphthene				21	mg/kg		21	mg/kg	0.0021 %	✓	
		201-469-6	83-32-9									
13	fluorene				15	mg/kg		15	mg/kg	0.0015 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				65	mg/kg		65	mg/kg	0.0065 %	✓	
		201-581-5	85-01-8									
15	anthracene				14	mg/kg		14	mg/kg	0.0014 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		79 mg/kg		79 mg/kg	0.0079 %	✓	
17	pyrene	204-927-3	129-00-0		73 mg/kg		73 mg/kg	0.0073 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		23 mg/kg		23 mg/kg	0.0023 %	✓	
19	chrysene	601-048-00-0	205-923-4		30 mg/kg		30 mg/kg	0.003 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		23 mg/kg		23 mg/kg	0.0023 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		10 mg/kg		10 mg/kg	0.001 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		19 mg/kg		19 mg/kg	0.0019 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		8.8 mg/kg		8.8 mg/kg	0.00088 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		2.1 mg/kg		2.1 mg/kg	0.00021 %	✓	
25	benzo[ghi]perylene	205-883-8	191-24-2		8.9 mg/kg		8.9 mg/kg	0.00089 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		594.9 mg/kg		594.9 mg/kg	0.0595 %	✓	
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		1.2 mg/kg		1.2 mg/kg	0.00012 %	✓	
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.202 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Relatively low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0595%)



Classification of sample: HD02



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

Sample details

Sample name:	LoW Code:
HD02	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.5 m	

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH		PH		8.8	pH		8.8	pH	8.8 pH		
2	arsenic { arsenic trioxide }				9.7	mg/kg	1.32	12.807	mg/kg	0.00128 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11	mg/kg	1.462	16.077	mg/kg	0.00161 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				43	mg/kg	1.126	48.413	mg/kg	0.00484 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	22	mg/kg	1.56	34.316	mg/kg	0.0022 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				17	mg/kg	1.579	26.851	mg/kg	0.00269 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulfoxeselenide and those specified elsewhere in this Annex }				<0.5	mg/kg	1.405	<0.703	mg/kg	<0.0000703 %		<LOD
	034-002-00-8											
9	zinc { zinc chromate }				49	mg/kg	2.774	135.933	mg/kg	0.0136 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.11	mg/kg		0.11	mg/kg	0.000011 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.2	mg/kg		0.2	mg/kg	0.00002 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.11	mg/kg		0.11	mg/kg	0.000011 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				1.3	mg/kg		1.3	mg/kg	0.00013 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.37	mg/kg		0.37	mg/kg	0.000037 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		1.9 mg/kg		1.9 mg/kg	0.00019 %	✓	
17	pyrene	204-927-3	129-00-0		2 mg/kg		2 mg/kg	0.0002 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.65 mg/kg		0.65 mg/kg	0.000065 %	✓	
19	chrysene	601-048-00-0	205-923-4	218-01-9	0.65 mg/kg		0.65 mg/kg	0.000065 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.58 mg/kg		0.58 mg/kg	0.000058 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.22 mg/kg		0.22 mg/kg	0.000022 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.41 mg/kg		0.41 mg/kg	0.000041 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.11 mg/kg		0.11 mg/kg	0.000011 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.04 mg/kg		0.04 mg/kg	0.000004 %	✓	
25	benzo[ghi]perylene	205-883-8	191-24-2		0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		19.05 mg/kg		19.05 mg/kg	0.00191 %	✓	
27	benzene	601-020-00-8	200-753-7	71-43-2	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9	108-88-3	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	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]	<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7	108-95-2	<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.0293 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Relatively low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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



Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00191%)



Classification of sample: BH04

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

Sample details

Sample name:	LoW Code:
BH04	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				7.5	pH		7.5	pH	7.5 pH		
2	arsenic { arsenic trioxide }				15	mg/kg	1.32	19.805	mg/kg	0.00198 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14	mg/kg	1.462	20.462	mg/kg	0.00205 %	✓	
		215-160-9	1308-38-9									
5	copper { dicopper oxide; copper (I) oxide }				130	mg/kg	1.126	146.365	mg/kg	0.0146 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
6	lead { lead chromate }			1	12	mg/kg	1.56	18.718	mg/kg	0.0012 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
7	nickel { nickel dihydroxide }				40	mg/kg	1.579	63.18	mg/kg	0.00632 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.7	mg/kg	1.405	0.983	mg/kg	0.0000983 %	✓	
	034-002-00-8											
9	zinc { zinc chromate }				22	mg/kg	2.774	61.031	mg/kg	0.0061 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
10	naphthalene				0.04	mg/kg		0.04	mg/kg	0.000004 %	✓	
	601-052-00-2	202-049-5	91-20-3									
11	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
		205-917-1	208-96-8									
12	acenaphthene				0.04	mg/kg		0.04	mg/kg	0.000004 %	✓	
		201-469-6	83-32-9									
13	fluorene				0.04	mg/kg		0.04	mg/kg	0.000004 %	✓	
		201-695-5	86-73-7									
14	phenanthrene				0.47	mg/kg		0.47	mg/kg	0.000047 %	✓	
		201-581-5	85-01-8									
15	anthracene				0.1	mg/kg		0.1	mg/kg	0.00001 %	✓	
		204-371-1	120-12-7									



#	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	fluoranthene	205-912-4	206-44-0		0.57 mg/kg		0.57 mg/kg	0.000057 %	✓	
17	pyrene	204-927-3	129-00-0		0.57 mg/kg		0.57 mg/kg	0.000057 %	✓	
18	benzo[a]anthracene	601-033-00-9	200-280-6		0.31 mg/kg		0.31 mg/kg	0.000031 %	✓	
19	chrysene	601-048-00-0	205-923-4		0.41 mg/kg		0.41 mg/kg	0.000041 %	✓	
20	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.4 mg/kg		0.4 mg/kg	0.00004 %	✓	
21	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.17 mg/kg		0.17 mg/kg	0.000017 %	✓	
22	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.34 mg/kg		0.34 mg/kg	0.000034 %	✓	
23	indeno[123-cd]pyrene	205-893-2	193-39-5		0.28 mg/kg		0.28 mg/kg	0.000028 %	✓	
24	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	benzo[ghi]perylene	205-883-8	191-24-2		0.25 mg/kg		0.25 mg/kg	0.000025 %	✓	
26	TPH (C6 to C40) petroleum group		TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
27	benzene	601-020-00-8	200-753-7		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
28	toluene	601-021-00-3	203-625-9		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
29	ethylbenzene	601-023-00-4	202-849-4		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
30	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
31	phenol	604-001-00-2	203-632-7		<0.3 mg/kg		<0.3 mg/kg	<0.00003 %		<LOD
32	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			<0.1 mg/kg	1.884	<0.188 mg/kg	<0.0000188 %		<LOD
Total:								0.034 %		

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 Determinand - 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

Appendix A: Classifier defined and non GB MCL determinands

• pH (CAS Number: PH)

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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

■ **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

■ **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

■ **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

■ **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

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 chromate}

Worst case species based on hazard statements

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

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.283.5774.10667 (10 Oct 2023)
HazWasteOnline Database: 2023.283.5774.10667 (10 Oct 2023)



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

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:

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



7ZBNN-RPGUP-BGWSK

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

Job name

C5394 Star Academy, Radcliffe

Description/Comments

Project

Star Academy, Radcliffe

Site

C5394

Classified by

Name: **Jack Mather**
Date: **07 Sep 2023 14:09 GMT**
Telephone: **01606334844**
Company: **Brownfield Solutions Limited**
173-183 Witton Street
Northwich
CW9 5LP

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

Hazardous Waste Classification

Date

09 Feb 2023

Next 3 year Refresher due by Feb 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Spring Lane, Radcliffe, Manchester

Post Code M26 2SZ

SIC for the process giving rise to the waste

41100 Development of building projects

Description of industry/producer giving rise to the waste

"The construction of a 'super teaching block' with a sports hall annex and extensive MUGA / Sports Pitches"

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

Excavation of soils for foundations and earthworks.

Description of the waste

Slightly gravelly slightly sandy CLAY, slightly sandy CLAY, slightly sandy GRAVEL, Tarmacadam, gravelly SAND, slightly clayey gravelly SAND.



Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS101	0.20-0.60	Non Hazardous	HP 8	3
2	WS103	1.50	Non Hazardous		5
3	WS106	0.15-1.20	Hazardous		7
4	TP101	0.00-0.20	Non Hazardous		10
5	TP103	0.00-0.20	Non Hazardous		12
6	TP106	0.40-1.25	Non Hazardous		14
7	TP108	0.10-1.00	Non Hazardous		16
8	HP101	0.30-1.10	Non Hazardous		18

Related documents

#	Name	Description
1	BSL Suite	waste stream template used to create this Job

Report

Created by: Jack Mather

Created date: 07 Sep 2023 14:09 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	20
Appendix B: Rationale for selection of metal species	21
Appendix C: Version	21



Classification of sample: WS101

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

Sample details

Sample name:	LoW Code:
WS101	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.20-0.60 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
11%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	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								
1	pH				7 pH		7	pH	7pH		
2	arsenic { arsenic trioxide }				12 mg/kg	1.32	14.101	mg/kg	0.00141 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				34 mg/kg	1.462	44.227	mg/kg	0.00442 %	✓	
		215-160-9	1308-38-9								
6	copper { dicopper oxide; copper (I) oxide }				33 mg/kg	1.126	33.067	mg/kg	0.00331 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	53 mg/kg		47.17	mg/kg	0.00472 %	✓	
	082-001-00-6										
8	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								
9	nickel { nickel dihydroxide }				38 mg/kg	1.579	53.419	mg/kg	0.00534 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
10	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
11	zinc { zinc oxide }				210 mg/kg	1.245	232.637	mg/kg	0.0233 %	✓	
	030-013-00-7	215-222-5	1314-13-2								
12	naphthalene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8								
14	acenaphthene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9								



#	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							
15	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
16	phenanthrene	201-581-5	85-01-8		0.25 mg/kg		0.223 mg/kg	0.0000222 %	✓	
17	anthracene	204-371-1	120-12-7		0.05 mg/kg		0.0445 mg/kg	0.00000445 %	✓	
18	fluoranthene	205-912-4	206-44-0		0.39 mg/kg		0.347 mg/kg	0.0000347 %	✓	
19	pyrene	204-927-3	129-00-0		0.36 mg/kg		0.32 mg/kg	0.000032 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.2 mg/kg		0.178 mg/kg	0.0000178 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.23 mg/kg		0.205 mg/kg	0.0000205 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.27 mg/kg		0.24 mg/kg	0.000024 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.09 mg/kg		0.0801 mg/kg	0.00000801 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.2 mg/kg		0.178 mg/kg	0.0000178 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.12 mg/kg		0.107 mg/kg	0.0000107 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		0.12 mg/kg		0.107 mg/kg	0.0000107 %	✓	
Total:								0.0431 %		

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 Determinand - 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: WS103

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

Sample details

Sample name:	LoW Code:
WS103	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1.50 m	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
14%	
(wet weight correction)	

Hazard properties

None identified

Determinands

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

#	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								
1	pH				7.2 pH		7.2	pH	7.2 pH		
2	arsenic { arsenic trioxide }				13 mg/kg	1.32	14.761	mg/kg	0.00148 %	✓	
	033-003-00-0	215-481-4	1327-53-3								
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6								
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	22.625	mg/kg	0.00226 %	✓	
		215-160-9	1308-38-9								
6	copper { dicopper oxide; copper (I) oxide }				63 mg/kg	1.126	61.001	mg/kg	0.0061 %	✓	
	029-002-00-X	215-270-7	1317-39-1								
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	49 mg/kg		42.14	mg/kg	0.00421 %	✓	
	082-001-00-6										
8	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								
9	nickel { nickel dihydroxide }				22 mg/kg	1.579	29.884	mg/kg	0.00299 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
10	selenium { selenium compounds with the exception of cadmium selenosulfide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
11	zinc { zinc oxide }				100 mg/kg	1.245	107.045	mg/kg	0.0107 %	✓	
	030-013-00-7	215-222-5	1314-13-2								
12	naphthalene				0.13 mg/kg		0.112	mg/kg	0.0000112 %	✓	
	601-052-00-2	202-049-5	91-20-3								
13	acenaphthylene				<0.05 mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8								
14	acenaphthene				0.15 mg/kg		0.129	mg/kg	0.0000129 %	✓	
		201-469-6	83-32-9								



#	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							
15	fluorene	201-695-5	86-73-7		0.09 mg/kg		0.0774 mg/kg	0.00000774 %	✓	
16	phenanthrene	201-581-5	85-01-8		0.68 mg/kg		0.585 mg/kg	0.0000585 %	✓	
17	anthracene	204-371-1	120-12-7		0.14 mg/kg		0.12 mg/kg	0.000012 %	✓	
18	fluoranthene	205-912-4	206-44-0		0.99 mg/kg		0.851 mg/kg	0.0000851 %	✓	
19	pyrene	204-927-3	129-00-0		0.89 mg/kg		0.765 mg/kg	0.0000765 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.46 mg/kg		0.396 mg/kg	0.0000396 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.51 mg/kg		0.439 mg/kg	0.0000439 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.5 mg/kg		0.43 mg/kg	0.000043 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.29 mg/kg		0.249 mg/kg	0.0000249 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.44 mg/kg		0.378 mg/kg	0.0000378 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.21 mg/kg		0.181 mg/kg	0.0000181 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		0.26 mg/kg		0.224 mg/kg	0.0000224 %	✓	
28	TPH (C6 to C40) petroleum group		TPH		12 mg/kg		10.32 mg/kg	0.00103 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
Total:								0.0297 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00103%)



Classification of sample: WS106

 **Hazardous Waste**
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:
WS106	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 03 * (Soil and stones containing hazardous substances)
0.15-1.20 m	
Moisture content:	
6.7%	
(wet weight correction)	

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 12 pH)

Determinands

Moisture content: 6.7% Wet Weight Moisture Correction applied (MC)

#	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									
1	pH				12	pH		12	pH	12pH		
2	arsenic { arsenic trioxide }				8.1	mg/kg	1.32	9.978	mg/kg	0.000998 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
3	cadmium { cadmium sulfide }			1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6									
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				21	mg/kg	1.462	28.636	mg/kg	0.00286 %	✓	
		215-160-9	1308-38-9									
6	copper { dicopper oxide; copper (I) oxide }				29	mg/kg	1.126	30.463	mg/kg	0.00305 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	23	mg/kg		21.459	mg/kg	0.00215 %	✓	
	082-001-00-6											
8	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									
9	nickel { nickel dihydroxide }				11	mg/kg	1.579	16.21	mg/kg	0.00162 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
10	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											
11	zinc { zinc oxide }				57	mg/kg	1.245	66.195	mg/kg	0.00662 %	✓	
	030-013-00-7	215-222-5	1314-13-2									



#	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							
12	naphthalene				0.7 mg/kg		0.653 mg/kg	0.0000653 %	✓	
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				0.05 mg/kg		0.0466 mg/kg	0.00000466 %	✓	
		205-917-1	208-96-8							
14	acenaphthene				0.59 mg/kg		0.55 mg/kg	0.000055 %	✓	
		201-469-6	83-32-9							
15	fluorene				0.42 mg/kg		0.392 mg/kg	0.0000392 %	✓	
		201-695-5	86-73-7							
16	phenanthrene				3.7 mg/kg		3.452 mg/kg	0.000345 %	✓	
		201-581-5	85-01-8							
17	anthracene				1 mg/kg		0.933 mg/kg	0.0000933 %	✓	
		204-371-1	120-12-7							
18	fluoranthene				5.4 mg/kg		5.038 mg/kg	0.000504 %	✓	
		205-912-4	206-44-0							
19	pyrene				5.3 mg/kg		4.945 mg/kg	0.000494 %	✓	
		204-927-3	129-00-0							
20	benzo[a]anthracene				2.4 mg/kg		2.239 mg/kg	0.000224 %	✓	
	601-033-00-9	200-280-6	56-55-3							
21	chrysene				2.2 mg/kg		2.053 mg/kg	0.000205 %	✓	
	601-048-00-0	205-923-4	218-01-9							
22	benzo[b]fluoranthene				2.5 mg/kg		2.333 mg/kg	0.000233 %	✓	
	601-034-00-4	205-911-9	205-99-2							
23	benzo[k]fluoranthene				1.2 mg/kg		1.12 mg/kg	0.000112 %	✓	
	601-036-00-5	205-916-6	207-08-9							
24	benzo[a]pyrene; benzo[def]chrysene				2.5 mg/kg		2.333 mg/kg	0.000233 %	✓	
	601-032-00-3	200-028-5	50-32-8							
25	indeno[123-cd]pyrene				0.98 mg/kg		0.914 mg/kg	0.0000914 %	✓	
		205-893-2	193-39-5							
26	dibenz[a,h]anthracene				0.25 mg/kg		0.233 mg/kg	0.0000233 %	✓	
	601-041-00-2	200-181-8	53-70-3							
27	benzo[ghi]perylene				1.2 mg/kg		1.12 mg/kg	0.000112 %	✓	
		205-883-8	191-24-2							
28	TPH (C6 to C40) petroleum group				250.1 mg/kg		233.343 mg/kg	0.0233 %	✓	
			TPH							
29	benzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
30	toluene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
31	ethylbenzene				<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
32	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]							
Total:								0.0439 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
•	Speciated Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0233%)



Classification of sample: TP101



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

Sample details

Sample name:	LoW Code:	
TP101	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.00-0.20 m		
Moisture content:		
22%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#	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							
1	pH		PH		5.4 pH		5.4 pH	5.4 pH		
2	arsenic { arsenic trioxide }				13 mg/kg	1.32	13.388 mg/kg	0.00134 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				14 mg/kg	1.462	15.96 mg/kg	0.0016 %	✓	
		215-160-9	1308-38-9							
6	copper { dicopper oxide; copper (I) oxide }				39 mg/kg	1.126	34.25 mg/kg	0.00342 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	100 mg/kg		78 mg/kg	0.0078 %	✓	
	082-001-00-6									
8	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							
9	nickel { nickel dihydroxide }				13 mg/kg	1.579	16.016 mg/kg	0.0016 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
10	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									
11	zinc { zinc oxide }				80 mg/kg	1.245	77.67 mg/kg	0.00777 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
12	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
14	acenaphthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		201-469-6	83-32-9							



#	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							
15	fluorene	201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
16	phenanthrene	201-581-5	85-01-8		0.37 mg/kg		0.289 mg/kg	0.0000289 %	✓	
17	anthracene	204-371-1	120-12-7		0.09 mg/kg		0.0702 mg/kg	0.0000702 %	✓	
18	fluoranthene	205-912-4	206-44-0		0.69 mg/kg		0.538 mg/kg	0.0000538 %	✓	
19	pyrene	204-927-3	129-00-0		0.7 mg/kg		0.546 mg/kg	0.0000546 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.37 mg/kg		0.289 mg/kg	0.0000289 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.38 mg/kg		0.296 mg/kg	0.0000296 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.49 mg/kg		0.382 mg/kg	0.0000382 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.2 mg/kg		0.156 mg/kg	0.0000156 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.41 mg/kg		0.32 mg/kg	0.000032 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.19 mg/kg		0.148 mg/kg	0.0000148 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		0.23 mg/kg		0.179 mg/kg	0.0000179 %	✓	
Total:								0.0243 %		

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 Determinand - 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: TP103

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

Sample details

Sample name:	LoW Code:
TP103	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.00-0.20 m	
Moisture content:	
17%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	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							
1	pH		PH		6.1 pH		6.1 pH	6.1 pH		
2	arsenic { arsenic trioxide }				16 mg/kg	1.32	17.534 mg/kg	0.00175 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				16 mg/kg	1.462	19.409 mg/kg	0.00194 %	✓	
		215-160-9	1308-38-9							
6	copper { dicopper oxide; copper (I) oxide }				56 mg/kg	1.126	52.331 mg/kg	0.00523 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	100 mg/kg		83 mg/kg	0.0083 %	✓	
	082-001-00-6									
8	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							
9	nickel { nickel dihydroxide }				16 mg/kg	1.579	20.976 mg/kg	0.0021 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
10	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									
11	zinc { zinc oxide }				110 mg/kg	1.245	113.642 mg/kg	0.0114 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
12	naphthalene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
14	acenaphthene				0.07 mg/kg		0.0581 mg/kg	0.00000581 %	✓	
		201-469-6	83-32-9							



#	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							
15	fluorene	201-695-5	86-73-7		0.05 mg/kg		0.0415 mg/kg	0.00000415 %	✓	
16	phenanthrene	201-581-5	85-01-8		0.5 mg/kg		0.415 mg/kg	0.0000415 %	✓	
17	anthracene	204-371-1	120-12-7		0.1 mg/kg		0.083 mg/kg	0.0000083 %	✓	
18	fluoranthene	205-912-4	206-44-0		0.97 mg/kg		0.805 mg/kg	0.0000805 %	✓	
19	pyrene	204-927-3	129-00-0		0.92 mg/kg		0.764 mg/kg	0.0000764 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		0.46 mg/kg		0.382 mg/kg	0.0000382 %	✓	
21	chrysene	601-048-00-0	205-923-4		0.59 mg/kg		0.49 mg/kg	0.000049 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		0.68 mg/kg		0.564 mg/kg	0.0000564 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.3 mg/kg		0.249 mg/kg	0.0000249 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		0.52 mg/kg		0.432 mg/kg	0.0000432 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.27 mg/kg		0.224 mg/kg	0.0000224 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
27	benzo[ghi]perylene	205-883-8	191-24-2		0.32 mg/kg		0.266 mg/kg	0.0000266 %	✓	
Total:								0.0316 %		

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 Determinand - 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: TP106

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

Sample details

Sample name:	LoW Code:
TP106	Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)
040-1.25 m	
Moisture content:	
11%	
(wet weight correction)	

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	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							
1	pH		PH		7.7 pH		7.7 pH	7.7 pH		
2	arsenic { arsenic trioxide }				27 mg/kg	1.32	31.727 mg/kg	0.00317 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				35 mg/kg	1.462	45.527 mg/kg	0.00455 %	✓	
		215-160-9	1308-38-9							
6	copper { dicopper oxide; copper (I) oxide }				190 mg/kg	1.126	190.388 mg/kg	0.019 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	120 mg/kg		106.8 mg/kg	0.0107 %	✓	
	082-001-00-6									
8	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							
9	nickel { nickel dihydroxide }				38 mg/kg	1.579	53.419 mg/kg	0.00534 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
10	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									
11	zinc { zinc oxide }				83 mg/kg	1.245	91.947 mg/kg	0.00919 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
12	naphthalene				1 mg/kg		0.89 mg/kg	0.000089 %	✓	
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				0.08 mg/kg		0.0712 mg/kg	0.00000712 %	✓	
		205-917-1	208-96-8							
14	acenaphthene				1.6 mg/kg		1.424 mg/kg	0.000142 %	✓	
		201-469-6	83-32-9							



#	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							
15	fluorene	201-695-5	86-73-7		1.4 mg/kg		1.246 mg/kg	0.000125 %	✓	
16	phenanthrene	201-581-5	85-01-8		11 mg/kg		9.79 mg/kg	0.000979 %	✓	
17	anthracene	204-371-1	120-12-7		3 mg/kg		2.67 mg/kg	0.000267 %	✓	
18	fluoranthene	205-912-4	206-44-0		13 mg/kg		11.57 mg/kg	0.00116 %	✓	
19	pyrene	204-927-3	129-00-0		12 mg/kg		10.68 mg/kg	0.00107 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		6.1 mg/kg		5.429 mg/kg	0.000543 %	✓	
21	chrysene	601-048-00-0	205-923-4		5.7 mg/kg		5.073 mg/kg	0.000507 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		6.9 mg/kg		6.141 mg/kg	0.000614 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		2.4 mg/kg		2.136 mg/kg	0.000214 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		5.7 mg/kg		5.073 mg/kg	0.000507 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		2.5 mg/kg		2.225 mg/kg	0.000223 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.65 mg/kg		0.579 mg/kg	0.0000579 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		2.8 mg/kg		2.492 mg/kg	0.000249 %	✓	
28	TPH (C6 to C40) petroleum group		TPH		109.6 mg/kg		97.544 mg/kg	0.00975 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
Total:								0.0689 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00975%)



Classification of sample: TP108

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

Sample details

Sample name:	LoW Code:	
TP108	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.10-1.00 m		
Moisture content:		
15%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	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							
1	pH		PH		7.1 pH		7.1 pH	7.1 pH		
2	arsenic { arsenic trioxide }				43 mg/kg	1.32	48.258 mg/kg	0.00483 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	22.362 mg/kg	0.00224 %	✓	
		215-160-9	1308-38-9							
6	copper { dicopper oxide; copper (I) oxide }				380 mg/kg	1.126	363.662 mg/kg	0.0364 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	140 mg/kg		119 mg/kg	0.0119 %	✓	
	082-001-00-6									
8	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							
9	nickel { nickel dihydroxide }				67 mg/kg	1.579	89.953 mg/kg	0.009 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
10	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									
11	zinc { zinc oxide }				140 mg/kg	1.245	148.121 mg/kg	0.0148 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
12	naphthalene				0.32 mg/kg		0.272 mg/kg	0.0000272 %	✓	
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
14	acenaphthene				0.21 mg/kg		0.179 mg/kg	0.0000179 %	✓	
		201-469-6	83-32-9							



#	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							
15	fluorene	201-695-5	86-73-7		0.17 mg/kg		0.145 mg/kg	0.0000145 %	✓	
16	phenanthrene	201-581-5	85-01-8		2 mg/kg		1.7 mg/kg	0.00017 %	✓	
17	anthracene	204-371-1	120-12-7		0.37 mg/kg		0.315 mg/kg	0.0000314 %	✓	
18	fluoranthene	205-912-4	206-44-0		3 mg/kg		2.55 mg/kg	0.000255 %	✓	
19	pyrene	204-927-3	129-00-0		2.7 mg/kg		2.295 mg/kg	0.00023 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		1.4 mg/kg		1.19 mg/kg	0.000119 %	✓	
21	chrysene	601-048-00-0	205-923-4		1.4 mg/kg		1.19 mg/kg	0.000119 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		1.6 mg/kg		1.36 mg/kg	0.000136 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		0.78 mg/kg		0.663 mg/kg	0.0000663 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		1.5 mg/kg		1.275 mg/kg	0.000127 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		0.64 mg/kg		0.544 mg/kg	0.0000544 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.21 mg/kg		0.179 mg/kg	0.0000179 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		0.76 mg/kg		0.646 mg/kg	0.0000646 %	✓	
28	TPH (C6 to C40) petroleum group		TPH		43 mg/kg		36.55 mg/kg	0.00366 %	✓	
29	benzene	601-020-00-8	200-753-7		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
30	toluene	601-021-00-3	203-625-9		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
31	ethylbenzene	601-023-00-4	202-849-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
32	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
Total:								0.0847 %		

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 Determinand - 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 because Concentration too low to be considered flammable. Low concentrations of short chain hydrocarbons. Discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00366%)



Classification of sample: HP101

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

Sample details

Sample name:	LoW Code:	
HP101	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.30-1.10 m		
Moisture content:		
17%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	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							
1	pH		PH		7.2 pH		7.2 pH	7.2 pH		
2	arsenic { arsenic trioxide }				43 mg/kg	1.32	47.122 mg/kg	0.00471 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
3	cadmium { cadmium sulfide }			1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
	048-010-00-4	215-147-8	1306-23-6							
4	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	20.623 mg/kg	0.00206 %	✓	
		215-160-9	1308-38-9							
6	copper { dicopper oxide; copper (I) oxide }				530 mg/kg	1.126	495.278 mg/kg	0.0495 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	130 mg/kg		107.9 mg/kg	0.0108 %	✓	
	082-001-00-6									
8	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							
9	nickel { nickel dihydroxide }				64 mg/kg	1.579	83.903 mg/kg	0.00839 %	✓	
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]							
10	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									
11	zinc { zinc oxide }				270 mg/kg	1.245	278.94 mg/kg	0.0279 %	✓	
	030-013-00-7	215-222-5	1314-13-2							
12	naphthalene				2.6 mg/kg		2.158 mg/kg	0.000216 %	✓	
	601-052-00-2	202-049-5	91-20-3							
13	acenaphthylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-917-1	208-96-8							
14	acenaphthene				0.57 mg/kg		0.473 mg/kg	0.0000473 %	✓	
		201-469-6	83-32-9							



#	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							
15	fluorene	201-695-5	86-73-7		0.53 mg/kg		0.44 mg/kg	0.000044 %	✓	
16	phenanthrene	201-581-5	85-01-8		6 mg/kg		4.98 mg/kg	0.000498 %	✓	
17	anthracene	204-371-1	120-12-7		1.1 mg/kg		0.913 mg/kg	0.0000913 %	✓	
18	fluoranthene	205-912-4	206-44-0		7.3 mg/kg		6.059 mg/kg	0.000606 %	✓	
19	pyrene	204-927-3	129-00-0		6.6 mg/kg		5.478 mg/kg	0.000548 %	✓	
20	benzo[a]anthracene	601-033-00-9	200-280-6		3.1 mg/kg		2.573 mg/kg	0.000257 %	✓	
21	chrysene	601-048-00-0	205-923-4		3.1 mg/kg		2.573 mg/kg	0.000257 %	✓	
22	benzo[b]fluoranthene	601-034-00-4	205-911-9		3.8 mg/kg		3.154 mg/kg	0.000315 %	✓	
23	benzo[k]fluoranthene	601-036-00-5	205-916-6		1 mg/kg		0.83 mg/kg	0.000083 %	✓	
24	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5		3.1 mg/kg		2.573 mg/kg	0.000257 %	✓	
25	indeno[123-cd]pyrene	205-893-2	193-39-5		1.3 mg/kg		1.079 mg/kg	0.000108 %	✓	
26	dibenz[a,h]anthracene	601-041-00-2	200-181-8		0.33 mg/kg		0.274 mg/kg	0.0000274 %	✓	
27	benzo[ghi]perylene	205-883-8	191-24-2		1.6 mg/kg		1.328 mg/kg	0.000133 %	✓	
Total:								0.107 %		

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 Determinand - 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

Appendix A: Classifier defined and non GB MCL determinands

• pH (CAS Number: PH)

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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

• 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

▪ **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

▪ **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

▪ **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

▪ **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

cadmium {cadmium sulfide}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

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

Absence of hexavalent chromium indicates it unlikely that lead chromate is present within the site soils. Given the presence of groundwater underlying the site at shallow depths an insoluble form has been selected.

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}

Absence of hexavalent chromium indicates it unlikely that zinc chromate is present within the site soils. Given the presence of groundwater underlying the site at shallow depths an insoluble form has been selected (zinc oxide).

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.2.GB - Oct 2021**

HazWasteOnline Classification Engine Version: 2023.237.5731.10565 (25 Aug 2023)

HazWasteOnline Database: 2023.237.5731.10565 (25 Aug 2023)



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

APPENDIX G

BGS Radon Report

STEPHANIE DIXON
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WITTON STREET
NORTHWICH
CW9 5LP

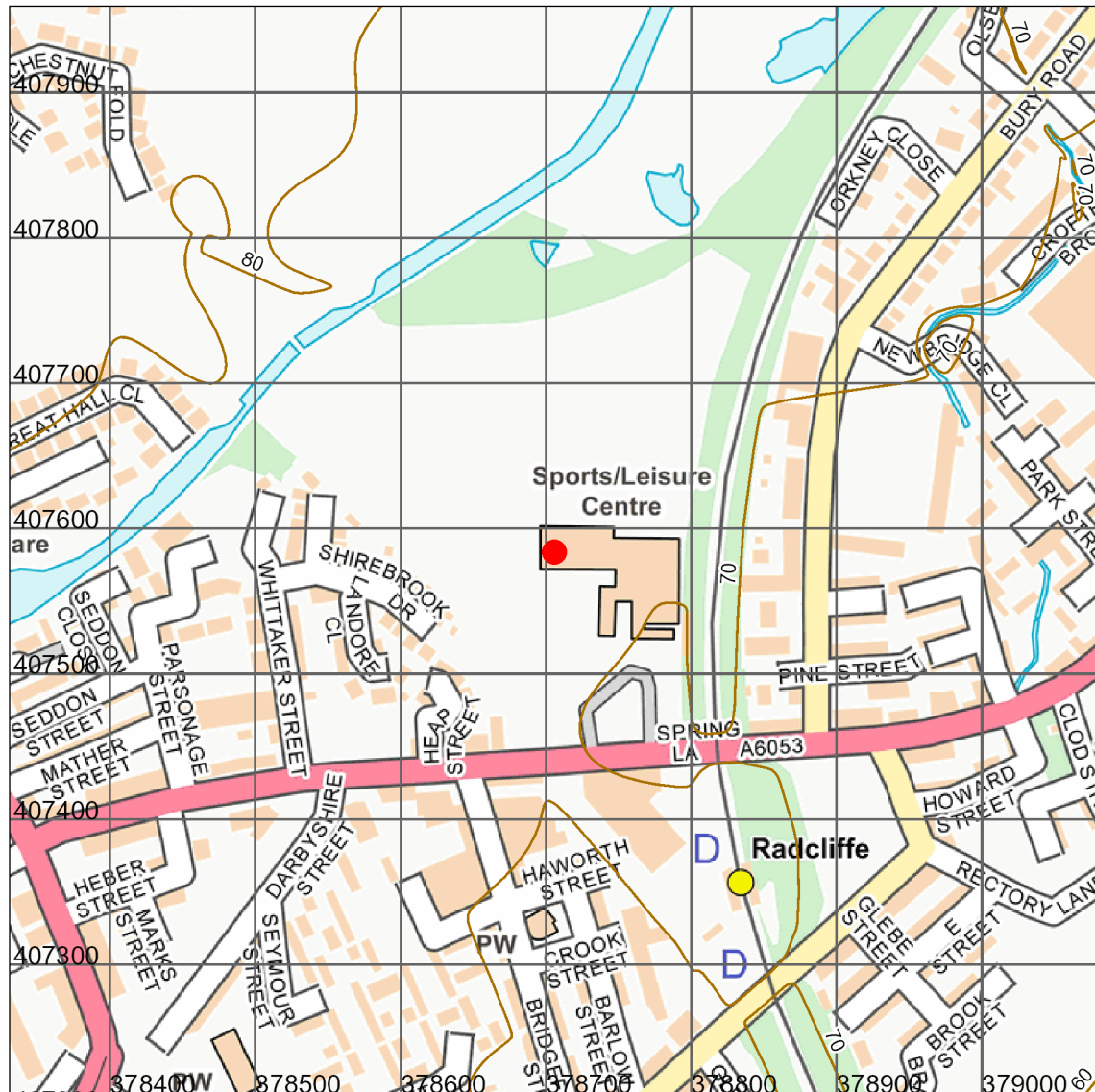
Radon Report

Advisory report on the requirement for radon protective measures in new buildings, conversions and extensions to existing buildings. The report also indicates whether a site is located within a radon Affected Area

Report Id: *BGS_335200/49095*

Client reference: C5394/SD

Search location



Contains OS data © Crown Copyright and database right 2023. OS OpenMap Local: Scale: 1:5 000 (1cm = 50 m)

Search location indicated in red

Site Address:

SPRING LANE SCHOOL
SPRING LANE
RADCLIFFE
MANCHESTER
M26 2SZ

Point centred at: grid reference obtained from Ordnance Survey OS Places API

Radon Report: UK

When extensions are made to existing buildings in high radon areas, or new buildings are constructed in these areas, the Building Regulations for England, Wales, Scotland and Northern Ireland require that protective measures are taken against radon entering the building.

This report provides information on whether radon protective measures are required. Depending on the probability of buildings having high radon levels, the Regulations may require either:

1. No protective measures
2. Basic protective measures
3. Full protective measures

This is an advisory report on the requirement for radon protective measures in new buildings, conversions and extensions. The report also indicates whether a site is located within a radon Affected Area

Requirement for radon protective measures

The determination below follows advice in *BR211 Radon: Guidance on protective measures for new buildings (2023 edition)*, which also provides guidance on what to do if the result indicates that protective measures are required.

Is the property in an area where radon protective measures are required for new buildings or extensions to existing ones as described in publication BR211 (2023 edition) Radon: Guidance on protective measures for new buildings?

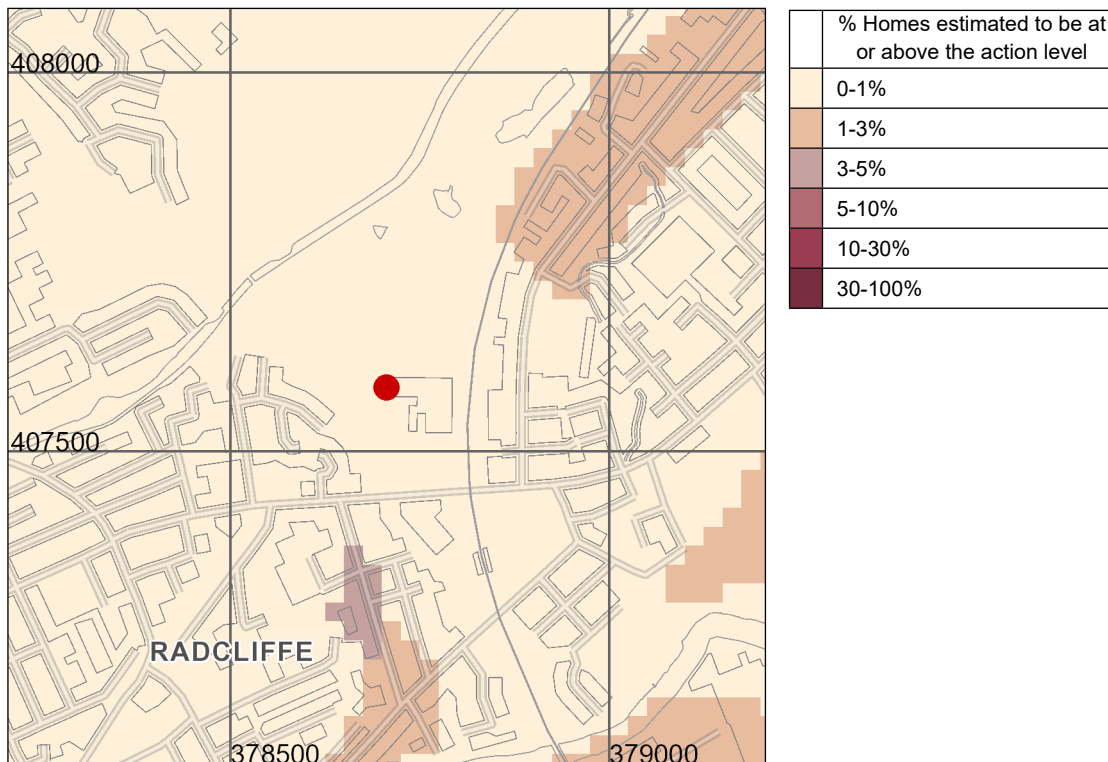
NO RADON PROTECTIVE MEASURES ARE REQUIRED FOR THE REPORT AREA.

More details of the protective measures required are available in *BR211 Radon: Guidance on protective measures for new buildings (2023 Edition)*. Additional information and guidance is available from the Building Research Establishment website (<http://www.bre.co.uk/radon/>).

Whether or not the radon level in a building is above or below the radon Action Level can only be established by having the building tested. The UKHSA provides a radon testing service which can be accessed at www.ukradon.org or by telephone (01235 822622).

If you require further information or guidance, you should contact your local authority building control officer or approved inspector.

Radon Affected Area



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Scale: 1:10 000 (1cm = 100 m)

Search area indicated in red

Is the property in a radon Affected Area as defined by the UK Health Security Agency (UKHSA) and if so what percentage of homes are estimated to be at or above the Action Level? NO

Additional Information

THE PROPERTY IS IN AN AREA WHERE LESS THAN 1% OF HOMES ARE ESTIMATED TO BE AT OR ABOVE THE ACTION LEVEL. THE PROPERTY IS NOT IN A RADON AFFECTED AREA.

The UKHSA recommends a radon 'Action Level' of 200 Becquerels per cubic metre of air (Bq m^{-3}) for the annual average of the radon gas concentration in a home. Where 1% or more of homes are estimated to be at or above the Action Level the area should be regarded as a radon Affected Area.

This report informs you whether the property is in a radon Affected Area and the percentage of homes that are estimated to be at or above the radon Action Level at this location. Being in an Affected Area does not necessarily mean there is a high radon level within the property; the only way to determine the radon level is to carry out a radon measurement.

The UKHSA advises that radon gas should be measured in all properties within radon Affected Areas and that homes with radon levels at or above the Action Level (200 Bq m⁻³) should be remediated. Householders with levels between the Target Level (100 Bq m⁻³) and Action Level should seriously consider reducing their radon level, especially if they are at greater risk, such as if they are current or ex smokers. Whether or not a home is in fact above or below the Action Level or Target Level can only be established by having the building tested. The UKHSA provides a validated radon testing service which can be accessed at www.ukradon.org.

The information in this report provides an answer to one of the standard legal enquiries on house purchase in England and Wales, known as Law Society CON29 Enquiries of the Local Authority (2016); 3.14 Radon Gas: Do records indicate that the property is in a “Radon Affected Area” as identified by the UKHSA. The data can also be used to advise house buyers and sellers in Scotland and Northern Ireland.

If you are buying a new build property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

If you are buying a currently occupied property in a radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were at or above the radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and if the results of re-testing confirmed the effectiveness of the measures.

Further information on radon is available from the UKHSA at www.ukradon.org.

What is radon?

Radon is a naturally occurring radioactive gas, which is produced by the radioactive decay of radium which, in turn, is derived from the radioactive decay of uranium. Uranium is found in small quantities in all soils and rocks, although the amount varies from place to place. Radon released from rocks and soils is quickly diluted in the atmosphere. Concentrations in the open air are normally very low and do not present a hazard. Radon that enters enclosed spaces such as some buildings (particularly basements), caves, mines, and tunnels may reach high concentrations in some circumstances. The construction method and degree of ventilation will influence radon levels in individual buildings. A person's exposure to radon will also vary according to how particular buildings and spaces are used.

Inhalation of the radioactive decay products of radon gas increases the chance of developing lung cancer. If individuals are exposed to high concentrations for significant periods of time, there may be cause for concern. In order to limit the risk to individuals, the Government has adopted an Action Level for radon in homes of 200 becquerels per cubic metre (Bq m^{-3}). The Government advises householders that, where the radon level is at or above the Action Level, measures should be taken to reduce the concentration.

Radon in workplaces

The Ionising Radiation Regulations 2017 require employers to take action when radon is present above a defined level in the workplace. Advice may be obtained from your local Health and Safety Executive Area Office or the Environmental Health Department of your local authority. The BRE publishes a guide (BR293): **Radon in the workplace**. BRE publications may be obtained from the BRE Bookshop, Tel: 01923 664262, email: bookshop@bre.co.uk website: www.brebookshop.com

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