GROUND INVESTIGATION REPORT FOR PLOT 2, FIVE FORDS, MARCHWIEL, WREXHAM

TE1890-TE-00-XX-RP-GE-001-V02

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FINAL

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EXECUTIVE SUMMARY

Introduction	Tier Environmental was commissioned by Net World Sports Ltd to undertake a Ground Investigation of Plot 2, Marchwiel. The purpose of the investigation was to determine the nature and extent of soil and groundwater beneath the site for the purposes of environmental and geotechnical assessment.
Proposed land use	It is proposed that the site will be developed as a number of commercial/industrial units with associated yards, access roads, soft landscaping areas and infrastructure.
Site location and surrounding land uses	The site is located at located at Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales, LL13 0SQ and currently comprises an agricultural field. The site is set within a mixed industrial, commercial and agricultural area. A number of industrial units which are part of Wrexham Industrial Estate are located from circa 220m to the northeast of the site. Businesses in the industrial estate include a recycling centre and a Truck & Bus Services (repair shop). To the west of the site is the Five Fords Wastewater Treatment facility with infrastructure including filter beds, sludge beds above ground storage tanks.
Site history	Historically, the site has been a farm and has remained in agricultural use since at least the 1870s with a number of drainage channels and ponds located on-site. From the early-1900s to the 1960s the site was labelled as a Sewage Farm, and it is understood the site acted as an outfall for sewage from the adjacent Five Fords Wastewater Treatment Facility. The surrounding area is predominately characterised by agricultural land; however, a number of commercial and industrial units are located to the north-east of the site associated with Wrexham Industrial Estate and to the west of the site associated with Five Fords Wastewater Treatment Facility. Potentially contaminative uses within the surrounding area have included the railway adjacent to the south of the site (c. 1890s to 1970s) and mineral railway 200m northeast (c. 1940s to 1970s), which served Wrexham Industrial Estate located up to 250m northeast of the site, as well as the Five Fords Wastewater Treatment Facility 50m west of the site (c. early-1900s to present).
Potential contaminative features	Potential pollutants associated with the historical on-site uses are limited to the potential for the presence of localised Made Ground associated with the infill of the drainage ditches/ponds and potential sources of ground gas associated with the infill and the use of the site relating to the Sewage Farm. Potential pollutants associated with the surrounding land use include chemicals, oils, heavy metals and organic contaminants.
Mining and quarrying	The site is not considered to be at risk from historic shallow mining. Historical plans do not indicate any quarries, clay pits or other extractive industries in the vicinity of the site. Localised workings of shallow strata cannot be wholly discounted but given the historical use of the site this is considered unlikely.
Previous investigations	A third party desk study report was conducted by Hilson Moran, titled 'Phase 1 Contaminated Land Assessment' (Report reference: 34367-HML-XX-XX-RP-U-830001, November 2024).
Fieldwork	The ground investigation was conducted between 2nd and 18th December 2024 and was supervised by suitably qualified Tier Environmental engineers. The investigation comprised 17 No. trial pits, 25 No. window sample boreholes and 18 No. cable percussion boreholes.
Laboratory testing	Samples of soil, soil leachate and groundwater were submitted for analysis of a range of metal, other inorganic and organic components, including asbestos. Geotechnical testing was scheduled on selected samples. All testing was undertaken at accredited laboratories.
Ground conditions	Topsoil was encountered at all intrusive investigation locations to between 0.25m and 0.50m bgl. Made Ground was locally encountered within TP17 and TP18 to depths typically between 0.30m and 1.55m bgl comprising both cohesive and granular materials with anthropogenic including plastic, brick, ceramic and tile. Made Ground corresponds to historically infilled ponds. Cohesive and locally granular superficial Glacial Till deposits were encountered across the site to the maximum drilled depth of 10.45m bgl. It should also be noted that organic peat soils were recorded from 1.50-2.10m and 2.50-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays (historic pond locations). These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation. Groundwater levels were recorded between 1.20m and 7.00m bgl during fieldworks. In several locations the level was noted to increase either slightly or significantly, in some cases to near or at ground level such as CP01, CP05, TP01, TP02, TP04 and WS17. This generally indicated sub-artesian conditions across site. Whilst groundwater was not recorded to overflow above ground level, possible artesian conditions could be created following regrading works and/or ground improvement works (such as the installation of vibro stone columns) and this should be considered within the earthworks and drainage design. Groundwater levels during monitoring were recorded generally within 2m of ground level, locally at circa 3.0m bgl in CP03 indicating a general shallow groundwater level across the entire site within the Till.

Ground stability	It should also be noted that organic peat soils were recorded from 1.50-2.10m and 2.50-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays. These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation due to access restrictions (standing surface water).
Foundations and floor slabs	Given the encountered ground conditions, with localised soft (<40kPa) clay soils in a number of locations between 1.2m-6m bgl, and variable loose granular soils, and taking in account the nature of the proposed development and initial discussions with specialist contractors, the most economic foundation solution is likely to be ground improvement, such as rigid inclusions/CMCs and/or vibro stone columns supporting pad foundations. This would be adopted for the entire structure, dependent upon the design requirements and economic feasibility. Preliminary discussions with a specialist contractor suggest vibro stone columns could be utilised beneath the foundations and slabs dependant on the required loads for a bearing capacity of 150kPa. If higher loadings on the slabs are proposed it may be required to utilise Controlled Modulus Columns to reduce settlements in the deeper layers where there is some soft to firm material shown in the Till. It has been recommended that CMCs could provide a bearing capacity of 200kPa. Loadings will require evaluating once proposed earthworks, including up to 4m of fill locally, have been finalised. Different foundation methods should be considered for each unit taking into account regrading works, ground conditions and loadings. Consideration will need to be given to the sub-artesian groundwater conditions encountered across site, and the proposed cut of up to 2m - 3m within the southern area of the site which may result in artesian groundwater conditions. Artesian groundwater issues may need to be accounted for in the surface water drainage system for the development.
Sulphate class	It is considered that a Design Sulphate Class of DS-1 and ACEC Class AC-1s is appropriate for buried concrete at the site.
Phosphorus	The site falls within a Phosphorus Sensitive SAC Freshwater catchment area associated with the River Dee. As such, due consideration during drainage strategy / design should be given with respect to this designation and any mitigation / avoidance measures.
Contamination – human health	No measured soil concentrations of potential contaminants of concern have been reported in excess of Generic Assessment Criteria (GACs) protective of human health appropriate to the proposed land use. Of the 22 No. topsoil and 2 No. Made Ground samples submitted for asbestos screening, 2 No. were reported to contain asbestos in WS04 and WS24 in the southwest and northwest respectively, in the form of chrysotile fibre bundles at <0.001% w/w.
Contamination – controlled waters	It is assumed that any field drainage from the site and surface water drains towards The River Clywedog that is located circa 60m north of the site. Superficial deposits (Glacial Till) are classified as a Secondary Undifferentiated Aquifer and the bedrock (Salop Formation) is classified as a Secondary A. The site is not located within an area covered by a Source Protection Zone and no active potable/ non-potable water abstractions are present in the site's vicinity. The site is set within an area of significant wider historical commercial/industrial heritage and at least 10m of predominantly cohesive Till. On this basis the controlled waters sensitivity for the Secondary A/Principal Aquifer is regarded as being low. The conclusion of an assessment carried out on groundwater results has determined that the site does not present a significant risk to the controlled water environment.
Gas protection	A Gas Screening Value of 0.0224 l/hr has been calculated, derived using the maximum peak recorded carbon dioxide concentration of 5.6 %v/v and the maximum steady flow rate of 0.4 l/hr. Assessment of this gas screening value alone places the site in a Characteristic Situation 1 – Very Low Risk scenario in accordance with CIRIA C665 for which ground gas protection measures are not required. The results of carbon monoxide and hydrogen sulphide monitoring has determined elevated carbon monoxide levels though due to an absence of potential on site sources, sub artesian groundwater conditions, and widespread groundwater pumping across site wells, these levels are not considered to pose a risk. It is also anticipated that the organic soils within the historic ponds will be removed and replaced with suitable fill during the enabling works.
Radon requirements	The site lies within an area where between worst 5% and 10% of properties are above the Action Level within the north of the site, with the southwest in a 3-5% area and southeast in a <1% area. On this basis, basic radon protection measures are required, likely in the form of a suitable DPM which will act as a radon gas barrier. A site specific radon assessment may re-evaluate the risk rating. In addition to the above, basements represent areas that are more at risk because the walls are in contact with the ground as well as the floor. This, coupled with reduced natural ventilation below ground level, increases the risk of elevated radon levels. All basements are therefore considered under BR 211 to be at increased risk of elevated levels of radon regardless of geographic location. Currently, no basements or converted cellars / basements are proposed for the development and therefore no additional consideration of potential increased risk needs to be made; however, this should be revisited in the event that the proposals change to include for a basement.

Other issues	• A sewer main cuts northwest/southeast through the south of the site. • Further sewers run parallel along the northern site boundary.
Waste soils classification	Basic waste characterisation has determined that Made Ground soils are non-hazardous with the following exceptions: • Peat soils in TP17 at 1.60m bgl, and organic clay soils in TP18 at 2.80m bgl are both considered hazardous due to elevated TPH compounds. WAC testing has not been completed as part of this investigation. It is anticipated that the majority of non-organic natural soils will be suitable for disposal to an inert landfill.
Materials re-use	Subject to volumetric cut and fill requirements the majority of Made Ground materials and the majority of natural soil materials and may be considered chemically suitable for potential re-use subject to careful management and placement of materials and in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). Suitability for re-use would also be subject to confirmation of the geotechnical suitability depending on whether the materials are to be re-used in load bearing areas. This would need to be detailed in a supporting document. Please note that any previously landfilled or mining waste materials may not be appropriately subject to consideration under DoWCoP and may not be re-used under DoWCoP unless sufficient lines of evidence and agreement with the local Environment Agency Waste Team can be sought beforehand. In addition, Section 11.3 of this report includes statements with respect to re-use of excavated and stockpiled clean naturally occurring soils within the site and re-use on other sites. These statements are designed to provide a clear intention to reuse any clean, naturally occurring soils derived from future excavations at this site (which may also include temporary future stockpiling these materials).
Outline remediation strategy & further works	• Detailed Quantitative Risk Assessment to confirm the suitably for reuse of the asbestos containing Topsoil locally identified in the northwest and southwest of the site. • Confirmation of the route of the sewer that traverses the southern area of the site (Tier is currently liaising with Welsh Water to agree methodology). • Installation of basic radon protection measures. • Decommissioning of monitoring wells with bentonite cement grout to remove preferential pathways for artesian and sub-artesian groundwater to affect the proposed enabling works and development. • Bench trials to confirm the suitability of modifying and stabilising site won fill with lime/cement. • Bench trials to confirm the suitability of modifying and stabilising site won fill with lime/cement. • Materials Management Plan or U1 Exemption for the reuse on any site won Made Ground. • Confirmation that WRAP Protocol has been followed for all imported recycled aggregates.

1. INTRODUCTION

Tier Environmental was commissioned by Net World Sports Ltd to undertake a Land Contamination Risk Management (LCRM) Ground Investigation for an area of land referred to as Plot 2, Marchwiel located at Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales, LL13 0SQ (the "site").

The title of this report is in accordance with that described in the Land Contamination Risk Management guidance (available at https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm) which has superseded CLR 11:

Stage 1:

- LCRM Tier 1 Preliminary Risk Assessment Report
- LCRM Tier 2 Generic Quantitative Risk Assessment Report

1.1. Proposed Development

Under current proposals the development will comprise a number of single storey commercial/industrial units with associated yards, access roads, soft landscaping areas and infrastructure, as presented in Appendix A. As such, in accordance with the *'Updated technical background to the CLEA model'* (Environment Agency, 2009) and *'Suitable 4 Use Levels'* (LQM / CIEH 2015) the proposed generic land use for this development is commercial/industrial.

1.2. Previous Reports

The following third party report was made available:

- Hilson Moran 'Phase 1 Contaminated Land Assessment' (Report reference: 34367-HML-XX-XX-RP-U-830001, November 2024).

1.3. Objectives

Taking into account the proposed development of the site, the objectives of this appraisal were:

- To review previous pertinent third party reports.
- To determine current ground and groundwater conditions.
- To determine the potential risks to human health and the wider environment.
- To provide a preliminary waste soils classification.
- To determine potential risks posed to the site from hazardous ground gases and / or vapours.
- Provide preliminary outline remedial measures to manage any identified risks.
- To provide preliminary geotechnical parameters to inform floor slab and foundation recommendations.

1.4. Assumptions

The following assumptions are made in this report:

- It is assumed that ground levels will not change significantly from those described in this report or a shown on proposed development drawings. If this is not the case, then amendments to the recommendations made in this report may be required.
- The ground investigation has been designed with due consideration of known or suspected constraints (including underground services and access constraints).
- Any references to observations of suspected asbestos-containing materials are for information only and should be verified by a suitably qualified asbestos specialist and/or confirmed by laboratory analysis.
- The use of the term 'Topsoil' within this report is based on a visual identification only and that these materials have not been classified in accordance with BS3882:2015.
- The use of the terms ‘shallow’ and ‘deep’ within this report (from a geotechnical perspective) assume *typically* between ground level to circa 3.00m below ground level (bgl) for ‘shallow’ and greater than 3.00m bgl regarded as ‘deep’.
- The comments and opinions presented in this report are based on review of third-party information and ground conditions encountered during intrusive investigation works performed by Tier Environmental and the results of tests carried out within one or more laboratories. There may be other conditions prevailing on the site which have not been revealed by this investigation and which have not been taken into account by this report.
- Responsibility cannot be accepted for any conditions not revealed by this investigation. Any diagram or opinion on the possible configuration of the findings is conjectural and given for guidance only. Confirmation of intermediate ground conditions should be undertaken if deemed necessary.

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2. SITE DETAILS AND DESCRIPTION

Table 2.1 Current Site Overview.

Site name	Plot 2, Marchwiel
Site address	Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales, LL13 0SQ. A site location plan is included as Drawing No. TE1890-TE-00-XX-DR-GE-001-V01 within Appendix A.
National Grid Reference (NGR)	SJ 336961 347983
Approximate site area	24.17 hectares
Site shape	Elongate, approximately rectangular.
Current land use on the site	The site currently comprises an agricultural field, bordered by hedge rows and trees along the eastern site boundaries and fence lines along the northern and western site boundaries. The site is bound to the south by an approximately 3-5 m vegetated bund that runs the expanse of the southern site boundary. Access to the site is via two gates off Sesswick Way to the east or via an access track of Cefn Road to the north of the site. Three main services are reported to be present on or in the immediate vicinity of the site; 2 No. pressurised waste mains along the northern boundary and a 1,200mm foul gravity sewer running NW to SE across the centre of the site (Service plans presented in Appendix A) from the Five Fords Wastewater Treatment Works to the River Dee.
Surrounding land uses	The site is set within a mixed industrial, commercial and agricultural area. The site is bound by Sesswick Way to the east of the site, beyond which are further agricultural fields. A number of industrial units which are part of Wrexham Industrial Estate. Businesses in the industrial estate include a recycling centre and a Truck & Bus Services (repair shop). Adjacent to the west of the site is a public bridleway and agricultural fields. Beyond the agricultural fields is the Five Fords Wastewater Treatment Works with infrastructure including filter beds, sludge beds, above ground storage tanks (ASTs) and solar panels. Further agricultural fields are present adjacent to the north of the site, beyond which is the River Clywedog (60m) and Cefn Road. The south of the site is bound by a vegetated embankment, beyond which are agricultural fields. In the south-east of the site is a wooded area with a number of ponds.
General topography and ground levels	In terms of topography, the site ranges from around 34 to 46 m AOD.

An aerial photograph with the site boundary in orange is shown below. Relevant site photographs are presented in Appendix G.

Figure 2.1 Recent Aerial Photograph



3. PREVIOUS INVESTIGATION FINDINGS

A third party desk study report was conducted by Hilson Moran, titled 'Phase 1 Contaminated Land Assessment' (Report reference: 34367-HML-XX-XX-RP-U-830001, November 2024). The report is summarised in Table 3.1 below.

Table 3.1 Report Review Summary

Site history	Hilson Moran completed a review of historic maps for the site and determined the following: *Historically, the farm has remained in agricultural use since at least the 1870s with a number of drainage channels and ponds located on-site. From the early-1900s to the 1960s the site was labelled as a Sewage Farm, and it is understood the site acted as an outfall for sewage from the adjacent Five Fords Wastewater Treatment Facility. Hilson Moran therefore determined potential pollutants associated with the historical on-site uses are limited to the potential for the presence of Made Ground associated with the infill of the drainage ditches/ponds and potential sources of ground gas associated with the infill and the use of the site relating to the Sewage Farm.* *The surrounding area is predominately characterised by agricultural land; however, a number of commercial and industrial units are located to the north-east of the site associated with Wrexham Industrial Estate and to the west of the site associated with Five Fords Wastewater Treatment Facility. Potentially contaminative uses within the surrounding area have included the railway adjacent to the south of the site (c. 1890s to 1970s) and mineral railway 200 m north-east (c. 1940s to 1970s), which served Wrexham Industrial Estate located up to 250 m north-east of the site, as well as the Five Fords Wastewater Treatment Facility up to 50 m west of the site (c. early-1900s to present). Potential pollutants associated with the surrounding land use include chemicals, oils, heavy metals and organic contaminants.*
UXO Risk Assesment	A Preliminary Desk Study Assessment for unexploded ordnance (UXO) was obtained for the site from Zetica. The assessment did not identify any significant military activity affecting the site or any records indicating that the site was bombed. As such, a detailed desk study was not considered essential. Given this, the site was awarded a Low UXO and explosives contamination hazard level.
Mining and quarrying	The site is located within a Coal Mining Affected Area. The Coal Mining Report reviewed by Hilson Moran identified no specific issues. As such, it was considered unlikely that a Coal Mining Risk Assessment will be required as part of the planning process, providing no issues are identified during the ground investigation.
Other Worked and Infilled Land	According to the Groundsure report, the site and immediately surrounding area is not part of a permitted or historical landfill site but there are numerous areas of surface ground workings, potentially artificial or Made Ground identified within 250m of the site. These mostly relate to areas of surface water (ponds) identified from historical maps which may have potentially been infilled with three entries relating to the sewage farm historically present on the site. A number of entries also relate to cuttings adjacent to the south of the site in the location of the historic railway.
Hydrology & Hydrogeology	Hilson Moran determined the site is considered likely to be underlain by a significant thickness of low permeability Till (Secondary Undifferentiated Aquifer) which overlies bedrock of the Salop Formation comprising Mudstone, Sandstone and Conglomerate (Secondary A Aquifer). As such, the overlying low permeability Till deposits can be expected to afford protection against the vertical migration of contaminants into the deeper Secondary A aquifer. The site is not within a source protection zone and there are no potable groundwater abstractions within 2km of the site, though there is a non-potable (heat pump) located 450m southeast. The nearest surface water feature is located approximately 20 m north-east of the site, relating to a drainage channel which is considered likely to flow into the River Clywedog located 60 m north of the site.
Environmental setting	The environmental site setting is considered to be of low to moderate sensitivity. There are no ecologically designated sites or priority habitat within 1 km of the proposed development site.
Preliminary Conceptual Site Model	Hilson Moran produced an assessment of potential pollutant linkages for both on and off-site source. The conclusion of this assessment determined a moderate to low risk for future site users, construction workers and adjacent land users for Made Ground associated with historic land uses including the sewage farm, and a moderate to low risk for controlled waters. Ground gas risk was considered to be moderate driven by the potential for infilled ponds and suspected distribution of sewage sludge across site.

Radon Requirements	Hilson Moran state that the northern area of the site lies in a "Radon Affected Area" as defined by Public Health England, located in an area where between 3% and 5% of residential properties are projected to contain radon above the residential action threshold. Tier Environmental have further reviewed UK Radon mapping which suggest the north of the site is within an area where 5-10% of properties are above the action level, and the southwest is within the 3-5% area. According to BRE Report BR211 (2015) Radon: Protective Measures for New Buildings, radon protection measures *are* required under building regulations for new buildings at this location.
Further works identified	Hilson Moran recommended that an intrusive ground investigation be carried out as part of the design process of the proposed development.

4. FIELDWORK

The information contained in this report is limited to areas of land accessible during the ground investigation within the site boundary, as indicated on the site exploratory hole location plan, presented in Appendix A as Drawing No. TE1890-TE-00-XX-DR-GE-006-V01.

Tier Environmental scoped the intrusive ground investigation using guidance presented in:

- BS 10175:2011+A2:2017;
- Land Contamination Risk Management (LCRM) - https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm;
- BS 5930:2015+A1:2020; and,
- BS EN 1997:2004 and 2007.

Tier Environmental's standard strata description criteria are compliant with the above guidance.

4.1. Scope of Ground Investigation

The ground investigation was conducted between 2nd and 18th December 2024 and was supervised by a suitably qualified Tier Environmental engineer. Table 4.1 below provides a summary of the exploratory holes completed and rationale. Exploratory hole locations are presented on Drawing No. TE1890-TE-00-XX-DR-GE-006-V01.

Table 4.1 Scope of Ground Investigation and Rationale

Exploratory Hole Type	Exploratory Hole Reference	Exploratory Hole Depths (m bgl)	Rationale
Trial pits	TP01 to TP17	2.00m to 3.20m bgl	To confirm the shallow ground conditions across the site, relatively shallow groundwater presence and rate of inflow, stability of excavations, and to enable shallow soil sampling for geotechnical and geoenvironmental parameters.
Window sample boreholes	WS01 to WS25	3.40m to 5.50m bgl	To confirm the shallow ground conditions across the site, conduct *in situ* geotechnical tests, facilitate soil sampling for geotechnical and geoenvironmental parameters and installation of gas/groundwater monitoring wells.
Cable Percussion boreholes	CP01 to CP18	10.05m to 10.75m bgl	To confirm the deep ground conditions across the site, conduct in situ geotechnical tests, facilitate soil sampling for geotechnical and geoenvironmental parameters and installation of gas/groundwater monitoring wells.

Trial pits were backfilled with arisings in approximate reverse order and left slightly mounded to allow for future settlement; these are likely to settle below existing ground level with time and be unsuitable for trafficking over

No constraints were encountered during the ground investigation.

Table 4.2 Scope of Monitoring Installations

Exploratory Hole Location	Strata Targeted	Slotted Response Zone (m bgl)	Rationale
CP01	Till	1.00 to 9.00	Targeting deep groundwater monitoring body.
CP02	Till	1.00 to 9.00	
CP03	Till	1.00 to 9.00	
CP04	Till	1.00 to 10.00	
CP05	Till	1.00 to 10.00	
CP06	Till	1.00 to 10.00	
CP07	Till	1.00 to 10.00	
CP08	Till	1.00 to 10.00	
CP09	Till	1.00 to 10.00	
CP10	Till	1.00 to 8.70	
CP11	Till	1.00 to 9.00	
CP12	Till	1.00 to 10.00	
CP13	Till	1.00 to 10.00	
CP14	Till	1.00 to 10.00	
CP15	Till	1.00 to 10.00	
CP16	Till	1.00 to 8.70	
CP17	Till	1.00 to 8.70	
CP18	Till	1.00 to 9.00	
WS03	Till	1.00 to 3.80	Targeting shallow groundwater monitoring body.
WS04	Till	1.00 to 3.00	
WS06	Till	1.00 to 3.80	
WS08	Till	1.00 to 4.00	
WS09	Till	1.00 to 3.50	
WS12	Till	1.00 to 3.80	

Depths and accurate descriptions of strata and groundwater observations made during investigation works, together with details of the samples recovered, are presented on the Engineer's exploratory hole records in Appendix B.

4.2. Geoenvironmental Testing

Sampling and QA/QC protocols are presented in Appendix L. Tier Environmental's schedule of chemical laboratory testing is presented in Table 4.3 and Table 4.4. The testing was carried out by Element Materials Technology, a UKAS and MCerts accredited laboratory.

Human Health and Preliminary Waste Classification Laboratory Testing

Based upon the conclusions of the preliminary risk assessment, Tier Environmental scheduled chemical laboratory testing on selected soil samples. The purpose of the testing was to:

- Determine the concentration and spatial distribution of potential contaminants of concern in the Made Ground;
- Determine the chemical composition and properties of the shallow natural soils; and,
- Undertake a *preliminary* soils waste classification and waste disposal route determination.

Table 4.3 Schedule of Chemical Testing for Human Health Risk Assessment and Preliminary Waste Soils Assessment.

Laboratory analysis	Topsoil	Made Ground 1	Natural Soils (Peat)	Natural Soils (Till)
Tier Environmental soil suite*	18	2	2	5
Speciated TPH / BTEX / MTBE	18	2	2	5
BRE SD-1 Suite	0	0	1	26

*For definition of Tier Environmental analytical suites, please see Appendix L. NA - not applicable.

Controlled Waters Laboratory Testing

Based upon the conclusions of the preliminary risk assessment, Tier Environmental scheduled chemical laboratory testing on selected groundwater samples. The purpose of the testing was to:

- Determine the dissolved phase concentrations of potential contaminants of concern within groundwater beneath the site.

Table 4.4 Schedule of Chemical Testing for Controlled Waters Risk Assessment.

Laboratory analysis	Groundwater
Tier Environmental groundwater suite*	8
Speciated TPH (CWG) C5 to C40	8

4.3. Geotechnical Testing

Geotechnical laboratory testing was scheduled by Tier Environmental on selected samples as presented in Table 4.5. The testing was performed by Murray Rix, a UKAS accredited laboratory. Test certificates including details of appropriate testing standards are presented in Appendix E and discussed in Section 6, below.

Table 4.5 Geotechnical Laboratory Testing Schedule.

Test	Stratum type	Number of tests	Rationale
1. General			
Moisture content	Till (Cohesive and granular)	32	a) Assist with the determination of consistency of soil with depth. b) Assess desiccation of soils. c) Suitability of materials for reuse within earthworks.
2. Classification			
Atterberg limit	Till (Cohesive)	26	a) Volume change potential. b) Plasticity assessment (comply with Eurocode 7 description) c) Consistency Index. d) Determine soil type (e.g., clay/silt). e) Use as an empirical guide to soil shear strength
Particle size distribution (wet/dry sieve)	Till (Cohesive and granular)	8	a) Classify soils for earthworks purposes. b) Establish type of soil (comply with Eurocode 7 description).

Test	Stratum type	Number of tests	Rationale
3. Chemical tests			
BRE SD1 Suite	Till (Cohesive)	11	Determine correct class of concrete for both natural and made ground with specific tests for sites potentially containing sulphides (e.g., pyrites) or at low ph.
4. Compaction			
2.5 kg rammer dry density/moisture content relationship test	Made Ground	4	Establish maximum dry density and optimum moisture content of materials to assess suitability for reuse within earthworks
	Till (Cohesive and granular)	7	
Particle density	Made Ground	4	Used to calculate 0%, 5% and 10% air voids lines on dry density moisture content relationship plots.
	Till (Cohesive and granular)	7	
6. Shear strength (total stress)			
Unconsolidated undrained triaxial ("quick undrained triaxial")	Till (Cohesive)	34	Quantitative means of determining undrained shear strength of soils for: a) use in bearing capacity calculations; b) modelling the short term behaviour of slopes and retaining structures; c) pile design; d) determining suitability of cohesive materials for vibro-replacement ground improvement techniques.

5. GROUND CONDITIONS

The following section provides a summary of the ground conditions encountered during the ground investigation including strata profile, obstructions and visual / olfactory evidence of contamination. Exploratory hole logs are provided in Appendix B.

Photographs of ground investigation works are provided in Appendix G.

5.1. Strata Profile

Figure 5.1 and Figure 5.2 presented below provide a schematic summary of the ground conditions beneath the site. The distinct populations of strata identified have been numbered and correspond with the more detailed descriptions below.

Figure 5.1 Schematic Drawing of Ground Conditions

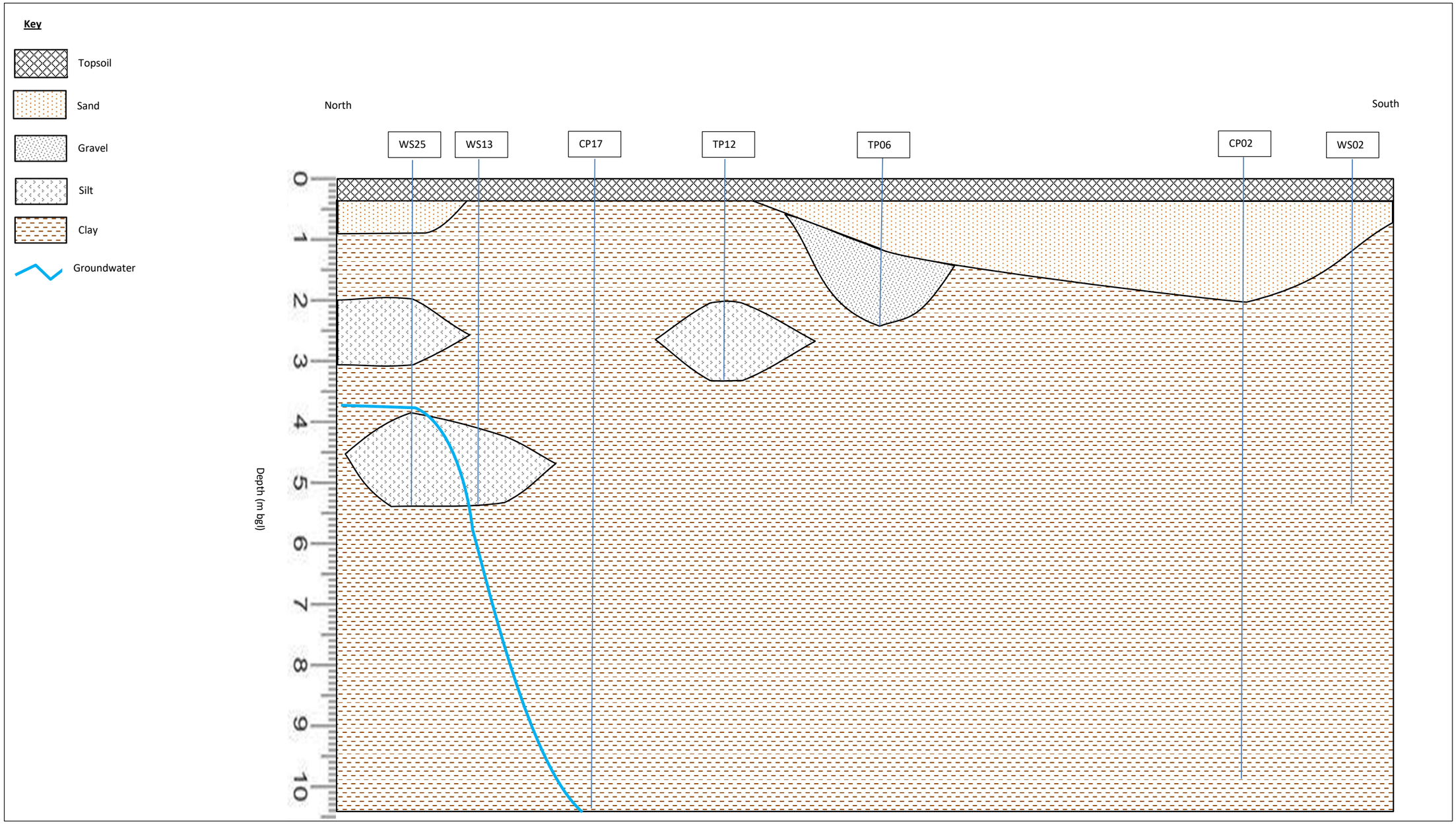
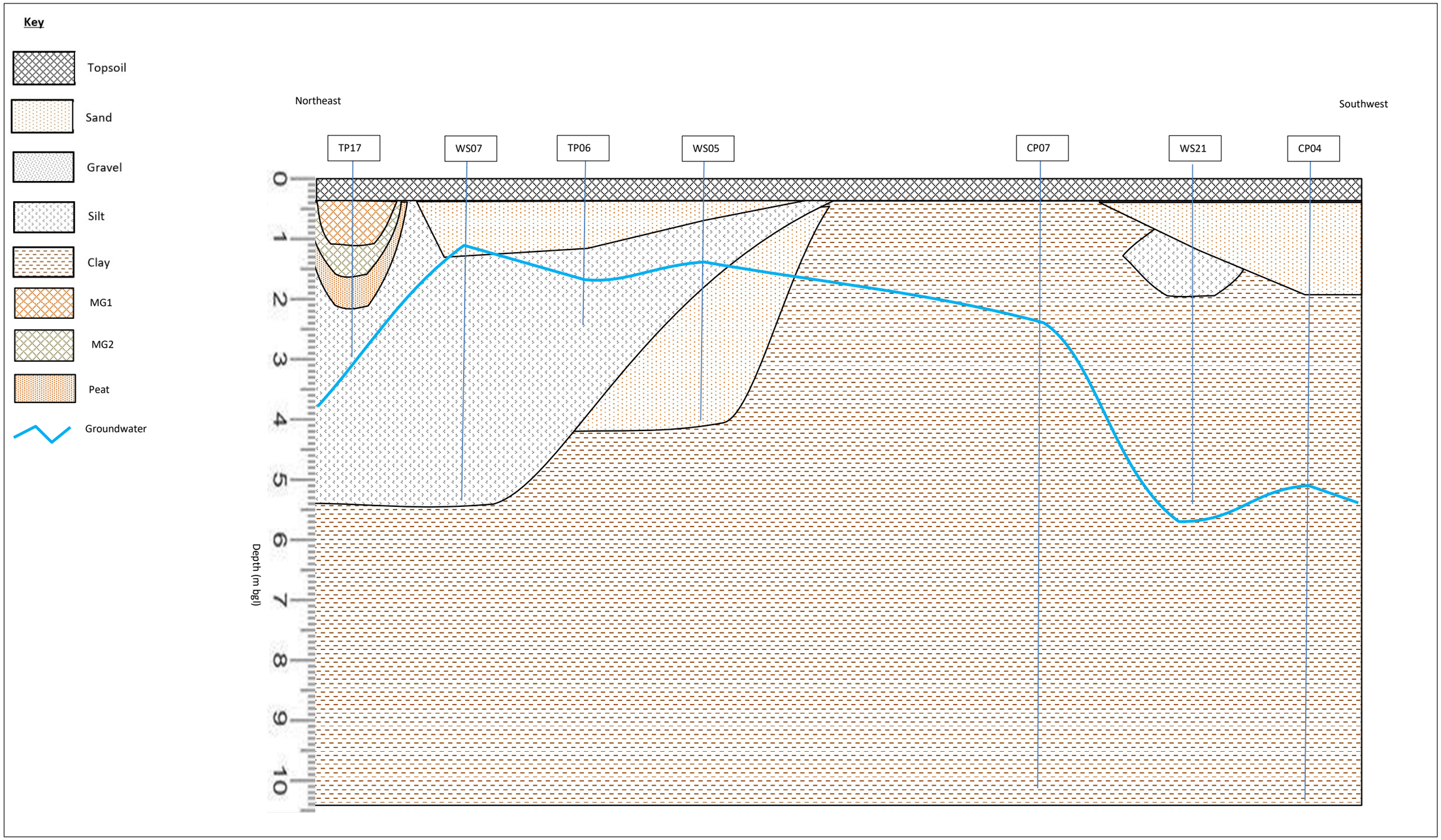


Figure 5.2 Schematic Drawing of Ground Conditions



5.2. Strata Descriptions

Topsoil

Locations encountered	All locations
Depths encountered from top of stratum (range)	Ground level
Depths encountered to base of stratum (range)	0.25m to 0.50m bgl
Thickness (range)	0.25m to 0.50m
Spatial location on site	Widespread across site
General description	Dark brown silty, variably sandy and gravelly Clay.

Made Ground – MG1

Locations encountered	TP17 and TP18
Depths encountered from top of stratum (range)	0.30m bgl
Depths encountered to base of stratum (range)	0.80m to 1.10m bgl
Thickness (range)	0.50m to 0.80m
Spatial location on site	No strong spatial correlation observed
General description	Dark to light brown, silty, slightly gravelly, fine to coarse SAND. Gravel is medium to coarse, subrounded to rounded of mudstone, plastic and quartzite

Made Ground – MG2

Locations encountered	WS17
Depths encountered from top of stratum (range)	1.1m bgl
Depths encountered to base of stratum (range)	1.55m bgl
Thickness (range)	0.45m
Spatial location on site	North-east area of the site
General description	Dark grey, silty, angular to rounded COBBLE of brick, ceramic and tile

Peat

Locations encountered	TP17 and TP18
Depths encountered from top of stratum (range)	1.55m to 2.50 m bgl
Depths encountered to base of stratum (range)	2.10m to 2.70 m bgl
Thickness (range)	0.20m to 0.55m
Spatial location on site	Encountered within the vicinity of historic pond features.
General description	Dark brown fibrous PEAT

Drift Deposits – DD1

Till– clay	
Locations encountered	CP01 – CP18, TP01-TP05, TP07-TP10, TP12-TP16, WS02-WS04, WS06-WS16 and WS18 to WS26
Depths encountered from top of stratum (range)	0.30m to 2.20m bgl
Depths encountered to base of stratum (range)	2.00m to 10.45m bgl
Thickness (range)	1.7m to 10.15m
Spatial location on site	Widespread across the site.
General description	dark greyish brown to reddish brown mottled grey, slightly silty, gravelly sandy CLAY. Sand is fine to medium, gravel is subrounded to rounded, fine to medium of mudstone and quartz.

Drift Deposits – DD2

Till - Sand	
Locations encountered	CP02, CP04-CP06, CP08, CP12, CP14, CP15, TP01, TP02, TP04-TP11, TP13, TP14, WS01-WS09,WS16, WS17 and WS19-WS26
Depths encountered from top of stratum (range)	0.25m to 7.0m bgl
Depths encountered to base of stratum (range)	0.85 m to 9.00m bgl
Thickness (range)	0.25m to 2.6m
Spatial location on site	Widespread across the site.
General description	dark brown, slightly silty clayey SAND. Sand is fine to medium.

Drift Deposits – DD3

Till - Silt	
Locations encountered	TP08-TP14, WS03, WS05-WS07, WS10-WS12, WS14- WS18, WS21 and WS24-WS26
Depths encountered from top of stratum (range)	0.60m to 4.00m bgl
Depths encountered to base of stratum (range)	1.70m to 5.50m bgl
Thickness (range)	0.70m to 3.95m
Spatial location on site	Widespread across the site.
General description	Grey, brownish grey and reddish brown, clayey SILT

5.3. Obstructions

No structures / underground services / obstructions were encountered during the ground investigation works.

5.4. Visual and Olfactory Evidence of Contamination

No visual or olfactory evidence of contamination was noted during Tier Environmental's investigation.

5.5. Groundwater Observations During Fieldwork

Table 5.1 below provides a summary of the groundwater observations during the fieldworks. Further information of groundwater observed is presented in the exploratory hole logs in Appendix B.

Table 5.1 Field Observations of Groundwater.

Exploratory hole	Strike (m bgl)	Rise in groundwater after 20 mins. (m bgl)	Formation	Observations
CP01	1.8	0	Till	Sub-artesian conditions.
CP04	5.0	4.8	Till	Slow ingress, sub-artesian or artesian conditions.
CP05	2.30	0	Till	Slight ingress, sub-artesian conditions.
CP06	7	6.8	Till	Sub-artesian conditions.
CP07	2.50	2.0	Till	Sub-artesian conditions.
CP08	2.20	1.9	Till	Sub-artesian conditions.
CP12	6.0	5.8	Till	Slight sub-artesian conditions.
CP14	7.0	6.7	Till	Slight sub-artesian conditions.
CP15	6.0	5.8	Till	Slight sub-artesian conditions.
CP16	3.20	2.7	Till	Sub-artesian conditions.
TP01	1.7	0	Till	Moderate ingress, sub-artesian conditions.
TP02	2.90	0	Till	Moderate ingress. sub-artesian conditions.
TP04	1.70	0	Till	Moderate ingress, sub-artesian conditions.
TP06	1.90	N/A	Till	Fast ingress causing pit wall collapse.
TP08	1.45	N/A	Till	No rise
TP11	1.80	N/A	Till	No rise
TP18	1.10	N/A	Made ground	No rise
WS01	1.80	N/A	Till	No rise
WS05	1.70	0.7	Till	Sub-artesian conditions.
WS07	1.20	N/A	Till	No rise
WS08	5.0	N/A	Till	No rise
WS10	3.60	N/A	Till	No rise
WS11	3.50	0.50	Till	Sub-artesian conditions.
WS12	3.60	N/A	Till	No rise
WS16	3.0	N/A	Till	No rise
WS17	3.0	0.2	Till	Sub-artesian conditions.
WS19	1.80	N/A	Till	No rise
WS20	1.80	N/A	Till	No rise
WS23	5.30	N/A	Till	No rise
WS25	3.70	N/A	Till	No rise
WS26	1.2	N/A	Till	No rise

Groundwater levels were recorded between 1.20m and 7.00m bgl. In several locations where groundwater was encountered the level was noted to increase either slightly or significantly, in some cases to near or at ground level such as CP01, CP05, TP01, TP02, TP04 and WS17. This generally indicated possible sub-artesian conditions across site. whilst groundwater was not recorded to overflow above ground level, possible artesian conditions could be created following regrading works and this should be considered within the drainage scheme.

5.6. Groundwater Monitoring

Table 5.2 below provides a summary of the groundwater monitoring results conducted to date. In total, 4 No, visits have been carried out between the 9th January and 7th February 2025.

Table 5.2 Groundwater Monitoring Results Summary

Exploratory hole	Response Zone	Depth range (m bgl)	Formation
CP01	1.00 to 9.00	1.11-1.29	Till
CP02	1.00 to 9.00	0.74-0.88	Till
CP03	1.00 to 9.00	2.92-3.38	Till
CP04	1.00 to 10.00	0.77-0.91	Till
CP05	1.00 to 10.00	0.59-0.73	Till
CP06	1.00 to 10.00	0.78-1.00	Till
CP07	1.00 to 10.00	1.19-1.22	Till
CP08	1.00 to 10.00	1.08-1.40	Till
CP09	1.00 to 10.00	0.94-1.21	Till
CP10	1.00 to 8.70	0.60-10.93	Till
CP11	1.00 to 9.00	0.81-1.72	Till
CP12	1.00 to 10.00	1.28-1.38	Till
CP13	1.00 to 10.00	0.88-0.97	Till
CP14	1.00 to 10.00	0.71-1.13	Till
CP15	1.00 to 10.00	1.15-1.29	Till
CP16	1.00 to 8.70	1.19-1.37	Till
CP17	1.00 to 8.70	0.56-0.74	Till
CP18	1.00 to 9.00	0.86-1.01	Till
WS03	1.00 to 3.80	0.15-0.18	Till
WS04	1.00 to 3.00	0.42-0.77	Till
WS06	1.00 to 3.80	0.10-0.99	Till
WS08	1.00 to 4.00	0.93-1.15	Till
WS09	1.00 to 3.50	1.13-1.15	Till
WS12	1.00 to 3.80	0.89-1.10	Till

Groundwater levels during monitoring were recorded generally within the top 2.0m of ground, locally at circa 3.0m bgl in CP03. These show a general shallow groundwater level across the entire site within the Till.

6. PRELIMINARY GEOTECHNICAL ASSESSMENT

6.1. Determination of pH and Water-Soluble Sulphate

Consideration of Chloride and Nitrate

In accordance with BRE SD1 for ground suspected of containing mineral acids of industrial origin, a determination must be made as to whether Chloride (Cl) and Nitrate (NO3) need to be analysed. In the event that they do, and elevated concentrations of Cl and NO3 are reported, this may indicate that hydrochloric and nitric acids (HCl and HNO3) are present. The effect of these acids on concrete is likely to be similar to that of sulfuric acid; so, for classification purposes, their chemically equivalent sulphate concentration should be calculated and added to any actual soluble sulphate present (as SO4 mg/l) in the respective samples: SO4 equivalent of Cl = Cl x 1.35mg/l SO4 equivalent of NO3 = NO3 x 0.77mg/.l

Firstly a determination has been made as to whether a significant number of reported pH values are lower than pH 5.5. If they are, then amounts of chloride and nitrate (NO3) should also be determined (in mg/l) in addition to sulphate content.

The conclusion of this assessment is that a significant number of pH values are **not** lower than pH 5.5 and so no further consideration of Chloride (Cl) and Nitrate (NO3) needs to be conducted.

Consideration of Magnesium Levels

In accordance with BRE SD1, when the water soluble sulphate concentration or groundwater sulphate concentration is greater than 3000mg/l, an additional consideration of the level of magnesium is required.

In this instance, no reported concentrations of water soluble sulphate or sulphate in groundwater have been reported above 3,000mg/l and therefore no further consideration of magnesium has been made.

In accordance with BRE SD1, there is no need to take magnesium levels into account for natural ground – the 'm' suffix Design Sulphate Classes only apply to brownfield locations. This is because, in natural ground conditions in the UK, magnesium levels are invariably well below values that may significantly affect concrete.

Sulphide Bearing / Pyritic Ground Assessment

In accordance with 'Concrete in aggressive ground' Special Digest 1:2005 (Third Edition), Tier Environmental has first sought to establish whether the site lies within an area where pyrite bearing natural ground exists that could result in additional sulphate being converted from sulphides (particularly pyrite) during enabling works, earthworks and/or construction activities.

Firstly, the site location has been plotted on the extracted figure from BRE SD1 that shows the Principal Sulphate and Sulphide Bearing Strata in England and Wales, as shown on Figure 6.1 below.

Figure 6.1 Site Location Plotted on Principal Sulphate and Sulphide Bearing Strata in England and Wales (Extracted from BRE SD1)

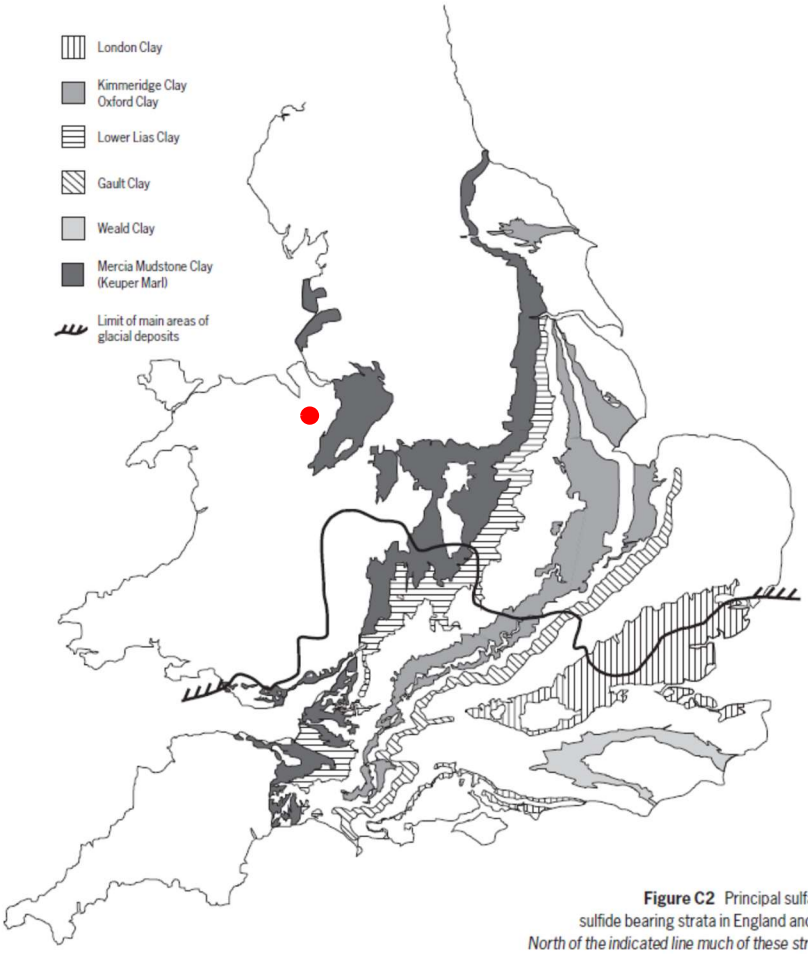


Figure C2 Principal sulfate and sulfide bearing strata in England and Wales
North of the indicated line much of these strata are covered by glacial deposits which, if partly derived from the indicated strata, may also contain sulfates and sulfides

Secondly, an assessment has been made of the site's location relative to coal mining areas of Great Britain on the figure below. This has been done because these represent areas where sulphate bearing coal mining wastes and metal processing slags are most likely to be encountered.

Figure 6.2 Site Location Plotted Relative to Coal Mining Areas of Great Britain (Extracted from BRE SD1)

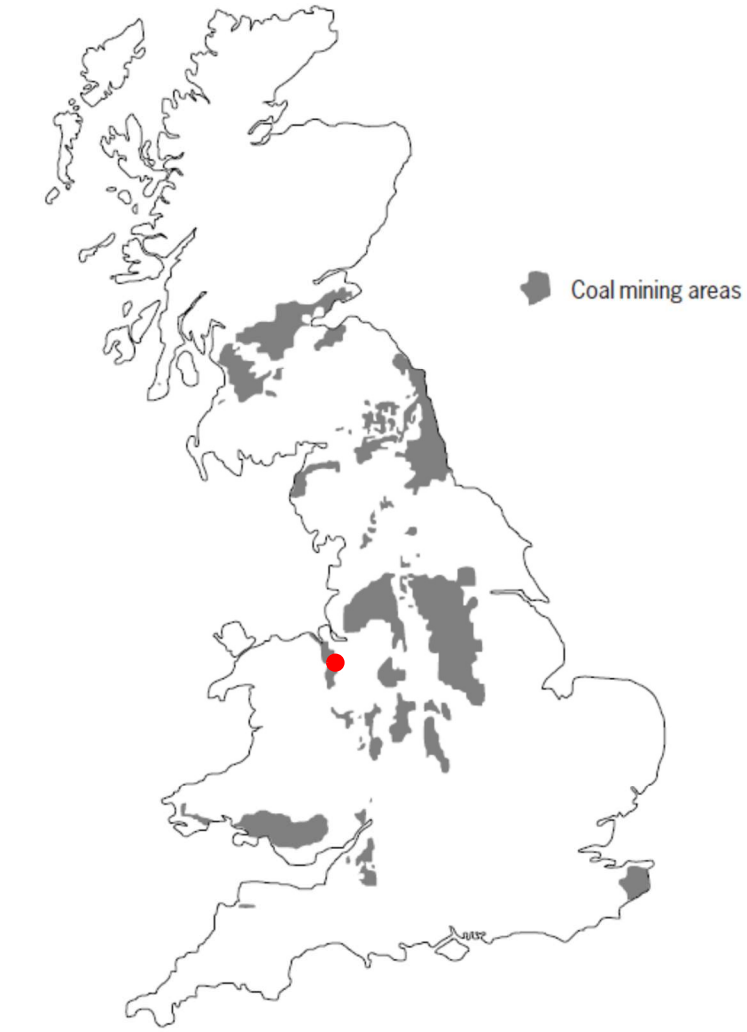


Figure C3 Coal mining areas of Great Britain where sulfate bearing, coal mining wastes and metal processing slags are most likely to be encountered

The table below has been developed to determine whether, based on the above assessment whether there is a possibility of sulphides in the ground (e.g. pyritic ground):

Table 6.1 Assessment for Potential Sulphide Bearing (e.g. Pyritic) Ground

Question 1:	Question 2:	Question 3 (only relevant if answer to Question 2 is 'Yes'):	Question 4:	Conclusion of Assessment for Potential Sulphide Bearing Ground
From Figure 6.1, Does the Site Lie Within a Principal Sulphate and Sulphide Bearing Area?	From Figure 6.1, Does the Site Lie North of the Black Line Indicating Extent of Glacial Deposits ?	Is it considered that the Glacial Deposits beneath the Site are Derived from Principal Sulphate and Sulphide Bearing Strata (even if the answer to Question 1 is 'No')?	From Figure 6.2, Does the Site Lie Within a Coal Mining Area?	
No	Yes	No	Yes	The conclusion of the assessment is that there **is** the potential for sulphide (e.g. pyritic) bearing ground and further assessment of this is required in accordance with BRE SD-1.

Oxidisable Sulphides Calculation

The table below has been prepared in order to further assess, based on the laboratory data, whether there is likely to be pyrite present which may oxidise if the ground is disturbed:

Table 6.2 Oxidisable Sulphides Calculations

Exploratory Hole Location	Depth (m bgl)	Total Sulphur (TS) Concentration (%)	Calculated Total Potential Sulphate (TPS) (%)*	Acid-Soluble Sulfate (AS) Concentration (%)	Calculated Oxidisable Sulphides (OS) (%)#
Drit Deposits					
CP01	1	0.02	0.06	0.02	0.04
CP02	1	0.01	0.03	<0.01	N/A
CP06	1	0.03	0.09	0.03	0.06
CP06	2	0.02	0.06	0.01	0.05
CP07	0.5	0.02	0.06	0.02	0.04
CP08	1	0.04	0.12	0.04	0.08
CP08	2.5	0.17	0.51	0.05	0.46
CP10	0.7	0.03	0.09	0.01	0.08
CP11	1	0.02	0.06	0.01	0.05
CP12	0.7	0.06	0.18	0.08	0.10
CP03	1	0.02	0.06	0.02	0.04
CP04	0.8	0.03	0.09	0.03	0.06
CP09	0.9	0.02	0.06	0.03	0.03
CP13	1	0.03	0.09	0.04	0.05
CP15	0,8	0.03	0.09	0.02	0.07
TP17 (Peat)	1.6	0.17	0.51	0.10	0.41
WS26	1.5	0.02	0.06	0.02	0.04

Note: * TPS = = 3 x total sulphur (TS % S). # OS = TPS - AS

Conclusion

A determination has been made as to whether the calculated Oxidisable Sulphides (%) are "*greater than 0.3% for a significant number of samples*", in accordance with BRE SD1. The conclusion of this assessment is that a significant number of samples are **not** in excess of 0.3% with respect to calculated Oxidisable Sulphides (%).

This does **not** indicate the presence of pyrite (which would otherwise oxidise if ground were disturbed) and in which case the design sulphate class may be determined solely on soil and groundwater sulphate concentrations and pH in accordance with BRE SD-1.

Design Sulphate Classification

Representative samples of the soils and groundwater encountered during the Tier Environmental ground investigations, were tested to determine their pH and concentrations of water-soluble sulphate (SO_4^{2-}). The results are presented in Appendix C and Appendix D and summarised in Table 6.3 below. It is assumed that the site is a 'natural ground' site, and the groundwater is 'mobile' in accordance with BRE SD1.

The conclusion of the assessment is that a DS-1 and ACEC Class AC-1s is appropriate for buried concrete design purposes, with due consideration of the sub-sections above (which include consideration of chloride, nitrate, magnesium and potential for sulphide bearing (e.g. pyritic) ground).

Whilst no evidence of gross hydrocarbon contamination has been observed at the site, it is a concrete specialist should review the TPH results and ground conditions summary within this report to ensure appropriate concrete design against retardation / degradation due to hydrocarbons.

Table 6.3 Results of Soil pH Testing and Water-Soluble Sulphate Determination

Exploratory Hole Location	Depth (m bgl)	pH	Water-soluble sulphate (mg/l)	Design sulphate class	ACEC sulphate class
Made Ground					
TP17	0.90	6.86	56.1	DS-1	AC-1
TP18	1.50	7.84	40.5		
Peat					
TP17	1.60	7.08	28.7	DS1	AC-1
Till					
WS26	1.50	8.1	22.3	>20 No. samples so the mean of the highest 20% is used as the design value: 73 mg/l DS-1	>20 No. samples so the mean of the lowest 20% is used as the design value: 7.04 AC-1
TP18	2.80	8.07	97.1		
CP03	1.00	8.46	14.8		
CP04	0.80	7.41	31.9		
CP09	0.90	6.88	25.5		
CP13	1.00	7.43	36.5		
CP15	0.80	8.15	18.2		
CP01	1.00	6.97	11.9		
CP02	1.00	7.47	13.7		
CP06	1.00	7.36	26.5		
CP06	2.00-2.45	7.99	15		
CP07	0.50	6.87	19.3		
CP08	1.00	7.91	20.4		
CP08	2.50	8.49	40		

CP10	0.70	8.46	22.8		
CP11	1.00	8.08	35.3		
CP12	0.70	7.23	51.1		
CP14	1.20-1.65	7.74	14		
CP16	0.50	8.26	28		
CP17	0.70	7.82	25.8		
CP18	0.60	7.51	33.1		
CP02	5	8.33	86		
CP11	4	8.34	72		
CP10	8	8.53	38		
CP04	6	8.59	40		
CP05	0.6	7.21	21		
CP06	6	8.33	73		
CP07	6.5	8.5	64		

ACEC - Aggressive Chemical Environment for Concrete (see BRE, 2005).

6.2. Geotechnical Parameters

Soil Classification

Cohesive Soils

Moisture content and Atterberg Limit testing was undertaken on samples from cohesive superficial material at the site. A summary of the results is shown in Table 6.4 below.

Table 6.4 Summary of Natural Moisture Content and Atterberg Limits

Exploratory hole	Depth (m bgl)	Stratum	MC (%)	LL (%)	PL (%)	PI (%) (Modified)	Class	Volume Change Potential	Consistency Index
CP16	1.2-1.65	Till	18.6	36	14	22	Medium	Medium	0.79
CP17	1.2-1.65	Till	17.6	41	16	25	Medium	Medium	0.94
TP01	1.90	Till	20.0	41	17	24	Medium	Medium	0.88
TP04	2.00	Till	19.9	36	15	21	Medium	Medium	0.77
TP05	1.20	Till	25.0	46	19	27	Medium	Medium	0.78
TP12	1.00	Till	20.8	43	18	25	Medium	Medium	0.89
TP15	1.80	Till	19.9	39	17	22	Medium	Medium	0.87
WS02	2.00	Till	21.5	43	18	25	Medium	Medium	0.86
WS03	2.00	Till	20.3	38	15	23	Medium	Medium	0.77
WS07	1.4	Till	26.2	44	19	25	Medium	Medium	0.71
WS08	1.0	Till	23.5	41	19	22	Medium	Medium	0.79
WS11	1.5	Till	23.0	38	16	22	Medium	Medium	0.68
WS12	1.7	Till	24.1	45	18	27	Medium	Medium	0.77
WS13	1.0-1.3	Till	22.8	37	14	23	Medium	Medium	0.62
WS15	0.7-1.0	Till	24.1	41	17	24	Medium	Medium	0.7
WS20	2.0-2.45	Till	30.8	59	24	35	High	High	0.81
WS21	1.2-1.65	Till	20.4	43	15	28	Medium	Medium	0.8

ND - Not determined; MC - Moisture content, LL - Liquid limit, PL - Plastic limit, PI - Plasticity index.

A total of 17 No. Atterberg Limit Tests were performed on samples of identified cohesive soil, recording medium volume change potential soils with localised high volume change potential around WS20.

Particle Size Distribution Tests

A total of 8 No. samples of natural superficial strata were submitted for Particle Size Distribution tests. The tests show a distinction between the stratum types with 7 No. samples confirmed as cohesive strata, described as silty very sandy slightly gravelly Clay, and a single sample of the granular Till recorded as a clayey Sand & Gravel. All samples recorded a high proportion of fines ranging from circa 20%-40% silt/clay content.

Shear Strength Parameters

A total of 30 No. multistage total stress undrained triaxial tests were performed on the natural clay strata encountered within the exploratory holes. Single stage tests were performed and these yielded value of undrained shear strength (Cu). A summary of the test results obtained for the natural clay strata is given in Table 6.5 below.

Table 6.5 Summary of undrained shear strength values for natural clay strata

Material Type	Minimum Shear Strength Cu (kPa)	Maximum Shear Strength Cu (kPa)	Average Shear Strength Cu (kPa)
Silty slightly sandy slightly gravelly Clay	28	173	60.66

The test results show a reasonable variation but also some increase with depth and from the triaxial test data, a moderately conservative undrained shear strength of 71kPa at between 1.2m-5m bgl, decreasing to 48kPa at between 5m-10m bgl is assessed for the natural clay strata.

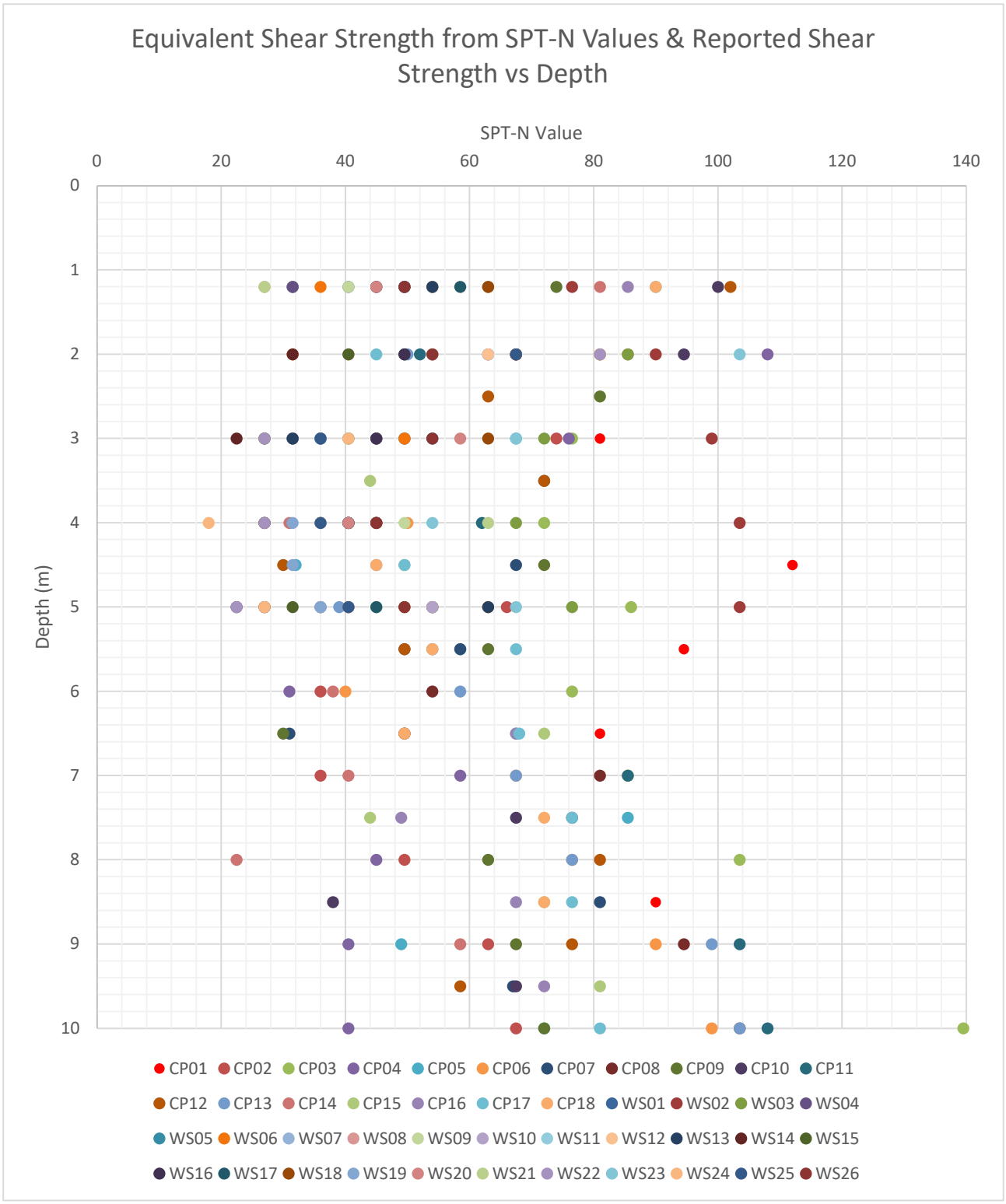
Standard Penetration Tests (SPT) were carried out in all of the boreholes. The undrained shear strength of the natural clay strata tested has been estimated using the relationship developed by Stroud, where:

Cu = f1 x SPT N60 value

The value of f1 is dependent on the Plasticity Index (Ip). By using the moderately conservative Plasticity Index of 25%, a characteristic value of f1 = 4.5 has been derived. The results of both laboratory determined shear strength and shear strength values derived from *in situ* standard penetration tests for the natural clay unit are presented in the figure overleaf.

Results indicate values of 18kPa-40kPa for a number of locations between 1.20m and 6.00m bgl, though also a wide range at each depth with 27kPa-102kPa at 1.20m alone. This attests to the variability in clay consistency recorded during field works. Locations with the softest readings were recorded in CP04, CP08, CP13, and variably throughout WS06, WS08, WS10, WS12 to WS16, WS19, WS20 and WS22 which generally corelates to the north, central and southwest of the site.

Figure 6.3 Shear strength from Triaxial Testing and SPT N value vs reduced depth



6.3. Foundation Recommendations

The site is covered in a veneer of Topsoil to circa 0.30m-0.35m bgl and underlain in only a few locations by shallow Made Ground in the form of infilled ponds consisting of sand and gravel encountered from 0.30m-1.55m bgl in TP17 and TP18. Natural soils of Glacial Till were recorded as soft to stiff clays/silts and loose to medium dense sands, to a maximum depth of 10.50m bgl in the Tier Environmental Investigation. It should also be noted that organic peat soils were recorded from 1.50m-2.10m and 2.50m-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays. These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation.

Given the encountered ground conditions, with localised soft (<40kPa) clay soils in a number of locations between 1.20-6.00m bgl, and variable loose granular soils, and taking in account the nature of the proposed development and initial discussions with specialist contractors, the most economic foundation solution is likely to be ground improvement, such as rigid inclusions/CMCs and/or vibro stone columns supporting pad foundations. This would be adopted for the entire structure, dependent upon the design requirements and economic feasibility.

Preliminary discussions with a specialist contractor suggest vibro stone columns could be utilised beneath the foundations and slabs dependant on the required loads for a bearing capacity of 150kPa. If higher loadings on the slabs are proposed it may be required to utilise a Controlled Modulus Columns technique to reduce settlements in the deeper layers where there is some soft to firm material shown in the Till. It was stated that CMCs should provide a bearing capacity of 200kPa. Loadings will require evaluating once proposed earthworks, up to 4.0m of fill locally, have been finalised. Different foundation methods will need to be considered for each unit taking into account regrading works, ground conditions and loadings.

Ground improvement is a specialist job and the advice of a reputable local contractor familiar with the type of ground and groundwater conditions encountered on this site should be sought prior to finalising the design. The ground improvement contractor will need to consider the variable depth of Made Ground beneath the proposed retail unit and the proposed regrading works in their design to ensure that total and differential settlements will be within tolerable limits.

Consideration will need to be given to the sub-artesian groundwater conditions encountered across site, and the proposed cut of up to 2m-3m within the southern are of the site which may result in artesian groundwater conditions. Artesian groundwater issues will need to be accounted for in the proposed earthworks and surface water drainage design for the development.

6.4. Floors

With regard to the design and construction of normal ground bearing floor slabs, it must be noted at the outset, that due to the thickness of localised soft cohesive strata and variability across the site, unless appropriate measures are taken, there will be a risk of significant total and differential settlements. It is anticipated that a degree of earthworks will be required to achieved proposed site levels.

It is considered that the most economic solution will be ground bearing floor slabs following the installation of vibro stone columns and/or CMCs to minimise the risk of unacceptable total and differential settlements. This would need to be assessed for each unit based on the proposed regrading works, loadings and whether the fill is lime/cement modified.

6.5. Earthworks

Construction plant should be provided with an adequate working platform in line with the requirements of BRE report, “BR 470: Working Platforms for Tracked Plant”. Again, further advice should be sought from the temporary works designer.

The laboratory compaction tests undertaken during the recent ground investigation were assessed by comparing the results against criteria commonly used in earthworks to achieve an adequate density for engineered fills. The criteria indicate whether the samples could achieve in excess of 95% of Maximum Dry Density (MDD – a requirement often included in highways specifications) and whether they could be compacted to less than 5% air voids ratio.

Subject to screening, crushing (unlikely to be required) and other suitability considerations, the natural and Made Ground should be suitable for use as an engineered fill.

The suitability for compaction is highly dependent on the initial moisture content. Table 6-6 below indicates that some conditioning of the Till material will be required during the enabling works to reduce the moisture content. Where granular soils are to be reused as an engineered fill, it would be sensible to subject them to a confirmatory testing regime where they are required to achieve a compaction specification as an engineered fill.

Table 6-6 Summary of Compaction Test Results

Sample Reference and depth (m bgl)	Material description	Natural Moisture Content (NMC) (%)	Optimum Moisture Content (OMC) (%)	Maximum Dry Density (MDD) (Mg/m3)	Moisture Content at 95% MDD	Conditioning Required Prioir to Reuse?
TP03 0.50m	Slightly sandy Clay (Till)	19.6	20	1.69	24.1	No conditioning required
TP04 at 0.50m	Silty Sand (Till)	15.8	13	1.92	16.5	No conditioning required
TP05 at 0.80m	Slightly gravelly clayey Sand (Till)	15.8	13	1.94	15.1	Yes – decrease moisture content
TP12 0.50m	Slightly sandy Clay (Till)	25.3	19	1.72	22.6	Yes – decrease moisture content
TP15 0.50m	Silty Clay (Till)	21.8	20	1.71	24	No conditioning required
TP16 1.00m	Silty Clay (Till)	22.4	21	1.74	23.8	No conditioning required
TP18 0.50m	Made Ground: Silty Sand	58.1	30	1.30	34.6	Yes – decrease moisture content
TP18 1.50m	Made Ground: Silty sandy/gravelly Clay	16.4	12	1.88	15.9	Yes – decrease moisture content
TP18 2.20m	Made Ground: Gravelly Sand	16.6	13	1.90	16.6	No conditioning required

Conditioning by means of windrows or lime/cement binders are likely to be required as the natural moisture contents for several samples are close to the upper limit of the anticipated acceptance envelope. The addition of lime/cement binders will also increase the bearing capacity of proposed floor slabs and could also reduce the importation of stone/hardcore for external hardstanding areas and highways.

6.6. Groundworks, Excavation Stability and Groundwater Dewatering

In our opinion, there should be no particular difficulties in excavating the strata indicated in the boreholes utilising an appropriate and suitably sized mechanical excavator. Excavations into existing Made Ground and the underlying natural soils should be assumed to be unstable. No man entry into unsupported excavations should be allowed without an appropriate risk assessment. Reference to CIRIA report 097 (1983) should be made to establish suitable means of support or battering of excavation sides.

Due to the presence of sub-artesian water on site there is potential for significant seepage of groundwater during earthworks, dewatering methods are anticipated to be necessary during excavation.

It is recommended that all excavations to greater than 1.20 metres depth, or for shallower excavations where groundwater is encountered above this level are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle. Standing groundwater levels of between 1.10m and 7.00m were encountered in the boreholes / trial pits. Should groundwater seepages occur, and water accumulate in shallow excavations it should be able to be removed by pumping from a filtered sump. However, groundwater control by more robust means, such as well pointing, may be required.

It should be noted that should deep excavations be required as part of the development, then we would recommend that the standpipes are monitored for groundwater levels for an extended period of time and take into consideration seasonal variations and periods of very wet weather to measure the fluctuation of the standing water levels. It should be noted that groundwater inflows and levels are likely to be subject to seasonal and climatic variations.

Great care will need to be taken if reducing groundwater levels to ensure that adjoining nearby buildings, structures and services (including the Welsh Water sewers) are not affected.

7. HUMAN HEALTH RISK ASSESSMENT

Results of chemical analysis are presented in full in Appendix C and Appendix D.

7.1. Data Interpretation Approach

The analytical data obtained were reviewed for completeness and consistency. The data for each sample type was then compiled, screened against the Generic Assessment Criteria (GACs) for a industrial land use and those potential contaminants of concern which were found to exceed the GACs were then subjected to detailed analysis as described below.

Previously, it was possible for results from soil (and leachate) samples to be subject to statistical assessment in accordance with a 2008 guidance document (CL:AIRE / CIEH Guidance on Comparing Soil Contamination Data with a Critical Concentration). This guidance has now been withdrawn and replaced with the following document:

- Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration (CL:AIRE 2020)

The purpose behind statistical assessment is ultimately to determine whether concentrations of contaminants are at levels that present potential risk to the future site users (and the wider environment if the statistical assessment is conducted on leachate test results).

The new guidance places even greater emphasis and reliance on the desk study being carried out first, appropriately detailed sampling strategies, collection and testing of samples for contamination and use of appropriate screening criteria.

The guidance requires an increased number of criteria to be met before a robust statistical assessment can be conducted and introduces the principle of the Central Limit Theorem (CLT); a key tool of statistics that is used in the comparison of confidence intervals with the critical concentration. A common ‘rule of thumb’ is that the CLT will apply provided your sample size is between 20 and 50.

On this basis, Tier Environmental considers that statistical assessment in accordance with the CL:AIRE 2020 guidance may not be applied in this instance given that the number of samples obtained is below 20 No. for any given identified soil population.

Due consideration of the ground conditions, distinct identifiable populations of soil and proposed development layout has been undertaken and, where appropriate, laboratory results associated with discrete populations or ‘hotspots’ have been assessed separately.

7.2. Selection of Generic Assessment Criteria (GAC)

In short, for the majority of the contaminants of concern, LQM/CIEH Suitable 4 Use Levels (S4ULs) published in 2015 have been adopted as GACs for a allotments land use; however, further details on the hierarchal approach for the selection of the GACs used as screening criteria for this assessment is provided in Appendix I.

These values are considered as appropriate screening criteria as they incorporate updated assumption exposures derived for the production of C4SLs but within the context of deriving screening criteria above which assessment of the risks or remedial action may be needed (i.e. within the context of the planning regime rather than Part 2A context for which C4SLs were derived).

For those potential contaminants of concern where the selected GAC is dependent on Soil Organic Matter content (SOM), an assumed SOM of 1% has been selected based on the reported Total Organic Carbon (TOC) concentrations (which have been converted to SOM by dividing by a conversion

factor of 0.58). It should be noted; however, that for any soil samples where the TOC may be artificially driven by the presence of petroleum hydrocarbons, that these TOC results have been removed from the data set when determining an appropriate characteristic SOM. For this purpose, Tier Environmental have notionally considered that any TOC results from soil samples where the measured total TPH concentration exceeds 500mg/kg should be removed.

7.3. Human Health Risk Assessment

No measured concentrations of potential contaminants of concern have been reported in excess of the respective GACs protective of human health for a commercial/industrial land use.

Asbestos

Asbestos can be present in soil as fragments of bulk Asbestos Containing Materials (ACMs) (e.g. asbestos cement sheeting) and also as discrete asbestos fibres within the soil matrix. This investigation has carried out assessments to determine whether both bulk fragments and / or fibres are present in the soil at the site. The asbestos assessment commenced on site with inspection of the Made Ground by our suitably qualified supervising engineer for the presence of bulk ACMs.

During the fieldwork no suspected ACMs were identified.

Of the 22 No. topsoil and 2 No. Made Ground samples submitted for asbestos screening, 2 No. were reported to contain asbestos. Those positive identifications are summarised in Table 7.1, below.

Table 7.1 Summary of Asbestos Assessment

Exploratory Hole Location	Depth (m bgl)	Location on Site Description	Soil Population	Asbestos Type	Quantification (% w/w)
Asbestos in Soil Samples					
WS04	0.10	Southwest	Topsoil	Fibre Bundles Chrysotile	<0.001
WS24	0.10	Northwest	Topsoil	Fibre Bundles Chrysotile	<0.001

While asbestos has been reported, the measured concentrations have been reported <0.001% w/w i.e. at 'trace' levels which are unlikely to trigger requirements during earthworks / construction works in accordance Control of Asbestos Regulations 2012.

Groundwater

No measured groundwater concentrations of potential contaminants of concern have been reported in excess of GACs SOBRA guidance for a commercial land use.

7.4. Utilities

It is recommended that the results of the chemical testing and details of the proposed remedial works are provided to the appropriate utility companies to determine the necessity for service protection.

7.5. Construction and Maintenance Workers

Contamination may pose a short-term (acute) or long-term (chronic) risk to workers during construction and maintenance. The potential risks must be specifically assessed as part of the health and safety evaluation for the works to be performed in accordance with prevailing legislation. Site practices must conform to the specific legislative requirements and follow appropriate guidance (e.g., HSE, 1991; CIRIA, 1996).

On the basis of the results obtained, the following potential exposure risks to construction and maintenance workers have been highlighted:

- Asbestos within topsoil in the southwest and northwest of the site.

Whilst asbestos has been reported during the ground investigation works, the measured concentrations have been reported <0.001% w/w i.e. at 'trace' levels which are unlikely to trigger requirements during earthworks / construction works in accordance Control of Asbestos Regulations 2012. However, in the event that previously unidentified asbestos is identified during future earthworks / construction works at concentrations above 0.001% w/w (i.e. above 'trace' levels), the Control of Asbestos Regulations 2012 should be adhered to. A summary of complying with CAR: risk assessments, licensing and training is therefore provided in Appendix N.

8. CONTROLLED WATERS RISK ASSESSMENT

8.1. Introduction

In order to assess whether there is a potentially unacceptable risk of pollution of controlled waters, samples of groundwater have been submitted for laboratory chemical analysis as per the summary presented in Table 4.4 within this report. Analytical data from groundwater sample testing undertaken by Tier Environmental have been evaluated against Water Quality Standard (WQS) values appropriate to the Conceptual Site Model.

In accordance with Part 2A of the Environmental Protection Act 1990, Tier Environmental has made regard to all of the WQS values that are relevant to the site and a judgment has been made against the most stringent of those relevant standards. Further details are provided, along with the approach for selection of TPH / BTEX WQS values, in Appendix J.

In some instances, the laboratory method detection limit is greater than the appropriate WQS value. In these instances, only measured concentrations in excess of the laboratory method detection limit have been considered likely to potentially represent a possible significant risk to controlled waters.

For those potential contaminants of concern for which the WQS values are dependent on hardness (e.g. cadmium EQS values), a hardness of ≥200 mg CaCO3/l has been selected based on the reported values in the groundwater beneath the site.

8.2. Controlled Waters Environment Conceptual Site Model Summary

The Till below site is a Secondary Undifferentiated Aquifer, the Salop Formation is classified as a Secondary (A) Aquifer With the Kinnerton Sandstone located to the south-east designated as a Principal Aquifer (offsite). As such, the overlying low permeability Till deposits can be expected to afford protection against the vertical migration of contaminants into the deeper Secondary A/ Principal aquifer. The site is not located within an area covered by a Source Protection Zone and no active potable water abstractions are present in the site's vicinity. The site is set within an area of significant wider historical commercial/industrial heritage. On this basis the controlled waters sensitivity for the Secondary A/Principal Aquifer is regarded as being low.

8.3. Groundwater Testing

Table 8.1 below summarises the measured concentrations of contaminants of concern from groundwater samples at the site that have been reported in excess of the respective WQS values.

Table 8.1 Summary of Measured Concentrations of Dissolved Phase Groundwater Potential Contaminants of Concern in Excess of WQS Values

Potential Contaminant of Concern	Units	LoD*	WQS	Maximum Concentration	No. samples >WQS	Monitoring Well Location
Copper	µg/l	<1	1	4	3 of 8	CP05, CP09, CP15
Zinc	µg/l	<1.5	10.9	57.2	1 of 8	CP05

* LOD= Laboratory Method Limit of Detection

Measured groundwater concentrations of copper and zinc have been reported in excess of the WQS protective of the controlled waters environment by either the same order of magnitude or one order of magnitude. Given the marginal nature of these exceedances, the potential for significant dilution between the site and any surface water bodies, the historical commercial / industrial heritage of the wider area surrounding the site, the potential for dilution with the groundwater body beneath the site to the more sensitive Principal Aquifer >10m bgl, the localised nature of those

dissolved concentrations in excess of the WQS and the absence of any reported widespread concentrations, the fact that the site will incorporate buildings / hardstanding and a dedicated drainage system that shall reduce infiltration rates through the soils, and the absence of any nearby potable groundwater abstractions, these measured concentrations are not considered to pose a risk to the controlled waters environment.

9. GROUND GAS RISK ASSESSMENT

9.1. Introduction

The ground gas risk assessment has been undertaken in accordance with the following guidance:

- BS 8485:2015+A1:2019;
- CIRIA C665, 2007;
- Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide Are Present, NHBC, 2007 (note that this is being withdrawn on 1st July 2025);
- A Pragmatic Approach to Ground Gas Risk Assessment RB17. CL:AIRE, 2012; and,
- Ground Gas Monitoring and 'Worst-Case' Conditions TB17, CL:AIRE, 2018

The ground gas risk assessment has been conducted with full consideration of the viable sources.

Ground gas monitoring was conducted in conjunction with groundwater monitoring (and sampling); however, it should be noted during the gas monitoring was conducted first, prior to any groundwater monitoring / sampling works. The monitoring well locations and construction were designed with due consideration of the proposed development layout and preliminary conceptual site model. Further information pertaining to monitoring wells is provided in Table 4.2.

9.2. Groundwater Conditions

BS 8576:2013 states *"Where practical and reasonable, the response zone for permanent gas monitoring wells should be located in an unsaturated zone. (Such a zone might exist below perched water tables and could form a migration pathway.) This is subject to intercepting all potential gas sources. For example, peat layers in alluvium might be below the groundwater table but pockets of gas can be trapped within the peat. In this case, it would be desirable for the well to penetrate below the groundwater. If there is doubt, it is useful to install wells with response zones above and below the water table."*

All wells monitored contained groundwater during the monitoring period and was encountered between 0.17m to 3.38m bgl. It was not possible to install shallow wells with response zones in unsaturated zone due to the shallow groundwater level encountered on site.

9.3. Gas Monitoring Data Quality

The calibration certificate for the Geotech GA5000 unit used on site for the reported gas monitoring results in Appendix F, is also provided in Appendix F. Field checks were conducted to ensure accuracy during the monitoring events. The locations for the monitoring wells are considered adequate to assess the current ground gas regime.

Flow rates and gas concentrations were allowed to fully stabilise during the monitoring.

9.4. Ground Gas Monitoring Results

The full ground gas monitoring results from the installations are presented in Appendix F and summarised below:

Table 9.1 Ground Gas Monitoring Results Summary – 4 No. Visits of Proposed Monitoring Programme of 4 No. Visits

Strata Targetted by Response Zone	Monitoring Well Reference	Maximum peak gas flow rate (l/h)	Maximum steady state gas flow (l/h)	Maximum peak CH_4 (%v/v)	Maximum steady state CH_4 (%v/v)	Maximum peak CO_2 (%v/v)	Maximum steady state CO_2 (%v/v)	Lowest O_2 recorded (%v/v)
Till	CP01	4.5	*0.1*	*0.1*	***0.1***	4.4	4.4	12.7
Till	CP02	6.7	0.2	*0.1*	*0.1*	1.4	1.4	18.7
Till	CP03	**14.3**	0.3	*0.1*	*0.1*	1.7	1.7	13.6
Till	CP04	*0.1*	*0.1*	*0.1*	*0.1*	0.7	0.4	20.2
Till	CP05	3.0	**3.0**	*0.1*	*0.1*	1.8	1.8	11.3
Till	CP06	-0.1	*0.1*	*0.1*	*0.1*	**5.6**	**5.6**	6.8
Till	CP07	-2.0	-0.2	*0.1*	*0.1*	5.4	5.4	2.3
Till	CP08	0.1	0.1	*0.1*	*0.1*	4.4	4.4	13.5
Till	CP09	2.2	*0.1*	0.1	*0.1*	2.9	2.9	12.9
Till	CP10	13.3	0.2	*0.1*	*0.1*	2.0	2.0	15.0
Till	CP11	7.4	0.2	*0.1*	*0.1*	0.6	0.6	12.3
Till	CP12	3.2	0.2	*0.1*	*0.1*	1.4	1.2	15.4
Till	CP13	2.3	0.3	*0.1*	*0.1*	1.7	1.7	18.1
Till	CP14	1.5	0.2	0.1	*0.1*	3.3	3.3	0.6
Till	CP15	*0.1*	*0.1*	*0.1*	*0.1*	0.6	0.6	15.8
Till	CP16	2.4	0.1	*0.1*	*0.1*	1.4	0.8	7.7
Till	CP17	6.9	0.8	*0.1*	*0.1*	2.4	1.9	15.7
Till	CP18	3.9	0.3	*0.1*	*0.1*	2.2	2.2	15.2
Till	WS03	6.0	*0.1*	*0.1*	*0.1*	1.5	1.4	4.9
Till	WS04	10.3	0.4	*0.1*	*0.1*	3.4	3.4	**3.6**
Till	WS06	3.3	0.2	**0.2**	*0.1*	3.7	3.7	5.0
Till	WS08	4.7	0.1	*0.1*	*0.1*	4.5	4.5	12.4
Till	WS09	*0.1*	*0.1*	*0.1*	*0.1*	3.7	3.7	14.6
Till	WS12	2.0	*0.1*	0.1	*0.1*	0.2	0.2	19.6

Bold = maximum value reported across all visits.

For information: gas analyser instrument limits of detection are as follows: Methane 0.1% v/v, Carbon Dioxide 0.1% v/v, Oxygen 0.1% v/v, Hydrogen Sulphide 1ppm, Carbon Monoxide 1ppm and flow rate 0.1 l/hr

9.5. Ground Gas Risk Assessment

Table 9.2 and Table 9.3 demonstrate how, in accordance with CIRIA C665, the periods and frequency of monitoring have been selected for the site.

Table 9.2 From Table 5.5a CIRIA C665 - Typical/idealised periods of monitoring (after Wilson et al, 2005)

	2	Generation Potential of the Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of development	Low (commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (flats)	2 months	3 months	6 months	12 months	24 months
	High (residential with gardens)	3 months[1]	6 months	6 months	12 months[1]	24 months

Notes:

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).

2 There is no industry consent over "high", "medium" or "low" generation potential of source.

Table 9.3 From Table 5.5b CIRIA C665 - Typical/idealised frequency of monitoring (after Wilson et al, 2005)

	2	Generation Potential of the Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of development	Low (commercial)	4	6	6	12	12
	Moderate (flats)	6	6	9	12	24
	High (residential with gardens)	6[1]	9	12	24[1]	24

Notes:

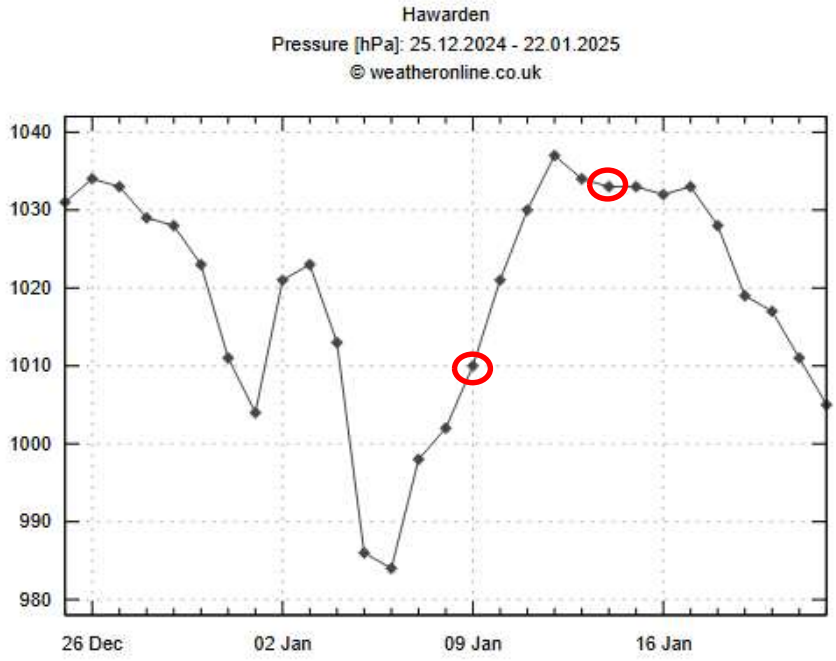
1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).

2 There is no industry consent over "high", "medium" or "low" generation potential of source.

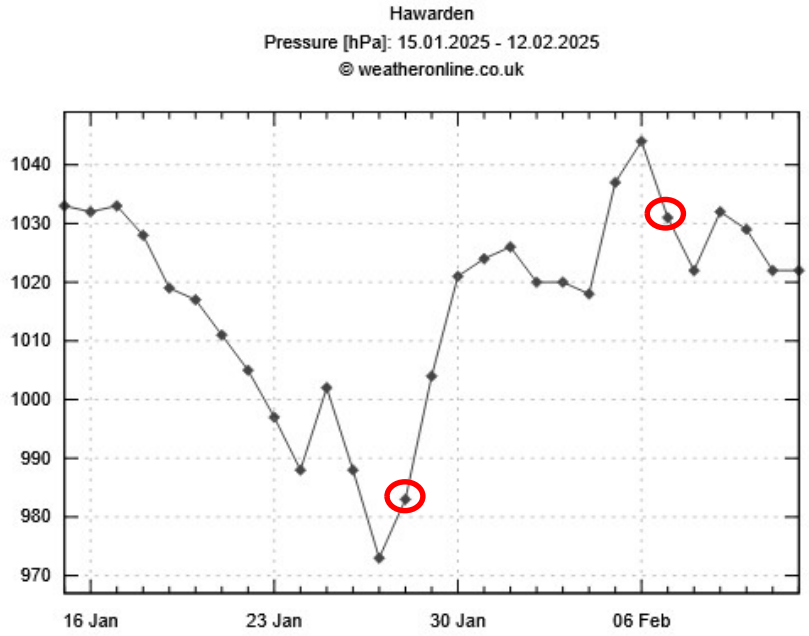
The total atmospheric pressure range of the ground gas monitoring data included in this report was between 993 mbar and 1027 mbar. This range covers low (<1000 mbar), moderate (1000 mbar to 1015mbar) and high (>1015 mbar) atmospheric pressures. Monitoring events included periods of stable and rising pressure trends.

The pressure graphs information is from the *nearest* available weather station (relative to the site) and therefore indicative of *regional* pressure trends. The below does not represent direct atmospheric pressure conditions on the site.

Visit 1 & 2 – 09/01/2025 & 14/01/2025



Visit 3 & 4 – 28/01/2025 & 07/02/2025



BS8576:2013 states that gas monitoring does not necessarily need to be carried out under worst case conditions. It does not necessarily need to be at low or falling atmospheric pressure, but rather should be continued until it is unlikely that additional data will change the interpretation of the

data, the outcome of the risk assessment and proposed remedial actions. One of the main considerations is to assess whether gas flow rates or concentrations could possibly increase and thereby affect the risk assessment and hence the choice of protective measures. This will be reviewed following completion of the final 2 No. proposed monitoring visits.

Consideration of Groundwater Effects

An assessment has been made to determine whether groundwater levels beneath the site lie at a shallow depth at, or above, the plain section of the monitoring well or within cohesive strata. In those instances where shallow groundwater is located within the plain section of the monitoring well pipe or within cohesive strata this can result in 'groundwater pumping' or a 'piston effect' where the measured peak (and in some cases steady) flow rates reported at these monitoring well locations are significantly (and artificially) influenced by the pressures formed in the void above the groundwater in the plain section of the pipe or within the pipework installed within cohesive strata, as opposed to being truly representative of the ground gas flow rates. In such instances, this scenario can create 'artificial' negative and /or relatively high peak positive readings depending on whether the groundwater levels have increased or decreased in between monitoring events or since installation of the monitoring wells.

In addition to the above, consideration has been made as to whether waterlogged ground or frozen ground conditions may have led to gas becoming trapped and then emitted into the monitoring wells causing a rapid gas release.

The results of gas monitoring have indicated the following instances where groundwater pumping is likely to have influenced the measured ground gas flow rates such that they may be reasonably discounted from the Gas Screening Value (GSV) calculation:

- Visit 1 – CP01 at 3.8 l/hr, CP10 at 13.3 l/hr, CP13 at 1.5 l/hr, CP14 at 1.5 l/hr, CP17 at 6.9 l/hr, WS03 at 3.7 l/hr, WS06 at 3.3 l/hr, WS12 at 2.0 l/hr
- Visit 2 – CP02 at 5.8 l/hr, CP03 at 14.3 l/hr, CP05 at 3.0 l/hr (peak and steady), CP10 at 4.8 l/hr, CP11 at 7.4 l/hr, CP12 at 3.2 l/hr, CP18 at 3.9 l/hr, WS02 at 6.0 l/hr, WS04 at 10.4 l/hr.
- Visit 3 – CP01 at 4.5 l/hr, CP02 at 6.7 l/hr, CP09 at 2.2 l/re, CP10 at 3.7 l/hr, CP14 at -12.2 l/hr, WS06 at -9.0 l/hr.
- Visit 4 – CP13 at -4.5 l/hr, CP17 at -8.7 l/hr, WS04 at -14.2 l/hr

The above instances were recorded where groundwater was measures within either the plain pipe section of the well or within clay soils in the slotted section of the well which act in a similar way due to the low permeability of the clay. Consideration has also been given to the recorded sub-artesian ground conditions encountered across site, whereby groundwater may be actively increasing within wells and therefore artificially elevating flow rates.

Taking all of the above into account, it is considered a flow rate of 0.4 l/ hr, the highest steady flow rate recorded, should be used for worst case GSV calculation.

The results of the ground gas monitoring have been assessed in accordance with the criteria specified for this site, which were derived as described in Appendix K.

Ground Gas Risk Assessment

Methodology

In accordance with Section 6.3.1 in BS 8485:2015 +A1:2019, the development of the GSV for the site or the zone follows a process in which:

1. borehole hazardous gas flow rates are calculated for each borehole standpipe for each monitoring event and included in a database;

2. the reliability of the measured gas flow rates and concentrations is assessed taking into account borehole construction, etc;
3. decisions are made as to whether to use peak gas flow rates or steady-state rates in each calculation;
4. decisions are made about how to deal with any temporal or spatial shortages in the data;
5. a decision is made about whether the site might be zoned or not; and
6. judgements are made about what GSV to use for design purposes taking all relevant information into account.

Subsequently to the above, the calculated borehole hazardous gas flow rates are considered to determine a Gas Screening Value (GSV) either for the site as a whole, or for site zones, if applicable.

Additionally, CIRIA C665 indicates that in the event that the reported methane concentrations are 'typically' >1% v/v and/or the reported carbon dioxide concentrations are 'typically' >5% then *consideration* should be made to increase the determination of the site to a Characteristic Situation 2 – Low Risk scenario.

'Worst-Case' GSV Check Calculation – Carbon Dioxide and Methane

In accordance with BS8485, Tier Environmental has conducted a 'worst-case' check by calculating the Gas Screening Value (GSV) for the site:

> *"Irrespective of the apparent comprehensiveness of the dataset, the plausible worst case condition should be calculated for each hazardous gas by multiplying the maximum recorded flow in any standpipe in that strata (and zone) with the maximum gas concentration in any other standpipe in that strata (and zone), but discounting any peak instantaneous flows and negative flows that have been judged to be unrepresentative of a possible worst case."*

Therefore, the following process has been followed:

- the maximum reported methane or carbon dioxide concentration (whichever is highest) from any monitoring well and during any ground gas monitoring visit; and,
- the remaining maximum peak positive flow rate (after any negative flow rates or 'artificially' high flow rates have been discounted as described above) from any monitoring well and during any ground gas monitoring visit.

Table 9.4 Worst-Case GSV Check Calculation

Ground Gas	Maximum Reported Peak Concentration (% v/v)		Selected Concentration used in GSV Calculation (% v/v)		Maximum Appropriately Selected Gas Flow Rate (l/hr)		'Worst case' GSV (l/hr)
Methane (CH_4)	0.2		5.6	X	0.4	=	0.0224
Carbon dioxide (CO_2)	5.6						

CIRIA C665 provides two separate methods to 'characterise' a site that firstly requires the assessor to distinguish between two fundamental development 'situations':

- **Situation A** - Any development other than Situation B (e.g. factories, shops, commercial, warehouses, schools, cinemas, sports centres, stadiums, high rise housing, housing with basements, etc) for which the **Modified Wilson and Card 'Characteristic Situation' classification system** is applied; and,
- **Situation B** - Low rise building with minimum ventilated under floor void (min 150mm) for which the **NHBC Traffic light classification system** is applied.

In this instance, as the site is due to be developed as a series of industrial units, it shall be regarded as a 'Situation A' scenario for the purposes of the ground gas risk assessment.

Table 9.4 demonstrates that the site is placed in a Characteristic Situation 1 – Very Low Risk scenario on the basis of the 'worst case' GSV alone.

CIRIA C665 indicates that in the event that the reported methane concentrations are *'typically'* >1% v/v and/or the reported carbon dioxide concentrations are *'typically'* >5% then consideration should be made to increase the determination of the site to a Characteristic Situation 2 – Low Risk scenario.

As the maximum reported carbon dioxide concentrations exceed these thresholds, Tier Environmental has conducted further consideration of whether the site should be classified as a Characteristic Situation 2 – Low Risk scenario below:

Measured peak concentrations of 5.2% v/v to 5.6% v/v were recorded within CP06 during the second and third visit respectively, and at 5.4% v/v in CP07 on the fourth visit. Given the localised nature of these elevation, and potential for this to associated with groundwater pumping, and the likely removal of viable on site source (infilled ponds and peat soils), it is not considered necessary to increase the characteristic situation for the site at this stage.

Carbon Monoxide and Hydrogen Sulphide

There is no current UK risk assessment guidance available for carbon monoxide and hydrogen sulphide derived from ground gases.

No measured concentrations of hydrogen sulphide have been reported in excess of the instrument's detection limit. As such, there is no evidence to suggest that the site presents a potential risk to future land users from hydrogen sulphide.

A maximum peak carbon monoxide concentration of 88 ppm has been reported which exceeds the workplace long term exposure limit (30ppm) and the WHO long term (24 hours) indoor exposure guideline value (5.68 ppm) but is below the workplace short term exposure limit (200ppm) published by the Health and Safety Executive (EH40/2005 Workplace Exposure Limits).

Carbon monoxide is typically associated with incomplete combustion, and there is no potential source identified on site. The measures peak concentrations do not correlate with any elevate carbon dioxide or hydrogen sulphide and it is possible these are driven by the contained system of the well as outlined above, which is subject to groundwater pumping.

Whilst at this stage it is not considered that carbon monoxide levels present a risk, this assessment will be updated following completion of the ground gas monitoring programme.

Consideration of Foundation Types and Floor Slab Design

BS 8485 states that deeper foundations can influence or change ground gas pathways and gas generation rates. This might be due to the creation or alteration of flow paths for existing ground gases or be the result of the introduction of oxygen at depth (e.g. in peaty soils) promoting the generation

of ground gas. The guidance states that the foundations adopted for a building can influence the generation of gas and/or the pathways through which the gas might move and thus impact on the gas protection measures required. This could be a result of changing the permeability of the underlying strata, possible changes to the groundwater regime and the creation of preferential pathways due to the proposed foundation solution.

The guidance also states that assumptions made during initial gas risk assessments, including gas flow rates, are re-evaluated during the design of the foundations for the building.

Tier Environmental has considered the proposed foundation types within the ground gas risk assessment. It should be noted that the proposed units are likely to be on vibro stone columns (VSCs). Given the likely removal of geotechnically unsuitable soils, inclusive of the localised Made Ground associated with infilled ponds, and peat/organic soils within the vicinity of TP17 and TP18, it is considered that VSCs would not create any preferential pathways beyond those identified within the CSM.

Considerations for Construction and Maintenance Workers

During engineering and construction activities, the ground gas data indicate that the following aspects are to be considered during the preparation of relevant site H&S plans, method statements and related documents, and appropriate working methods adopted:

- **Carbon dioxide concentrations in ground gas:** The measured CO2 concentrations in ground gas reported are elevated relative to background levels and could present an asphyxiation risk in excavations and other confined spaces. The Health & Safety Executive has published information defining safe occupational exposure levels for CO2 and the latest guidance must be consulted to determine whether the ground gas regime necessitates specific precautions during site works.
- **Carbon monoxide in ground gas:** The measured carbon monoxide concentrations in ground gas reported are elevated relative to background levels and could give rise to asphyxiation in confined spaces. Safe working methods should be adopted to mitigate this risk.

9.6. Radon Gas

The site lies within an area where between worst case 5% and 10% of properties are above the Action Level within the north of the site, with the southwest in a 3-5% area and southeast in a <1% area. On this basis, basic radon protection measures are required, likely in the form of a suitable DPM which will act as a radon gas barrier. A site specific radon assessment may re-evaluate the risk rating.

Currently, no basements or converted cellars / basements are proposed for the development and therefore no additional consideration of potential increased risk needs to be made; however, this should be revisited in the event that the proposals change to include for a basement.

10.REVISED CONCEPTUAL SITE MODEL AND GENERIC QUANTITATIVE RISK ASSESSMENT OF POLLUTANT LINKAGES

The preliminary combined conceptual site model and conceptual exposure model, developed from the desk study information and presented in Section 0, has been revised in light of the ground investigation and the chemical analysis results presented above in Table 10.1, below.

A revised qualitative risk assessment has also been made of the likelihood of the linkage operating and its potential significance in accordance with CIRIA C552.

Table 10.1 Revised Assessment of Potential Pollutant Linkages (Continued on Next Page).

Justification / Comments
• The site is covered in a veneer of topsoil to circa 0.30-0.35m bgl, and underlain in only a few locations by shallow Made Ground in the form of infilled ponds consisting of sand and gravel encountered from 0.30-1.55m bgl in TP17 and TP18. Natural soils of Glacial Till were recorded as soft to stiff clays/silts and loose to medium dense sands, to a maximum depth of 10.50m bgl in the Tier Environmental Investigation. It should also be noted that organic peat soils were recorded from 1.50-2.10m and 2.50-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays. These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation. • No measured concentrations of potential contaminants of concern have been reported in excess of the respective GACs protective of human health for a commercial/industrial land use. • Of the 22 No. topsoil and 2 No. Made Ground samples submitted for asbestos screening, 2 No. were reported to contain asbestos in WS04 and WS24 in the southwest and northwest respectively, in the form of chrysotile fibre bundles at <0.001% w/w. • Measured groundwater concentrations of copper and zinc have been reported in excess of the WQS protective of the controlled waters environment by either the same order of magnitude or one order of magnitude. Given the marginal nature of these exceedances, the potential for significant dilution between the site and any surface water bodies, the historical commercial / industrial heritage of the wider area surrounding the site, the potential for dilution with the groundwater body beneath the site to the more sensitive off site Principal Aquifer, the localised nature of those dissolved concentrations in excess of the WQS and the absence of any reported widespread concentrations, the fact that the site will incorporate buildings / hardstanding and a dedicated drainage system that shall reduce infiltration rates through the soils, and the absence of any nearby potable groundwater abstractions, these measured concentrations are not considered to pose a risk to the controlled waters environment. • A Gas Screening Value of 0.0224 l/hr has been calculated, derived using the maximum peak recorded carbon dioxide concentration of 5.6 %v/v and the maximum steady flow rate of 0.4 l/hr. Assessment of this gas screening value alone places the site in a Characteristic Situation 1 – Very Low Risk scenario in accordance with CIRIA C665 for which ground gas protection measures are not required. The results of carbon monoxide and hydrogen sulphide monitoring has determined elevate carbon monoxide levels though due to an absence of potential on site sources, sub artesian groundwater conditions, and widespread groundwater pumping across site wells, these levels are not considered to pose a risk. • The site lies within an area where between worst case 5% and 10% of properties are above the Action Level within the north of the site, with the southwest in a 3-5% area and southeast in a <1% area. On this basis, basic radon protection measures are required, likely in the form of a suitable DPM which will act as a radon gas barrier. A site specific radon assessment may re-evaluate the risk rating.

Source	Potential Contaminants of Concern	Pathway	Receptor	Consequence	Probability	Qualitative Risk Assessment
Localised asbestos in Made Ground as chrysotile fibre bundles at <0.001%	Asbestos	(Dust migration and) dust inhalation	Future site users (commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Adjacent site users (commercial)	Medium	Unlikely	Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	Likely	Moderate Risk
Radon area of worst case 5-10% in the north of the site	Radon	Inhalation (indoor and outdoor)	Future site users (commercial)	Medium	Low Likelihood	Moderate / Low Risk
			Adjacent site users (commercial)	Medium	Unlikely	Low Risk
			Construction, site investigation, demolition and future maintenance workers	Medium	Low Likelihood	Moderate / Low Risk
		Migration of hazardous ground gases from beneath the site to adjacent sites along services or other preferential conduits	Adjacent site users (commercial)	Medium	Unlikely	Low Risk

For definition of the terms used in the qualitative risk assessment, please see Appendix H.

11.PRELIMINARY WASTE MATERIALS CLASSIFICATION AND WASTE DISPOSAL ROUTE DETERMINATION

11.1. Introduction

If the site is to be redeveloped and materials are disposed off site, the material exported from the site to Landfill should be hauled by a register waste carrier in accordance with Duty of Care Regulations 1991 and the Hazardous Waste Regulations 2005.

There will be requirement for the waste producer to provide appropriate Waste Acceptance Criteria (WAC) testing of the Soils for disposal to ensure that the soils are appropriately classified and that the landfill is licensed to receive such soils. Mixing of hazardous and non-hazardous waste is not permitted. For any hazardous wastes, a consignment note shall be completed, signed, and retained by all parties involved. The consignment note shall state the volume of waste, a physical description of the material and statement of its chemical composition. The waste consignment notes shall be kept by the contractor for a period of at least two years. For non-hazardous wastes, a Waste Transfer Note (WTN) shall be completed. The WTN should be signed and a copies should be kept by the contractor for a period of at least two years. Finally, consignment notes and WTNs shall be shown to an enforcement officer from the local council or the Environment Agency, if asked.

Approach to Assessing Hazard Properties

Flammability and Oxidisability

For any samples flagged as possessing hazardous properties flammability and oxidisability, for which there are no thresholds, Tier Environmental has used professional judgment and on-site observations to decide whether the waste soil, as a whole, is likely to be flammable or oxidising. It should be noted that flammability/oxidisability alone are unlikely to result in a hazardous classification for waste soil.

Worst Case Metal Compounds

The choice of an appropriate worst case metal compound in soil has been made on the basis of the available lines of evidence. For example, if laboratory chemical analysis has demonstrated that no measured concentrations of hexavalent chromium have been reported in excess of the laboratory method detection limit, there it would be regarded as evidence of an absence of a soil source of hexavalent chromium. In such an instance, the worst case metal chromates may be replaced in favour of the next worst case metal compound.

pH

For samples that have been determined as hazardous based on pH alone and cement/concrete has been identified in the sample, Tier Environmental may assume that the high pH was due to the crushing process in the laboratory and is not representative of the waste as a whole. If further detailed determination of this is required then Tier Environmental recommend that such assessment is carried out on these results in a manner described in the AGS Waste Classification for Soils – A Practitioners' Guide (dated 2019):

- Consideration of the acid/alkali reserve to be conducted (as described in WM3 Appendix C4 and C8).
- If large enough, the cement/concrete fraction may be separated manually before testing. Waste concrete from construction and demolition which doesn't contain hazardous substances is non-hazardous (LoW code 17-01-01).
- If cement/concrete has been identified in the sample, a second analysis may be conducted on an 'as received' sample, avoiding the need for crushing before testing. The high pH is typically associated with the finer fractions of cement. If the 'as received' sample has an

acceptable pH, this provides additional confidence that the high pH was due to the crushing process and is not representative of the waste as a whole.

Asbestos

With respect to asbestos, If the waste contains fibres that are free and dispersed then the waste will be hazardous if the waste as a whole contains 0.1% w/w or more asbestos in accordance with WM3. If the waste contains any identifiable pieces of suspected asbestos containing material (i.e. any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye), then these pieces must be assessed separately. The waste is hazardous if the concentration of asbestos in the piece of asbestos containing material is 0.1% w/w or more. The waste shall then be regarded as a mixed waste and classified accordingly.

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

- 17 06 05* Construction material containing asbestos.
- 17 06 01* Insulation material containing asbestos.

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

Tier Environmental Geoenvironmental engineers hold up to date UKATA Asbestos Awareness training certificates in order to demonstrate 'competence' that is required as described in WM3.

Flammable Liquid Waste

Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As such, in those instances where materials are classified as hazardous based on this alone and no free phase product is encountered, it is considered that the materials may be regarded as being non-hazardous. Please note that the table below includes a column to show whether free phase product has been encountered within the sample location.

11.2. Preliminary Waste Materials Classification

Tier Environmental have assessed the chemical results in terms of basic waste characterisation of materials on site. This provides a preliminary assessment of whether a material is potentially non-hazardous or hazardous waste.

The results of this preliminary assessment are summarised in the following table.

Natural Soils / Bedrock

Representative samples of natural soils have been obtained during the investigation.

The results of basic waste characterisation are summarised in the table below. It is likely that any natural soils (that are not impacted by any known contamination from shallow Made Ground, or unexpected contamination) would be suitable for disposal to an inert waste landfill. It is recommended that the landfill is approached to confirm this position prior to off-site disposal. Otherwise, additional testing will be required to confirm the waste disposal route for natural soils beneath the site.

Table 11.1 Preliminary Materials Waste Classification

Exploratory Hole Location	Sample Depth (m bgl)	Simplified Description of the Sample	Basic Waste Characterisation Result	If 'Potentially Hazardous': Is it Possible to Demonstrate the Material is Non-Hazardous?	If the material is Hazardous – What is the Driver for Hazardous Waste Classification?	Asbestos Presence, Type and Quantification	WAC Sample Available?
WS01	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.	'Potentially hazardous' but can be downgraded to **non-hazardous** (see next column for details).	Yes. Driven by 'HP 3(i): Flammable "flammable liquid waste"' (hazard statement: Flam. Liq. 3; H226 "Flammable liquid and vapour."). However, Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As no free phase product was encountered, it is considered that the materials above may be regarded as being **non-hazardous**.	N/A	None detected	No
WS02	0.00-0.35	Topsoil: Dark brown slightly gravelly sandy Clay.	Non-Hazardous	N/A	N/A	None detected	No
WS03	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.	Non-Hazardous	N/A	N/A	None detected	No
WS05	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.	'Potentially hazardous' but can be downgraded to **non-hazardous** (see next column for details).	Yes. Driven by 'HP 3(i): Flammable "flammable liquid waste"' (hazard statement: Flam. Liq. 3; H226 "Flammable liquid and vapour."). However, Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As no free phase product was encountered, it is considered that the materials above may be regarded as being **non-hazardous**.	N/A	None detected	No
WS06	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.	Non-Hazardous	N/A	N/A	None detected	No
WS11	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.	'Potentially hazardous' but can be downgraded to **non-hazardous** (see next column for details).	Yes. Driven by 'HP 3(i): Flammable "flammable liquid waste"' (hazard statement: Flam. Liq. 3; H226 "Flammable liquid and vapour."). However, Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As no free phase product was encountered, it is considered that the materials above may be regarded as being **non-hazardous**.	N/A	None detected	No
WS12	0.00-0.35	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS13	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS14	0.00-0.35	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS16	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
TP17	0.90	Made Ground: Dark brown silty slightly gravelly Sand with organic odour.			N/A	None detected	No
TP17	1.60	Dark brown fibrous Peat	Hazardous	N/A	TPH (C6 to C40)	Not analysed for asbestos	No
TP18	1.50	Made Ground: Light yellowish brown slightly sandy/gravelly Clay.	'Potentially hazardous' but can be downgraded to **non-hazardous** (see next column for details).	Yes. Driven by 'HP 3(i): Flammable "flammable liquid waste"' (hazard statement: Flam. Liq. 3; H226 "Flammable liquid and vapour."). However, Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As no free phase product was encountered, it is considered that the materials above may be regarded as being **non-hazardous**.	N/A	None detected	No
TP18	2.80	Soft dark greyish brown Clay with organic odour.	Hazardous	N/A	TPH (C6 to C40)	Not analysed for asbestos	No
WS04	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.	'Potentially hazardous' but can be downgraded to **non-hazardous** (see next column for details).	Yes. Driven by 'HP 3(i): Flammable "flammable liquid waste"' (hazard statement: Flam. Liq. 3; H226 "Flammable liquid and vapour."). However, Tier Environmental consider that such a hazard property would apply if free phase product has been reported in the sample. As no free phase product was encountered, it is considered that the materials above may be regarded as being **non-hazardous**.	N/A	Chrysotile fibre bundles at <0.001% w/w	No
WS08	0.00-0.30	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS21	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS09	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS23	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS24	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	Chrysotile fibre bundles at <0.001% w/w	No
WS25	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
WS26	0.10	Topsoil: Dark brown slightly gravelly sandy Clay.			N/A	None detected	No
CP03	1.00	Soft light orangish brown slight silty Clay	Non-Hazardous	N/A	N/A	Not analysed for asbestos	No
CP04	0.80	Loose light orangish brown silty very gravelly Sand.	Non-Hazardous	N/A	N/A	Not analysed for asbestos	No
CP09	0.90	Stiff dark orangish brown slightly gravelly sandy Clay	Non-Hazardous	N/A	N/A	Not analysed for asbestos	No
CP13	1.00	Soft light orangish brown slight silty Clay	Non-Hazardous	N/A	N/A	Not analysed for asbestos	No
CP15	0.80	Light orangish brown slightly gravelly/clayey Sand.	Non-Hazardous	N/A	N/A	Not analysed for asbestos	No

11.3. Materials Re-Use

Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials may be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). Please note that any previously landfilled or mining waste materials may not be appropriately subject to consideration under DoWCoP and may not be re-used under DoWCoP unless sufficient lines of evidence and agreement with the local Environment Agency Waste Team can be sought beforehand.

Re-Use of Excavated and Stockpiled Clean Naturally Occurring Soils on Other Sites

In addition, Tier Environmental are aware that CL:AIRE is classing stockpiled clean, naturally occurring soils as waste, unless their final destination is identified in a Materials Management Plan, before they are excavated. However, Tier Environmental consider that any clean naturally occurring soils arising from enabling works, earthworks or construction activities would be regarded as an asset and the default assumption for this site (prior to excavation and stockpiling) is not the intention to discard these materials where they may be reasonably re-used on this, or another, development site. Stockpiling is a recognised, recommended means of safely storing soils. Whilst there may be advantages to leaving soils in-situ, stripping topsoil and subsoil prior to earthworks is a routine construction activity. Tier Environmental consider that it is not unreasonable to state that in the event that the developer owns another site where the construction phase is ongoing, soils can be transferred between their sites as an owned product and never become waste.

The above paragraph above is therefore considered a clear intention to reuse any clean, naturally occurring soils derived from excavations at this site (which may also include temporary stockpiling these materials). It is considered; however, that in addition to this the following must be adhered to:

- Reuse does need to occur within a ‘reasonable’ timeframe (12 No. months); and,
- If soils are transferred to a third party (another developer), there needs to be some contractual agreement in place, as in this situation it is important to have something in place confirming that surplus soils are required by the third party.

Re-Use of Excavated and Stockpiled Clean Naturally Occurring Soils Within The Site They Are Excavated From

Further to the above, where soils are naturally occurring, uncontaminated and re-used on the site they are excavated from, they fall outside of the Waste Framework Directive (WFD) i.e. they will not be classified as a waste Currently the CL:AIRE Definition of Waste Code of Practice states the following which appears to support this position: *“If the material is waste an Environmental Permit will be required to lawfully deposit or re-use it unless the material is “uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated”, which is excluded from waste regulation by the Waste Framework Directive (2008).”*

12.CONCLUSIONS AND RECOMMENDATIONS

12.1. Conclusions

- Historically, the site has been a farm and has remained in agricultural use since at least the 1870s with a number of drainage channels and ponds located on-site. From the early-1900s to the 1960s the site was labelled as a Sewage Farm, and it is understood the site acted as an outfall for sewage from the adjacent Five Fords Wastewater Treatment Facility.
- The surrounding area is predominately characterised by agricultural land; however, a number of commercial and industrial units are located to the north-east of the site associated with Wrexham Industrial Estate and to the west of the site associated with Five Fords Wastewater Treatment Facility. Potentially contaminative uses within the surrounding area have included the railway adjacent to the south of the site (c. 1890s to 1970s) and mineral railway 200 m north-east (c. 1940s to 1970s), which served Wrexham Industrial Estate located up to 250 m north-east of the site, as well as the Five Fords Wastewater Treatment Facility up to 50 m west of the site (c. early-1900s to present).
- Topsoil was encountered at all intrusive investigation locations to between 0.25m and 0.50m bgl. Made Ground was encountered at within TP17 and TP18 to depths typically between 0.30m and 1.55m bgl comprising both cohesive and granular materials with anthropogenic including plastic, brick, ceramic and tile. Made Ground corresponds to historically infilled ponds.
- Cohesive and locally granular superficial Glacial Till deposits were encountered across the site to the maximum drilled depth of 10.45m bgl. It should also be noted that organic peat soils were recorded from 1.50-2.10m and 2.50-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays. These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation.
- It should also be noted that organic peat soils were recorded from 1.50-2.10m and 2.50-2.70m within TP17 and TP18 respectively, underlain by further soft organic clays. These soft and geotechnically unsuitable soils should be removed as part of earthworks and replaced with re-engineered fill. Further areas of soft soils are anticipated in other historic pond locations which may not have been intercepted during this investigation.
- Groundwater levels were recorded between 1.20m and 7.00m bgl during fieldworks. In several locations the level was noted to increase either slightly or significantly, in some cases to near or at ground level such as CP01, CP05, TP01, TP02, TP04 and WS17. This generally indicated possible sub-artesian conditions across site. whilst groundwater was not recorded to overflow above ground level, possible artesian conditions could be created following regrading works and this should be considered within the drainage scheme. Groundwater levels during monitoring were recorded generally within the top 2.0m of ground, locally at circa 3.0m bgl in CP03 indicating a general shallow groundwater level across the entire site within the Till.
- Given the encountered ground conditions, with localised soft (<40kPa) clay soils in a number of locations between 1.20-6.00m bgl, and variable loose granular soils, and taking in account the nature of the proposed development and initial discussions with specialist contractors, the most economic foundation solution is likely to be ground improvement, such as rigid inclusions/CMCs or vibro stone columns supporting pad foundations. This would be adopted for the entire structure, dependent upon the design requirements and economic feasibility. Vibro Menard suggested that vibro stone columns could be utilised beneath the foundations and slabs dependant on the required load for a bearing capacity of 150kPa.
- It is considered that a Design Sulphate Class of DS-1 and ACEC Class AC-1s is appropriate for buried concrete at the site.
- The site falls within a Phosphorus Sensitive SAC Freshwater catchment area associated with the River Dee. As such, due consideration during drainage strategy / design should be given with respect to this designation and any mitigation / avoidance measures.
- No measured soil concentrations of potential contaminants of concern have been reported in excess of Generic Assessment Criteria (GACs) protective of human health appropriate to the proposed land use. Of the 22 No. topsoil and 2 No. Made Ground samples submitted for

asbestos screening, 2 No. were reported to contain asbestos in WS04 and WS24 in the southwest and northwest respectively, in the form of chrysotile fibre bundles at <0.001% w/w.

- Superficial deposits (Glacial Till) are classified as a Secondary Undifferentiated Aquifer and the bedrock (Salop Formation) is classified as a Secondary A. The site is not located within an area covered by a Source Protection Zone and no active potable/ non-potable water abstractions are present in the site's vicinity. The site is set within an area of significant wider historical commercial/industrial heritage. On this basis the controlled waters sensitivity for the Secondary A/Principal Aquifer is regarded as being low. The conclusion of an assessment carried out on groundwater results has determined that the site does not present a significant risk to the controlled water environment.
- A Gas Screening Value of 0.0224 l/hr has been calculated, derived using the maximum peak recorded carbon dioxide concentration of 5.6% v/v and the maximum steady flow rate of 0.4 l/hr. Assessment of this gas screening value alone places the site in a Characteristic Situation 1 – Very Low Risk scenario in accordance with CIRIA C665 for which ground gas protection measures are not required. The results of carbon monoxide and hydrogen sulphide monitoring has determined elevate carbon monoxide levels though due to an absence of potential on site sources, sub artesian groundwater conditions, and widespread groundwater pumping across site wells, these levels are not considered to pose a risk.
- The site lies within an area where between worst case 5% and 10% of properties are above the Action Level, though this is within the north of the site only. The remainder of the site falls within a 3-5% or <1% area. On this basis, basic radon protection measures are required, likely in the form of a suitable DPM which will act as a radon gas barrier. In addition to the above, basements represent areas that are more at risk because the walls are in contact with the ground as well as the floor. This, coupled with reduced natural ventilation below ground level, increases the risk of elevated radon levels. All basements are therefore considered under BR 211 to be at increased risk of elevated levels of radon regardless of geographic location. Currently, no basements or converted cellars / basements are proposed for the development and therefore no additional consideration of potential increased risk needs to be made; however, this should be revisited in the event that the proposals change to include for a basement.
- A sewer main cuts northwest/south east through the south of the site.
- Basic waste characterisation has determined that Made Ground soils are non-hazardous aside from peat soils in TP17 at 1.60m bgl, and organic clay soils in TP18 at 2.80m bgl which are both considered hazardous due to elevated TPH compounds. WAC testing has not been completed as part of this investigation. It is anticipated that the majority of non-organic natural soils will be suitable for disposal to an inert landfill.

12.2. Recommendations

- Detailed Quantitative Risk Assessment to confirm the suitably of the reuse of the asbestos containing Topsoil locally identified in the northwest and southwest of the site.
- Confirmation of the route of the sewer that traverses the southern area of the site (Tier is currently liaising with Welsh Water to agree methodology).
- Installation of basic radon protection measures.
- Decommissioning of monitoring wells with bentonite cement grout to remove preferential pathways for artesian and sub-artesian groundwater to affect the proposed enabling works and development.
- Bench trials to confirm the suitability of modifying and stabilising site won fill with lime/cement.
- Materials Management Plan or U1 Exemption for the reuse on any site won Made Ground.
- Confirmation that WRAP Protocol has been followed for all imported recycled aggregates.

13.REGULATORY APPROVALS

The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other organisations for their comment and approval prior to undertaking any works on site.

It is recommended that conditions placed on any planning permission are discharged prior to commencement of site works.

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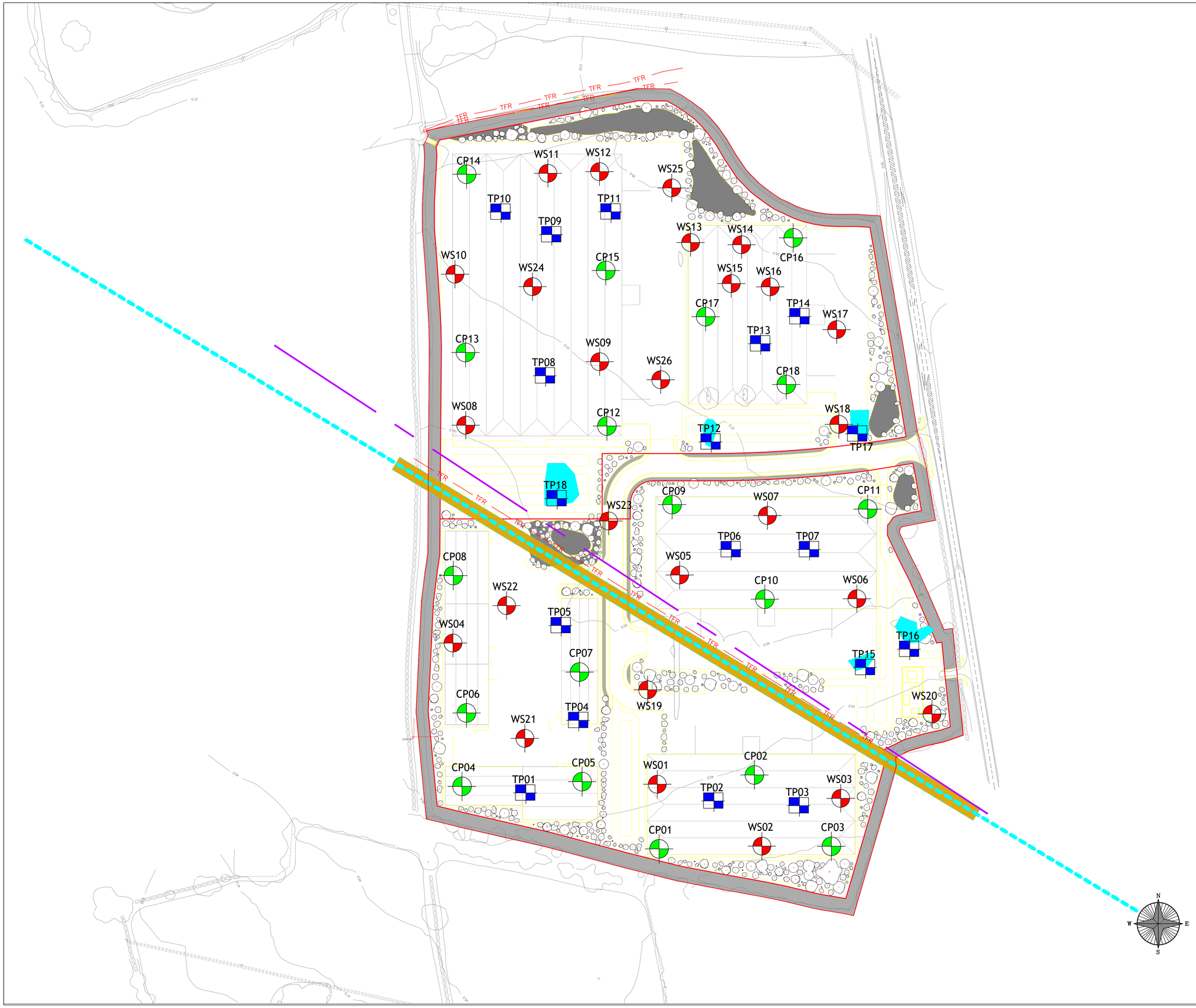
BGS Geology of Britain Viewer http://mapapps.bgs.ac.uk/geologyofbritain/home.html

15.GLOSSARY OF TERMS

ACEC	Aggressive Chemical Environment for Concrete (classification)
aOD	Above Ordnance Datum
bgl	Below ground level
BGS	British Geological Survey
BRE	Building Research Establishment
CBR	California Bearing Ratio (test)
COMAH	Control of Major Accident Hazards (regulations)
Designated location	Site (and the ecosystem on that site) protected under national of international legislation. A potential ecological receptor to be considered as part of the assessment of land contamination. Example designated locations include SSSIs (q.v.), SACs (q.v.), national nature reserves, Ramsar sites and bird special protection areas.
DQA	Data Quality Assessment
DQO	Data Quality Objective
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standard
EQS	Environmental Quality Standard
GAC	Generic Assessment Criterion
GQA	General Quality Assessment (Environment Agency)
GSV	Gas Screening Value
HCV	Health Criteria Value
IPPC	Integrated Pollution Prevention and Control (regulations)
K_{ow}	Octanol-water partition coefficient
LEL	Lower Explosive Limit
LL	Liquid Limit
LoD	Limit of Detection (analytical)
LoQ	Limit of Quantification (analytical)
Mean Value Test	Statistical test (described in the CIEH Guidance) to estimate the mean value of a normally distributed population of data at a given level of confidence. Normally for contaminated land assessment, the 95th percentile (referred to as the 95%UCL or US95) is applied as a reasonable but conservative estimate of the mean concentration for comparison with the relevant assessment criteria.
Maximum Value Test	Statistical test (described in the CIEH Guidance) to identify whether an elevated concentration within a normally distributed data set forms part of the underlying population from which it has been sampled or whether it is an outlier (such as a localised area of contamination) that merits further consideration.
MC	Moisture Content
NGR	National Grid Reference
NIHHS	Notification of Installations Handling Hazardous Substances (regulations)
OS	Ordnance Survey
PI	Plasticity Index
PID	Photoionisation Detector
PL	Plastic Limit
ppm	Parts per million
ppmv	Parts per million by volume
QA	Quality Assurance
QC	Quality Control
SAC	Special Area of Conservation
SOM	Soil Organic Matter

SPT	Standard Penetration Test
SPZ	Source Protection Zone (see Appendix J)
SSAC	Site-Specific Assessment Criterion
SSSI	Site of Special Scientific Interest
SVOC	Semi-Volatile Organic Compound
TEF	Toxicity Equivalent Factor
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average
US95	95th percentile estimate of the true mean value of a data population (also known as 95%UCL).
VOC	Volatile Organic Compound

APPENDIX A - DRAWINGS



DO NOT SCALE

NOTES

- CABLE PERCUSSION BOREHOLE
- WINDOW SAMPLE
- TRIAL PIT
- APPROXIMATE LOCATION OF HISTORIC PONDS BASED ON THIRD PARTY DESK STUDY
- APPROXIMATE SEWER LOCATION BASED ON INFORMATION PROVIDED BY WELSH WATER
- TFR — APPROXIMATE SEWER LOCATION TRACED BY MIDLAND SURVEY USING GPR ON 03.12.2024
- APPROXIMATE TRENCH SCAR IDENTIFIED ON GOOGLE EARTH

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	18.12.2024	CS	ISSUED FOR INFORMATION	SL	SL

DRAWING STATUS: INFORMATION

Tier Environmental Ltd.
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Chester Business Park
Chester | CH4 9QZ

t: 01925 818 388

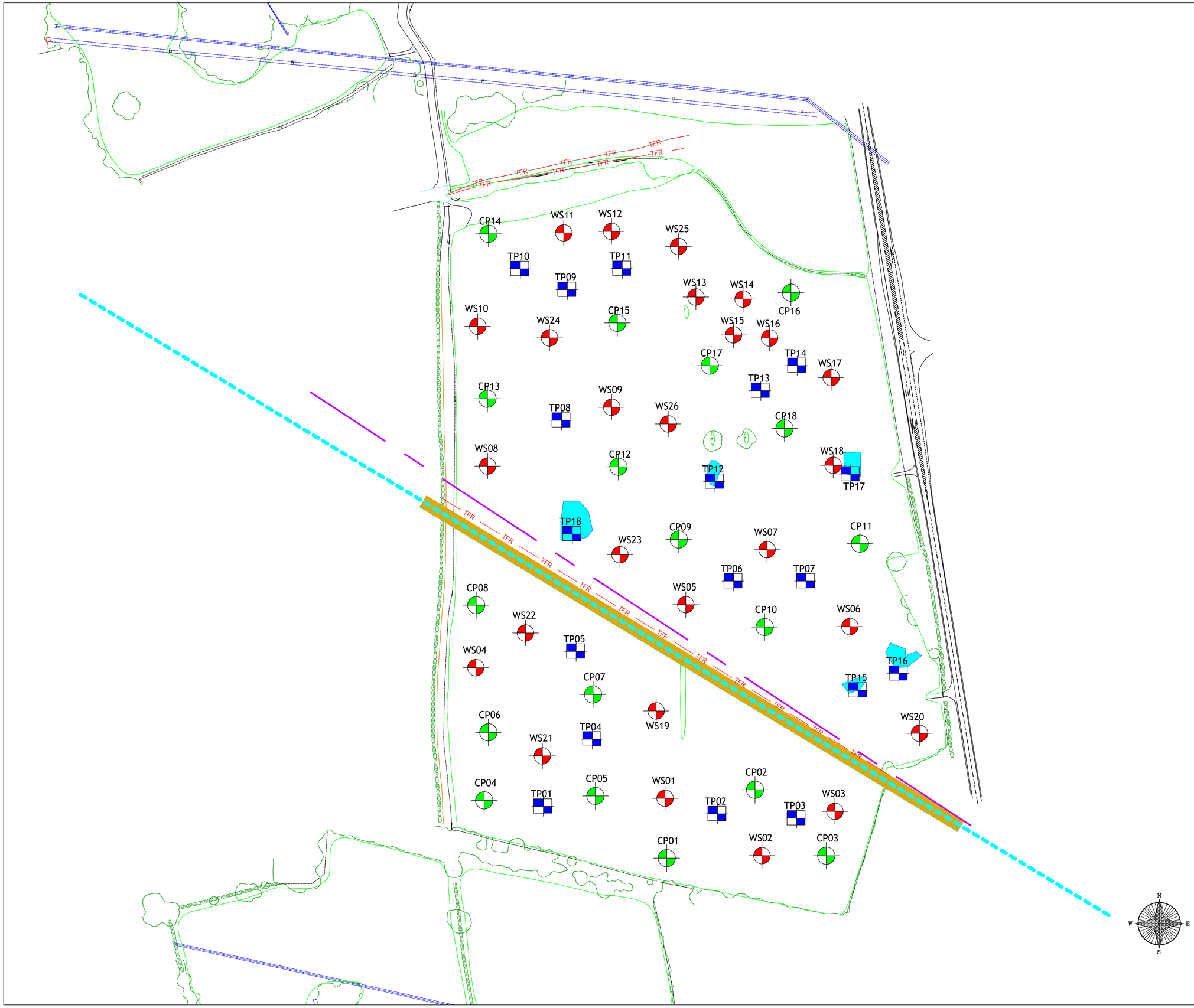
CLIENT: NET WORLD SPORTS

PROJECT: PLOT 2 MARCHWIEL WREXHAM

TITLE: EXPLORATORY HOLE LOCATION PLAN

SCALE @ SIZE:	CHECKED:	APPROVED:
NTS	SL	SL
CAD FILE:	DESIGN/DRAWN:	DATE:
–	CS	18/12/2024

PROJECT No:	DRAWING No:	REV:
TE1890	TE1890-TE-00-XX-DR-GE-005-V03	P3



DO NOT SCALE

NOTES

- CABLE PERCUSSION BOREHOLE
- WINDOW SAMPLE
- TRIAL PIT
- APPROXIMATE LOCATION OF HISTORIC PONDS BASED ON THIRD PARTY DESK STUDY
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- APPROXIMATE TRENCH SCAR IDENTIFIED ON GOOGLE EARTH

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	18/12/2024	CS	ISSUED FOR INFORMATION	SL	SL

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CLIENT:

NET WORLD SPORTS

PROJECT:

PLOT 2 MARCHWIEL WREXHAM

TITLE:

TOPO EXPLORATORY HOLE LOCATION PLAN

SCALE @ SIZE:	CHECKED:	APPROVED:
NTS	SL	SL
CAD FILE:	DESIGN/DRAWN:	DATE:
–	CS	18/12/2024

PROJECT No:	DRAWING No:	REV:
TE1890	TE1890-TE-00-XX-DR-GE-006-V03	P3



DO NOT SCALE

NOTES

APPROXIMATE SEWER LOCATION BASED ON INFORMATION PROVIDED BY WELSH WATER

TFR — APPROXIMATE SEWER LOCATION TRACED BY MIDLAND SURVEY USING GPR ON 03.12.2024

APPROXIMATE TRENCH SCAR IDENTIFIED ON GOOGLE EARTH

REV	DATE	BY	DESCRIPTION	CHK	APD
P1	11/12/2024	CS	ISSUED FOR INFORMATION	SL	SL

DRAWING STATUS: INFORMATION

Tier Environmental Ltd.
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t: 01925 818 388

CLIENT: NET WORLD SPORTS

PROJECT: PLOT 2 MARCHWIEL WREXHAM

TITLE: APPROXIMATE SEWER LOCATION

SCALE @ SIZE:	CHECKED:	APPROVED:
NTS	SL	SL
CAD FILE:	DESIGN/DRAWN:	DATE:
–	CS	11/12/2024

PROJECT No:	DRAWING No:	REV:
TE1890	TE1890-TE-00-XX-DR-GE-004-V02	P2

APPENDIX B - EXPLORATORY HOLE LOGS

Borehole Log

Borehole No. **CP01**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336946.68 - 347684.97	Hole Type CP
Location: Wrexham		Level: 43.73	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	43.43		Medium dense, dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		1.00	D					Stiff, dark reddish brown, mottled grey, slightly sandy, silty CLAY. TILL
		1.20 1.20 - 1.65	SPTL S	N=18 (2,2/3,4,5,6)				
	▼	2.20 2.20 - 2.85	SPTL S	N=15 (3,3/3,4,4,4)	2.70	41.03		Stiff, dark reddish brown, mottled grey, slightly sandy, silty CLAY. TILL
		3.20 3.20 - 3.85	SPTL S	N=18 (3,3/4,4,5,5)				*Becoming firm between 3.70m and 6.00n*
		4.40 - 4.85	U					
		4.90	D					

1 2 3 4 5

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) Groundwater encountered at 1.80m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP01**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336946.68 - 347684.97	Hole Type CP
Location: Wrexham		Level: 43.73	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 5.50 - 5.95	SPTL S	N=21 (2,3/5,5,5,6)				
		6.50 - 6.95	U					
		7.00	D					
		7.50 7.50 - 8.05	SPTL S	N=19 (3,4/4,5,5,5)				
		8.70 8.70 - 9.15	SPTL S	N=20 (4,4/4,5,6,5)				
		10.00		N=22 (4,4/5,5,6,6)				

Continued on next sheet

6 7 8 9 10

Remarks

1) Hand dug pit to 1.20m 2) Groundwater encountered at 1.80m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP01**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336946.68 - 347684.97	Hole Type CP
Location: Wrexham		Level: 43.73	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.45	SPTL S		10.45	33.28		End of borehole at 10.45 m

Remarks

1) Hand dug pit to 1.20m 2) Groundwater encountered at 1.80m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP02**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337025.52 - 347746.08	Hole Type CP
Location: Wrexham		Level: 42.80	Scale 1:25
Client: Net World Sports		Dates: 10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.30	42.50		Soft, dark brown, slightly silty CLAY with rare rootlets. TOPSOIL
		1.00	D					Loose, orangish brown, slightly clayey, fine to medium SAND TILL
		1.20		N=8 (1,2/2,2,2,2)				
		1.20 - 1.65	SPTLS					
		2.00	D		2.00	40.80		Stiff, dark orangish brown, slightly silty, slightly sandy CLAY. TILL
		2.00		N=15 (2,3/3,4,4,4)				
		2.00 - 2.45	SPTLS					
		3.00 - 3.45	U					
		3.50	D					
		4.00		N=8 (2,2/2,2,2,2)				*Becoming firm at 4.00m*
		4.00 - 4.45	SPTLS					
		5.00	D					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at final depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled

Borehole Log

Borehole No. **CP02**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337025.52 - 347746.08	Hole Type CP
Location: Wrexham		Level: 42.80	Scale 1:25
Client: Net World Sports		Dates: 10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.00 - 5.45	U						
		5.50	D						
		6.00		N=8 (1,2/2,2,2,2)	6.00	36.80			
		6.00 - 6.45	SPTL S					Soft, dark greyish brown, slightly silty CLAY. TILL	6
		7.00	D						
		7.00		N=8 (2,2/2,2,2,2)					7
		7.00 - 7.45	SPTL S						
		8.00	D						
		8.00		N=10 (2,2/2,3,3,2)					8
		8.00 - 8.45	SPTL S						
		9.00	D						
		9.00		N=14 (2,2/3,3,4,4)					9
		9.00 - 9.45	SPTL S					*Becoming firm at 8m*	
		10.00	D						10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at final depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled

Borehole Log

Borehole No. **CP02**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337025.52 - 347746.08	Hole Type CP
Location: Wrexham		Level: 42.80	Scale 1:25
Client: Net World Sports		Dates: 10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 10.00 - 10.45	SPTL S	N=15 (2,3/3,4,4,4)	10.45	32.35		End of borehole at 10.45 m

11

12

13

14

15

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at final depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled

Borehole Log

Borehole No. **CP03**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337089.16 - 347687.11	Hole Type CP
Location: Wrexham		Level: 45.23	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.40	44.83		Dark brown, silty CLAY with rare rootlets. TOPSOIL	
		0.50	D					Soft, light orangish brown, slightly silty CLAY TILL	
		1.00	D						1
		1.00	ES						
		1.20		N=7 (1,2/2,1,2,2)					
		1.20 - 1.65	SPTL S						
		2.00	D						2
		2.00 - 2.45	U						
		2.50	D						
		3.00	D		3.00	42.23		Stiff, light orangish, mottled greyish brown, slightly silty CLAY. TILL	3
		3.00		N=17 (3,3/4,5,4,4)					
		3.00 - 3.45	SPTL S						
		4.00	D						4
		4.00		N=16 (3,3/4,4,4,4)					
		4.00 - 4.45	SPTL S						
		5.00 - 5.45	U						5
								Continued on next sheet	

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP03**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337089.16 - 347687.11	Hole Type CP
Location: Wrexham		Level: 45.23	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.50	D						
		6.00	D						6
		6.00		N=17 (3,3/3,4,5,5)					
		6.00 - 6.45	SPTL S						
		7.00	D						7
		7.00		N=19 (3,4/4,5,5,5)					
		7.00 - 7.45	SPTL S						
		8.00		N=23 (4,5/5,6,6,6)					8
		8.00 - 8.45	SPTL S						
		8.50	D						
		9.00 - 9.45	U						9
		9.50	D					*Becoming very stiff at 9.50m bgl.*	
		10.00	D						10
								Continued on next sheet	

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP03**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337089.16 - 347687.11	Hole Type CP
Location: Wrexham		Level: 45.23	Scale 1:25
Client: Net World Sports		Dates: 11/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 10.00 - 10.45	SPTL S	N=31 (5,6/7,7,8,9)	10.45	34.78		End of borehole at 10.45 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP04**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336783.68 - 347736.60	Hole Type CP
Location: Wrexham		Level: 41.98	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.50	41.48		Soft, dark brown, slightly sandy, silty CLAY. Sand is fine to coarse with rare rootlets. TOPSOIL
		0.80	ES					Loose, light orangish brown, silty, very gravelly, fine to coarse SAND. Gravel is subrounded to rounded, fine to coarse, iron rich sandstone, quartz and sandstone. TILL
		1.00	D					
		1.20		N=10 (2,3/2,3,2,3)				
		1.20 - 1.65	SPTLS					
		2.00	D		1.90	40.08		Stiff, dark brown, mottled grey, silty, slightly sandy CLAY. Sand is fine. TILL
		2.00		N=24 (4,5/6,6,6,6)				
		2.00 - 2.45	SPTLS					
		3.00 - 3.45	U					
		3.50	D					
								becoming firm at 3.8m bgl.
		4.00	D					
		4.00		N=10 (2,3/2,3,2,3)				
		4.00 - 4.65	SPTLS					
		5.00	D					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No. **CP04**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336783.68 - 347736.60	Hole Type CP
Location: Wrexham		Level: 41.98	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.00 5.00 - 5.45	SPTL S	N=12 (2,3/3,3,3,3)					
		6.00 - 6.45	U						6
		7.00 7.00 7.00 - 7.45	D SPTL S	 N=13 (3,3/3,3,3,4)					7
		8.00 8.00 8.00 - 8.45	D SPTL S	 N=10 (1,2/2,3,2,3)					8
		9.00 9.00 9.00 - 9.45	D SPTL S	 N=9 (2,2/3,2,2,2)					9
		10.00	D						10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No.
CP04
Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336783.68 - 347736.60	Hole Type CP
Location:	Wrexham		Level:	41.98	Scale 1:25
Client:	Net World Sports		Dates:	12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 10.00 - 10.45	SPTL S	N=9 (2,3/2,3,2,2)	10.45	31.53		End of borehole at 10.45 m

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Remarks
1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No. **CP05**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336883.01 - 347740.53	Hole Type CP
Location: Wrexham		Level: 41.65	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D					Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
					0.40	41.25		
		0.60	D					Stiff, light orangish brown, slightly silty sandy CLAY. Sand is fine TILL
					1.00	40.65		
		1.20 1.20 - 1.65	SPTL S	N=20 (2,3/5,5,5,5)				Stiff, dark brown, slightly silty, slightly sandy, very gravelly CLAY. Sand is fine to medium, gravel is subrounded to rounded, fine to medium of mudstone and quartz. TILL
					2.00	39.65		
	▼	2.20 2.20 - 2.65	SPTL S	N=12 (2,2/3,3,3,3)				Medium dense, dark brown, slightly silty clayey SAND. Sand is fine to medium. TILL
		3.20 3.20 - 3.65 3.40	SPTL S D	N=15 (2,3/3,4,4,4)	3.20	38.45		Firm, brown, slightly silty, sandy CLAY. Sand is fine. TILL
		4.30 - 4.75	U		4.30	37.35		Firm to stiff, light brown, silty CLAY. Sand is fine. TILL
	▼	4.80	D					
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.30m and 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP05**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336883.01 - 347740.53	Hole Type CP
Location: Wrexham		Level: 41.65	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.60 5.60 - 6.05	SPTL S	N=13 (2,2/3,3,3,4)				
		6.60 6.60 - 7.05	SPTL S	N=15 (4,3/3,4,4,4)				
		7.70 7.70 - 8.15	SPTL S	N=19 (3,3/4,5,5,5)				
		9.00 - 9.45	U					
		9.50	D					

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.30m and 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP05**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336883.01 - 347740.53	Hole Type CP
Location: Wrexham		Level: 41.65	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.30 10.30 - 10.75	SPTL S	N=16 (3,3/3,4,4,5)	10.75	30.90		End of borehole at 10.75 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.30m and 5.00m bgl as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP06**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336787.42 - 347797.34	Hole Type CP
Location: Wrexham		Level: 41.43	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.40	41.03		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		1.00	D					Loose, light orangish brown, silty, very gravelly, fine to coarse SAND. Gravel is subrounded to rounded, fine to coarse, iron rich sandstone, quartz and sandstone. TILL
		1.20						
		1.20 - 1.65	SPTLS	N=10 (2,3/3,2,3,2)				
		2.00	D		2.00	39.43		Soft, light brown slightly silty, sandy CLAY. Sand is fine. TILL
		2.00						
		2.00 - 2.45	SPTLS	N=7 (1,2/2,1,2,2)				
		3.00	D		2.50	38.93		Firm to stiff, light brown, mottled grey, silty CLAY. TILL
		3.00						
		3.00 - 3.45	SPTLS	N=11 (1,2/2,3,3,3)				
		4.00 - 4.45	U					
		4.50	D					
		5.00	D					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m as slight seepage. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No. **CP06**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336787.42 - 347797.34	Hole Type CP
Location: Wrexham		Level: 41.43	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00		N=12 (2,3/3,3,3,3)				
		5.00 - 5.45	SPTL S					
		6.00 - 6.45	U					
		6.50	D					
		7.00		N=15 (3,3/3,4,4,4)				
		7.00 - 7.45	SPTL S					
		8.00	D					*becoming stiff at 8.00m bgl*
		8.00		N=17 (5,5/4,4,4,5)				
		8.00 - 8.45	SPTL S					
		9.00	D					
		9.00		N=20 (5,4/5,5,5,5)				
		9.00 - 9.45	SPTL S					
		10.00		N=22 (3,4/5,6,5,6)				

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m as slight seepage. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No. **CP06**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336787.42 - 347797.34	Hole Type CP
Location: Wrexham		Level: 41.43	Scale 1:25
Client: Net World Sports		Dates: 12/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.45	SPTL S		10.45	30.98		End of borehole at 10.45 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m as slight seepage. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m

Borehole Log

Borehole No. **CP07**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336880.90 - 347831.16	Hole Type CP
Location: Wrexham		Level: 40.56	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	40.26		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		0.50	D					Firm, light orangish brown, slightly silty, slightly gravelly, sandy CLAY. Sand is fine to medium, gravel is subrounded to rounded, fine to coarse iron rich sandstone, mudstone and quartz. TILL
		1.20 1.20 - 1.65	SPTL S	N=12 (1,2/3,3,3,3)				
		2.20 2.20 - 2.65	SPTL S	N=14 (2,2/3,3,4,4)	2.20	38.36		Firm, light brown silty CLAY TILL
		3.20 3.20 - 3.65	SPTL S	N=10 (1,2/2,2,3,3)				
		3.50	D					
		4.40 4.40 - 4.85	SPTL S	N=15 (2,2/3,3,4,5)	4.20	36.36		Firm to stiff, light brown mottled grey silty CLAY. TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.50m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP07**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336880.90 - 347831.16	Hole Type CP
Location: Wrexham		Level: 40.56	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.70 5.70 - 6.15	SPTL S	N=13 (2,2/3,3,3,3,4)				
		6.50 - 6.95	U					
		7.00	D					*becoming stiff at 7.00m bgl*
		7.60 7.60 - 8.05	SPTL S	N=17 (2,3/4,4,4,5)				
		8.70 8.70 - 9.15	SPTL S	N=18 (3,3/4,4,5,5)				
		9.70 - 10.15	U					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.50m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No.
CP07
Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336880.90 - 347831.16	Hole Type CP
Location:	Wrexham		Level:	40.56	Scale 1:25
Client:	Net World Sports		Dates:	13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.20	D		10.20	30.36		End of borehole at 10.20 m

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Remarks
1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.50m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

AGS

Borehole Log

Borehole No. **CP08**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336776.52 - 347910.92	Hole Type CP
Location: Wrexham		Level: 41.31	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.40	40.91		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		1.00	D					Loose, dark yellowish brown, very silty, clayey, fine to medium SAND. Becoming slightly gravelly at 1.60m. Gravel is fine to medium, subrounded to rounded of sandstone, mudstone and quartz. TILL
		1.20 1.20 - 1.65	SPTL S	N=8 (2,2/2,2,2,2)				
		2.00 2.00 - 2.45	D U		2.00	39.31		Soft to firm, dark brown mottled grey silty CLAY TILL
		2.50	D					
		3.00 3.00 3.00 - 3.45	D SPTL S	N=7 (1,2/2,1,2,2)				
		4.00 4.00 4.00 - 4.45	D SPTL S	N=9 (2,2/2,3,2,2)				
		5.00 - 5.45	U		4.50	36.81		Firm, greyish brown, silty CLAY with occasional sand lenses. TILL

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.20m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Cased to 7.50m

Borehole Log

Borehole No. **CP08**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336776.52 - 347910.92	Hole Type CP
Location: Wrexham		Level: 41.31	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.50	D						
		6.00 6.00 6.00 - 6.45	D SPTL S	N=12 (2,3/3,3,3,3)					6
		7.00 7.00 7.00 - 7.45	D SPTL S	N=18 (2,3/4,4,5,5)	7.00	34.31		Stiff, greyish brown silty CLAY. TILL	7
		8.00 8.00 8.00 - 8.45	D SPTL S	N=19 (2,3/4,4,5,6)					8
		9.00 9.00 9.00 - 9.45	D SPTL S	N=21 (3,4/5,5,5,6)					9
		10.00		N=23 (3,4/5,6,6,6)					10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.20m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Cased to 7.50m

Borehole Log

Borehole No. **CP08**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336776.52 - 347910.92	Hole Type CP
Location: Wrexham		Level: 41.31	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.45	SPTL S		10.45	30.86		End of borehole at 10.45 m

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Remarks
1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 2.20m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Cased to 7.50m

Borehole Log

Borehole No. **CP09**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336957.45 - 347969.54	Hole Type CP
Location: Wrexham		Level: 38.63	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.40	38.23		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		0.60	D					Stiff, dark orangish brown, slightly gravelly, sandy CLAY. Sand is fine to medium. Gravel is fine to medium, subrounded to rounded of sandstone and iron rich sandstone and quartz. TILL
		0.90	ES					
		1.20 - 1.65	U					
		1.70	D					
		2.30		N=18 (2,3/4,4,5,5)	2.30	36.33		
		2.30 - 2.75	SPTLS					Firm to stiff, dark brown, mottled grey, silty CLAY turning stiff at 8.50m TILL
		3.40		N=16 (3,3/3,4,4,5)				
		3.40 - 3.85	SPTLS					
		4.50		N=16 (3,4/3,4,4,5)				
		4.50 - 4.95	SPTLS					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination.

Borehole Log

Borehole No. **CP09**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336957.45 - 347969.54	Hole Type CP
Location: Wrexham		Level: 38.63	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.60 5.60 - 6.05	SPTL S	N=14 (3,3/3,3,4,4)				
		6.70 - 7.10	U					
		7.20	D					
		7.80 7.80 - 8.25	SPTL S	N=14 (2,3/3,3,4,4)				
		8.90 8.90 - 9.35	SPTL S	N=15 (3,3/3,4,4,4)				
		9.20	D					
		10.00		N=16 (3,4/4,4,4,4)				

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination.

AGS

Borehole Log

Borehole No. **CP09**

Sheet 3 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336957.45 - 347969.54	Hole Type CP
Location: Wrexham		Level: 38.63	Scale 1:25
Client: Net World Sports		Dates: 13/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.45	SPTL S		10.45	28.18		End of borehole at 10.45 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination.

Borehole Log

Borehole No. **CP10**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337034.15 - 347891.39	Hole Type CP
Location: Wrexham		Level: 39.46	Scale 1:25
Client: Net World Sports		Dates: 10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	39.16		Soft, dark brown, slightly sandy, silty CLAY. Sand is fine to coarse with rare rootlets. TOPSOIL
		0.70	D					Stiff, light orangish brown, slightly silty CLAY TILL
		1.20 - 1.65	U					
		1.70	D		1.70	37.76		Firm, light brown, slightly silty CLAY TILL
		2.20 2.20 - 2.65	SPTL S	N=21 (3,4/5,5,5,6)				*Stiff between 2.2m and 3m bgl.*
		3.30 3.30 - 3.75	SPTL S	N=11 (2,2/3,3,2,3)				
		4.30 4.30 - 4.75	SPTL S	N=9 (1,1/2,2,2,3)				
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP10**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337034.15 - 347891.39	Hole Type CP
Location: Wrexham		Level: 39.46	Scale 1:25
Client: Net World Sports		Dates: 10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 5.50 - 5.95	SPTL S	N=11 (2,2/3,3,2,3)				
		6.50 6.50 - 6.95	SPTL S	N=11 (2,2/2,3,3,3)				
		7.70 7.70 - 8.15	SPTL S	N=15 (2,2/3,3,4,5)				
		8.60 - 9.05	U					
		9.10	D					
		9.70 9.70 - 10.15	SPTL S	N=15 (2,3/3,3,4,5)				

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP10**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337034.15 - 347891.39	Hole Type CP
Location:	Wrexham		Level:	39.46	Scale 1:25
Client:	Net World Sports		Dates:	10/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.15	29.31		End of borehole at 10.15 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m 6) Installed and Backfilled

Borehole Log

Borehole No. **CP11**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337119.21 - 347965.86	Hole Type CP
Location: Wrexham		Level: 37.57	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	37.27		Soft, dark brown, slightly sandy, silty CLAY. Sand is fine to coarse with rare rootlets. TOPSOIL
		1.00	D					Firm, light brown, mottled grey, slightly silty CLAY TILL
		1.20		N=9 (1,1/1,2,3,3)				
		1.20 - 1.65	SPTL S					
		2.00 - 2.45	U					
		2.50	D					
		3.00	D		3.00	34.57		
		3.00		N=12 (1,2/3,3,3,3)				Firm, light reddish brown, slightly silty CLAY TILL
		3.00 - 3.45	SPTL S					
		4.00 - 4.45	U					
		4.50	D					
		5.00	D					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP11**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337119.21 - 347965.86	Hole Type CP
Location: Wrexham		Level: 37.57	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.00 5.00 - 5.45	SPTL S	N=12 (2,3/3,3,3,3)					6
					6.50	31.07		Soft, dark brown, slightly silty CLAY TILL	
		7.00 7.00 7.00 - 7.45	D SPTL S	 N=19 (2,3/4,5,5,5)	7.00	30.57		Firm to stiff, dark brown, slightly silty CLAY TILL	7
		8.00 - 8.45	U						8
		8.50	D						
		9.00 9.00 9.00 - 9.45 9.00 - 9.45	D SPTL S SPTL S	 N=23 (4,5/5,6,6,6)					9
		10.00	D						10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP11**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337119.21 - 347965.86	Hole Type CP
Location:	Wrexham		Level:	37.57	Scale 1:25
Client:	Net World Sports		Dates:	09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 10.00 - 10.45	SPTL S	N=24 (4,5/6,6,6,6)	10.45	27.12		End of borehole at 10.45 m

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Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.50m 6) Installed and backfilled.

Borehole Log

Borehole No. **CP12**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336903.52 - 348034.51	Hole Type CP
Location: Wrexham		Level: 38.12	Scale 1:25
Client: Net World Sports		Dates: 16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D					Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
					0.50	37.62		
		0.70	D					Dark yellowish brown, slightly silty, slightly gravelly clayey, fine to medium SAND. Gravel is fine to medium, subrounded to rounded of sandstone and quartz. TILL
					1.00	37.12		
		1.20 - 1.65	U					Firm to stiff, light greyish brown, silty CLAY becoming firm at 2.20m TILL
		1.70	D					
		2.30 2.30 - 2.75	SPTL S	N=14 (3,3/3,3,4,4)				
		3.30 3.30 - 3.75	SPTL S	N=16 (3,3/3,4,4,5)				
		4.40 - 4.85	U					
		4.90	D					

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 7.50m

Borehole Log

Borehole No. **CP12**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336903.52 - 348034.51	Hole Type CP
Location: Wrexham		Level: 38.12	Scale 1:25
Client: Net World Sports		Dates: 16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 5.50 - 5.95	SPTL S	N=11 (2,2/2,3,3,3)				
		6.60 6.60 - 7.05	SPTL S	N=14 (2,2/3,3,4,4)	6.60	31.52		Firm to stiff, light greyish brown, slightly sandy, silty CLAY. Sand is fine TILL
		7.80 7.80 - 8.25	SPTL S	N=18 (3,4/4,4,5,5)				
		8.80 8.80 - 9.25	SPTL S	N=17 (3,3/4,4,4,5)				
		9.60 9.60 - 10.05	SPTL S	N=13 (3,3/3,3,3,4)				

Continued on next sheet

6 7 8 9 10

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 7.50m

Borehole Log

Borehole No. **CP12**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336903.52 - 348034.51	Hole Type CP
Location:	Wrexham		Level:	38.12	Scale 1:25
Client:	Net World Sports		Dates:	16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.05	28.07		End of borehole at 10.05 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 7.50m

Borehole Log

Borehole No. **CP13**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336786.60 - 348095.29	Hole Type CP
Location: Wrexham		Level: 38.41	Scale 1:25
Client: Net World Sports		Dates: 16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.40	38.01		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		1.00 1.00	D ES					Soft, light orangish brown, mottled grey, silty CLAY turning firm at 2.40m TILL
		1.20 1.20 - 1.65	SPTL S	N=7 (1,2/2,1,2,2)				
		2.00 - 2.45	U					
		2.50	D					
		3.00 3.00 3.00 - 3.45	D SPTL S	N=8 (1,2/2,2,2,2)				*Firm below 3.5m bgl.*
		4.00 4.00 4.00 - 4.45	D SPTL S	N=10 (2,1/2,3,2,3)				
		5.00 - 5.45	U		4.80	33.61		Soft, light brown mottled grey, silty CLAY with rare sand bands

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP13**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336786.60 - 348095.29	Hole Type CP
Location: Wrexham		Level: 38.41	Scale 1:25
Client: Net World Sports		Dates: 16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50	D		5.80	32.61		TILL
		6.00 6.00 6.00 - 6.45	D SPTL S	N=13 (2,3/3,3,3,4)				Firm, light brown mottled grey, silty CLAY TILL
		7.00 7.00 7.00 - 7.45	D SPTL S	N=15 (3,3/3,4,4,4)				
		8.00 8.00 8.00 - 8.45	D SPTL S	N=17 (3,4/4,4,4,5)				*Stiff below 8m bgl.*
		9.00 9.00 9.00 - 9.45	D SPTL S	N=22 (3,4/5,5,6,6)				
		10.00		N=23 (4,5/5,6,6,6)				

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP13**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336786.60 - 348095.29	Hole Type CP
Location:	Wrexham		Level:	38.41	Scale 1:25
Client:	Net World Sports		Dates:	16/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.00 - 10.45	SPTL S		10.45	27.96		End of borehole at 10.45 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP14** Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336787.52 - 348242.61	Hole Type CP
Location: Wrexham		Level: 36.52	Scale 1:25
Client: Net World Sports		Dates: 17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	D		0.40	36.12		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		1.00	D					Firm, dark orangish brown, slightly sandy, gravelly, silty CLAY. Sand is fine. Gravel is subrounded to rounded, fine to medium of sandstone, mudstone and quartz. Cobble encountered at 1.00m being pushed down to 3.00m. Cobbles are 10 x 0.6 x 0.5 cm TILL
		1.20 1.20 - 1.65	SPTL S	N=13 (2,3/3,4,3,3)				
		2.00 2.00 2.00 - 2.45	D SPTL S	N=19 (7,6/5,5,4,5)	2.00	34.52		Firm, light greyish brown, sandy, silty CLAY. Sand is fine with occasional sand pockets. TILL
		3.00 3.00 3.00 - 3.45	D SPTL S	N=10 (3,2/2,3,2,3)				
		4.00 - 4.45	U					
		4.50	D					
		5.00		N=12 (3,3/3,3,3,3)				

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Installed and Backfilled. 6) Cased to 9.00m

Borehole Log

Borehole No. **CP14**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336787.52 - 348242.61	Hole Type CP
Location: Wrexham		Level: 36.52	Scale 1:25
Client: Net World Sports		Dates: 17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		5.00 - 5.45	SPTL S						
		5.50	D						
		6.00 - 6.45	U						6
		6.50	D						
		7.00	D		7.00	29.52			7
		7.00		N=9 (2,1/2,2,3,2)				Loose, dark brown, silty fine SAND TILL	
		7.00 - 7.45	SPTL S						
		8.00	D						8
		8.00		N=5 (1,1/1,1,1,2)					
		8.00 - 8.45	SPTL S						
		9.00	D		9.00	27.52			9
		9.00		N=13 (2,3/3,3,3,4)				Firm, dark brown slightly sandy, silty CLAY. Sand is fine TILL	
		9.00 - 9.45	SPTL S						
								Continued on next sheet	10

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Installed and Backfilled. 6) Cased to 9.00m

Borehole Log

Borehole No.
CP14
Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336787.52 - 348242.61	Hole Type CP
Location:	Wrexham		Level:	36.52	Scale 1:25
Client:	Net World Sports		Dates:	17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	26.06		End of borehole at 10.45 m

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Remarks
1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 7.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Installed and Backfilled. 6) Cased to 9.00m

Borehole Log

Borehole No. **CP15**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336902.58 - 348163.06	Hole Type CP
Location: Wrexham		Level: 36.32	Scale 1:25
Client: Net World Sports		Dates: 17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.40	35.92		Dark brown, slightly silty, sandy CLAY with rare rootlets. Sand is fine. TOPSOIL
		0.50	D					Medium dense, light orangish brown, slightly gravelly, slightly clayey, silty, fine to medium SAND. Gravel is fine to coarse, subrounded to rounded of sandstone and mudstone. Turning dark orangish brown at 1.00m TILL
		0.80	ES					
		1.20 1.20 - 1.65	SPTL S	N=12 (2,2/3,3,3,3)				
		2.20 2.20 - 2.65	SPTL S	N=15 (3,3/3,4,4,4)	2.20	34.12		Firm, dark greyish brown, slightly sandy, silty CLAY. Sand is fine. TILL
		3.30 - 3.75	U					
		3.80	D					
		4.50 4.50 - 4.95	SPTL S	N=11 (2,2/2,2,3,4)				
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled and installed. 6) Cased to 6.00m

Borehole Log

Borehole No. **CP15**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336902.58 - 348163.06	Hole Type CP
Location: Wrexham		Level: 36.32	Scale 1:25
Client: Net World Sports		Dates: 17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 5.50 - 5.95 5.60	SPTL S D	N=12 (3,3/3,3,3,3)				
		6.60 6.60 - 7.05	SPTL S	N=16 (3,4/4,4,4,4)				*Stiff below 6.6m bgl.*
		7.60 - 8.05	U					
		8.10	D					
		8.70 8.70 - 9.15	SPTL S	N=16 (3,3/4,4,4,4)				
		9.70 9.70 - 10.15	SPTL S	N=18 (3,4/4,5,5)				

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled and installed. 6) Cased to 6.00m

Borehole Log

Borehole No. **CP15**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336902.58 - 348163.06	Hole Type CP
Location:	Wrexham		Level:	36.32	Scale 1:25
Client:	Net World Sports		Dates:	17/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.15	26.16		End of borehole at 10.15 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 6.00m as slow ingress 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled and installed. 6) Cased to 6.00m

Borehole Log

Borehole No. **CP16**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337057.59 - 348190.07	Hole Type CP
Location: Wrexham		Level: 34.70	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	34.40		Dark brown, slightly sandy, silty CLAY with rare rootlets. Sand is fine to coarse TOPSOIL
		0.50	D					Stiff, orangish brown, mottled grey, slightly silty CLAY TILL
		1.20 1.20 - 1.85	SPTL S	N=19 (3,4/4,5,5,5)				
		2.20 2.20 - 2.65	SPTL S	N=12 (2,2/3,3,3,3)	2.20	32.50		Firm, dark greyish brown, slightly silty CLAY TILL
		3.10 3.10 - 3.55	SPTL S	N=10 (2,3/3,2,3,2)				
					3.55	31.15		Firm to stiff, dark brown CLAY TILL
		4.30 - 4.75	U					
		4.80	D					
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.20m as slow ingress. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m.

Borehole Log

Borehole No. **CP16**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337057.59 - 348190.07	Hole Type CP
Location: Wrexham		Level: 34.70	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.40 5.40 - 5.85	SPTL S	N=12 (2,2/3,3,3,3)				
		6.50 6.50 - 6.95	SPTL S	N=15 (3,2/4,3,4,4)				
		7.50 - 7.95	U					
		8.00	D					
		8.60 8.60 - 9.05	SPTL S	N=15 (3,3/3,4,4,4)				
		9.70 9.70 - 10.15	SPTL S	N=16 (3,3/4,4,4,4)				

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.20m as slow ingress. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m.

Borehole Log

Borehole No. **CP16**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337057.59 - 348190.07	Hole Type CP
Location:	Wrexham		Level:	34.70	Scale 1:25
Client:	Net World Sports		Dates:	06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.15	24.55		End of borehole at 10.15 m

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Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.20m as slow ingress. 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m.

Borehole Log

Borehole No. **CP17**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336985.16 - 348124.89	Hole Type CP
Location: Wrexham		Level: 35.98	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	35.68		Dark brown, slightly sandy, silty CLAY with rare rootlets. Sand is fine to coarse TOPSOIL
		0.70	D					Stiff, orangish brown, slightly silty, slightly sandy CLAY, becoming mottled grey at 1.70m. TILL
		1.20 - 1.65	U					
		1.70	D					
		2.20		N=10 (1,1/2,2,3,3)	2.20	33.78		
		2.20 - 2.65	SPTL S					Firm, light brown, slightly silty CLAY TILL
		3.30		N=11 (2,2/3,2,3,3)				
		3.30 - 3.75	SPTL S					
		4.40		N=11 (2,2/2,3,3,3)	4.40	31.58		
		4.40 - 4.85	SPTL S					Firm to stiff, light brown CLAY TILL

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP17**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336985.16 - 348124.89	Hole Type CP
Location: Wrexham		Level: 35.98	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.50 5.50 - 5.95	SPTL S	N=15 (3,3/3,4,4,4)				
		6.50 - 6.95	U					
		7.00	D					
		7.60 7.60 - 8.05	SPTL S	N=17 (3,3/4,4,4,5)				
		8.50 8.50 - 8.95	SPTL S	N=17 (3,4/4,4,4,5)				
		9.80 9.80 - 10.25	SPTL S	N=18 (3,4/4,4,5,5)				

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP17**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336985.16 - 348124.89	Hole Type CP
Location:	Wrexham		Level:	35.98	Scale 1:25
Client:	Net World Sports		Dates:	06/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.25	25.73		End of borehole at 10.25 m

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 6.00m

Borehole Log

Borehole No. **CP18**

Sheet 1 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337051.88 - 348068.79	Hole Type CP
Location: Wrexham		Level: 36.35	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	36.05		Soft, dark brown, slightly sandy, silty CLAY. Sand is fine to coarse with rare rootlets. TOPSOIL
		0.60	D					Stiff, reddish brown, mottled grey, silty CLAY TILL
		1.20 1.20 - 1.65	SPTL S	N=20 (3,3/5,5,5,5)				
		2.20 2.20 - 2.65	SPTL S	N=18 (3,5/4,4,5,5)	2.05	34.30		Firm, light reddish brown, slightly silty CLAY TILL
		3.20 - 3.65	U					
		3.70	D					
		4.50 4.50 - 4.75	SPTL S	N=10 (2,2/2,2,3,3)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Installed and backfilled.

Borehole Log

Borehole No. **CP18**

Sheet 2 of 3

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337051.88 - 348068.79	Hole Type CP
Location: Wrexham		Level: 36.35	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.40 5.40 - 5.85	SPTL S	N=12 (2,2/3,3,3,3)				
		6.50 6.50 - 6.95	SPTL S	N=11 (2,2/3,2,3,3)				
		7.50 7.50 - 7.95	SPTL S	N=16 (3,3/4,4,4,4)				*Becoming stiff at 7.50m*
		8.70 8.70 - 9.15 8.80	SPTL S D	N=16 (3,4/4,4,4,4)				
		10.00 - 10.45	U					

6 7 8 9 10

Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Installed and backfilled.

Borehole Log

Borehole No. **CP18**

Sheet 3 of 3

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337051.88 - 348068.79	Hole Type CP
Location:	Wrexham		Level:	36.35	Scale 1:25
Client:	Net World Sports		Dates:	09/12/2024 -	Logged By JL

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D		10.50	25.85		End of borehole at 10.50 m

11

12

13

14

15

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Installed and backfilled.

Trial Pit Log

Trialpit No **TP01**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336836.51 - 347731.23 Level: 41.98	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.5 x 0.9 Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.30	41.68		Dark brown silty CLAY with rare rootlets TOPSOIL
	1.10	B					Reddish brown, silty, fine to medium SAND TILL
▼				1.45	40.53		Grey, slightly cobbly, silty, very gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse, iron rich sandstone, quartzite and sandstone. Cobbles are subrounded to rounded of quartzite (90mm x 70mm x 20mm) TILL
	1.95	B	HVR=130	1.90	40.08		Stiff, reddish brown, mottled pale grey silty CLAY with occasional rootlets TILL
	2.20	D					
				3.00	38.98		End of pit at 3.00 m

1 2 3 4 5

Remarks: 1) Groundwater encountered at 1.70m bgl as moderate inflow. 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Unstable at 0.1-1.9m

Trial Pit Log

Trialpit No **TP02**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336992.04 - 347724.58 Level: 43.45	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.8 × 0.6, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	43.20		Dark brown, silty CLAY with rare rootlets TOPSOIL
							Reddish brown, silty, clayey, fine to medium SAND TILL
	1.20	B					*Becoming reddish brown, mottled grey at 1.30m bgl.*
	2.00	B					
▼			HVR=130	2.70	40.75		Stiff, reddish brown, mottled pale grey, silty CLAY with occasional rootlets. TILL
				3.00	40.45		End of pit at 3.00 m

Remarks: 1) Groundwater encountered at 2.90m bgl as moderate ingress 2) Terminated at target depth. 3) Backfilled with arisings 4) No visual or olfactory evidence of contamination.

Stability: Stable

Trial Pit Log

Trialpit No **TP03**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337062.73 - 347720.68 Level: 44.09	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.5 × 0.7, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	43.79		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.55	B	HVR=72 HVR=71 HVR=82				Stiff, yellowish brown, slightly sandy CLAY. Sand is fine. TILL *Becoming reddish brown, mottled pale grey at 0.55m bgl.*
			HVR=125				
	1.50	B	HVR=110				
			HVR=118				*Becoming bluish grey, mottled reddish brown at 2.00m*
			HVR=110				
				3.00	41.09		End of pit at 3.00 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings 5) Ceramic land drain encountered at 0.30m bgl East to West.

Stability: Stable

Trial Pit Log

Trialpit No **TP04**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336880.27 - 347791.21 Level: 40.89	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.6 × 0.8, Depth 3.20	Scale 1:25
Client: Net World Sports			Logged JL

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	40.59		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.50	B					Yellowish brown becoming reddish brown at 0.65m bgl, slightly silty, fine to medium SAND TILL
				0.95	39.94		Grey, slightly cobbly, very silty, gravelly, fine to coarse SAND. Gravel is rounded to subrounded, fine to coarse of quartzite. Cobbles are rounded to subrounded (80mm x 65mm x 50mm) TILL
▼	1.50	B					
	2.00	D	HVR=62 HVR=84 HVR=92	1.95	38.94		Stiff, reddish brown, slightly silty, slightly gravelly CLAY. Gravel is subangular, fine to medium mudstone. TILL
			HVR=78 HVR=68 HVR=60				*Becoming firm and silty at 2.50m bgl.*
			HVR=25 HVR=40 HVR=40	3.20	37.69		*Becoming soft at 3.10m bgl.* End of pit at 3.20 m

Remarks: 1) Groundwater encountered at moderate influx at 1.70m bgl. 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Unstable at 0.75m to 1.80m

Trial Pit Log

Trialpit No **TP05** Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336865.78 - 347869.60 Level: 40.14	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.4 × 0.9, Depth 3.10	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25	39.89		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.80	B					Brown, slightly gravelly, clayey, fine to coarse SAND. Gravel is subrounded, fine to coarse of quartzite. TILL
				1.10	39.04		
	1.20	D	HVR=130 HVR=130 HVR=130				Very stiff, reddish brown mottled pale grey, slightly silty CLAY. TILL
	1.80	B	HVR=125 HVR=130 HVR=124				*Stiff below 1.8m bgl.*
			HVR=78 HVR=79 HVR=130				*Becoming very silty at 2.50m bgl*
			HVR=39 HVR=53 HVR=47				*Becoming firm at 2.80m bgl*
				3.10	37.04		End of pit at 3.10 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings

Stability: Stable

Trial Pit Log

Trialpit No **TP06**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337006.42 - 347932.40 Level: 38.64	Date 02/12/2024
Location: Wrexham	Dimensions (m): Depth 2.40	2.4 × 0.8	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	38.34		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.85	B					Yellowish brown, clayey, very silty, fine to medium SAND TILL
				1.35	37.28		Grey, slightly clayey, slightly cobbly, very sandy, subangular to subrounded, fine to coarse GRAVEL of quartz. Cobbles are subrounded (90mm x 80mm x 70mm) TILL
▼	1.80	B					
				2.40	36.24		End of pit at 2.40 m

1 2 3 4 5

Remarks: 1) Groundwater encountered at 1.90m bgl as fast ingress 2) Terminated due to wall collapse 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Unstable between 0.8-2.4m in eastern pit wall and 1.45-2.3m in the western pit wall.

Trial Pit Log

Trialpit No **TP07**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337071.13 - 347932.41 Level: 38.51	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.5 × 0.8, Depth 2.00	Scale 1:25
Client: Net World Sports			Logged JL

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	38.21		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.50	B					Reddish brown, slightly silty, fine to medium SAND TILL
				1.00	37.51		Light brown, slightly clayey, silty, sandy, slightly cobbly GRAVEL. Sand is find to coarse, gravel is fine to medium rounded to subangular of mudstone and quartzite. Cobbles are rounded (120mm x 62mm x 70mm) TILL
	1.50	B					
			HVR=118 HVR=130	1.65	36.86		Stiff, reddish brown, mottled grey, slightly silty, slightly gravelly CLAY. Gravel is angular to subrounded, medium to coarse of quartzite TILL
				2.00	36.51		End of pit at 2.00 m

1 2 3 4 5

Remarks: 1) No groundwater encountered 2) Terminated due to fast inflow of water from land drain at 1.00m east to west. 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **TP08**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336852.83 - 348076.03 Level: 38.20	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.5 × 0.7 Depth 2.90	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	37.90		Dark brown, silty CLAY with rare rootlets. TOPSOIL
	0.60	B					Reddish brown, slightly gravelly, slightly cobbly very silty, fine to coarse SAND. Gravel is subrounded, fine of quartzite. Cobbles are subrounded (90mm x 60mm x 50mm). TILL
▼							*Becoming slightly silty, gravelly and cobbly at 1.30m bgl*
				1.80	36.40		Stiff, reddish brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subangular to rounded, fine to coarse of quartzite and sandstone. TILL
			HVR=80				
				2.50	35.70		Grey, brownish grey and reddish brown, clayey SILT with layers TILL
			HVR=80 HVR=74 HVR=72				
				2.90	35.30		End of pit at 2.90 m

Remarks: 1) Groundwater encountered at 1.45m bgl as slow ingress 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Unstable between 1.30 and 1.95m

Trial Pit Log

Trialpit No **TP09**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336857.98 - 348192.74 Level: 36.26	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.4 × 0.75, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.40	35.86		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.60	B					Orangish brown, slightly cobbly, silty, very clayey, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of flint and quartzite. Cobbles are subrounded (110mm x 60mm x 60mm) TILL
	1.00	B		1.10	35.16		Stiff, reddish brown, mottled grey, slightly gravelly, slightly sandy, silty CLAY. Gravel is subrounded to rounded, fine to coarse of quartzite and sandstone. TILL
			HVR=90 HVR=104 HVR=90	2.60	33.66		Grey, brownish grey and reddish brown, clayey SILT with layers TILL
				3.00	33.26		End of pit at 3.00 m

Remarks: 1) Groundwater not encountered 2) Terminated at target depth. 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings

Stability: Stable

Trial Pit Log

Trialpit No **TP10**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336815.99 - 348211.39 Level: 36.48	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.7 × 0.75, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged AM

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35	36.13		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.50	B					Orangish brown, slightly cobbly, silty, very clayey, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of flint and quartzite. Cobbles are subrounded (110mm x 60mm x 60mm) TILL
	0.90	B		0.95	35.53		Stiff, reddish brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subangular to sounded, fine to coarse as quartzite and sandstone. TILL
			HVR=110 HVR=130 HVR=130				
				2.30	34.18		Firm, brownish grey and reddish brown, thickly laminated clayey SILT. TILL
			HVR=50 HVR=69				
				3.00	33.48		End of pit at 3.00 m

1 2 3 4 5

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) backfilled with arisings.

Stability: Stable

AGS

Trial Pit Log

Trialpit No **TP11**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336906.99 - 348211.56 Level: 35.58	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.5 × 0.75, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	35.28		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.80	B					Orangish brown, slightly cobbly, silty, very clayey, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of flint and quartzite. Cobbles are subrounded (110mm x 60mm x 60mm) TILL
	1.30	B					
▼				1.50	34.08		Grey, brownish grey and reddish brown, slightly sandy, clayey SILT with layers. Sand is fine. TILL
				3.00	32.58		End of pit at 3.00 m

1 2 3 4 5

Remarks: 1) Groundwater encountered at 1.80m bgl as slight seepage 2) Terminated at target depth 3) Backfilled with arisings.

Stability: Unstable between 1.70 to 2.20m bgl

Trial Pit Log

Trialpit No **TP12**

Sheet 1 of 1

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336989.78 - 348021.38 Level: 37.78
Date	03/12/2024		
Location:	Wrexham	Dimensions (m):	2.7 × 0.75, Depth 3.10
Scale	1:25		
Client:	Net World Sports		
Logged	GF		

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	37.48		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.50	B	HVR=60 HVR=75 HVR=78				Firm, reddish brown, mottled grey, slightly sandy, slightly silty CLAY. Sand is fine to medium. TILL
	1.00	B					
				1.90	35.88		Dark grey, thickly laminated, clayey SILT. TILL
				3.10	34.68		End of pit at 3.10 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) Backfilled with arisings 4) Land drain encountered at 0.70m bgl orientation North East to South West.

Stability: Stable

Trial Pit Log

Trialpit No **TP13**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337030.74 - 348102.52 Level: 35.95	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.4 × 0.7, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							Dark brown, silty CLAY with rare rootlets TOPSOIL
				0.40	35.55		Orangish brown, slightly gravelly, slightly cobbly, very clayey, fine to coarse SAND. Gravel is rounded to subrounded, fine to coarse of quartzite. Cobbles are rounded (70mm x 90mm x 40mm) TILL *Becoming slightly clayey, very gravelly at 0.65m*
				0.95	35.00		Stiff, reddish, brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subangular to rounded, fine to coarse as quartzite and sandstone. TILL
			HVR=130 HVR=120 HVR=130				
			HVR=100 HVR=100 HVR=68				
				2.30	33.65		Grey, brownish grey and reddish brown, clayey SILT with layers. TILL
				3.00	32.95		End of pit at 3.00 m

Remarks: 1) No groundwater encountered 2) Terminated target depth 3) Backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **TP14**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337063.25 - 348124.95 Level: 35.53	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.6 × 0.7 Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35	35.18		Dark brown, silty CLAY with rare rootlets TOPSOIL
				0.75	34.78		Orangish brown, slightly cobbly, very clayey, fine to coarse SAND. Cobbles are rounded (70mm x 90mm x 40mm) TILL
			HVR=110 HVR=115 HVR=120 HVR=80	2.30	33.23		Stiff, reddish, brown, mottled grey, slightly gravelly, silty CLAY. Gravel is subangular to rounded, fine to coarse as quartzite and sandstone. TILL
			HVR=60 HVR=66 HVR=58	3.00	32.53		Firm, grey, brownish grey and reddish brown, clayey SILT with layers. TILL End of pit at 3.00 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) Backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **TP15**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337117.52 - 347834.96 Level: 41.07	Date 02/12/2024
Location: Wrexham		Dimensions (m): 2.4 × 0.7, Depth 2.80	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	40.76		Dark brown, silty CLAY with rare rootlets TOPSOIL
	0.50	B	HVR=75 HVR=86 HVR=80				Stiff, reddish brown, silty CLAY TILL
							Becoming mottled grey at 0.80m bgl
	1.80	B	HVR=120 HVR=130 HVR=130				*Becoming very silty at 1.80m bgl.*
			HVR=125 HVR=130 HVR=120				
			HVR=110 HVR=108 HVR=126				
				2.80	38.26		End of pit at 2.80 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) BAckfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **TP16**

Sheet 1 of 1

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337153.95 - 347850.04 Level: 40.88
Location:	Wrexham	Dimensions (m): Depth 3.10	3 × 0.7
Client:	Net World Sports		

Date 02/12/2024

Scale 1:25

Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.35	40.53		Dark brown, silty CLAY with rare rootlets TOPSOIL
			HVR=110 HVR=120 HVR=105				Stiff, reddish brown, slightly silty CLAY TILL
	1.00	B	HVR=80				
	1.50	B	HVR=130 HVR=80 HVR=130				
			HVR=125 HVR=130 HVR=130				*Becoming silty at 2.00m*
			HVR=123 HVR=130 HVR=130				
			HVR=122 HVR=130 HVR=116	3.10	37.78		End of pit at 3.10 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Stable

Trial Pit Log

Trialpit No **TP17**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337111.00 - 348028.02 Level: 36.18	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.9 × 0.75, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged GF

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	35.88		MADE GROUND: Dark brown, silty CLAY with rare rootlets. (TOPSOIL). MADE GROUND
				0.60	35.58		MADE GROUND: Light brown, slightly silty, slightly gravelly, fine to coarse SAND. Gravel is subangular to subrounded, medium to coarse of mudstone and quartz. MADE GROUND
	0.90	ES		1.10	35.08		MADE GROUND: Dark brown, silty, slightly gravelly, fine to medium SAND with organic odour. Gravel is subrounded to rounded, mudstone, and plastic. MADE GROUND
				1.55	34.63		MADE GROUND: Dark grey, silty, angular to rounded cobbles of brick, china and tile. MADE GROUND
	1.60	ES					Dark brown fibrous PEAT
	2.00	ES					*Branch encountered at 2.00m bgl*
	2.20	ES		2.10	34.08		Very soft, greyish brown organic clayey SILT
			HVR=4 HVR=18 HVR=10	3.00	33.18		End of pit at 3.00 m

Remarks: 1) No groundwater encountered 2) Terminated at target depth 3) Backfilled with arisings

Stability: Stable

Trial Pit Log

Trialpit No **TP18**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336862.42 - 347974.53 Level: 39.42	Date 03/12/2024
Location: Wrexham		Dimensions (m): 2.2 × 0.6, Depth 3.00	Scale 1:25
Client: Net World Sports			Logged JL

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	39.12		MADE GROUND: Dark brown, silty CLAY with rare rootlets. MADE GROUND
	0.50	B					MADE GROUND: Light reddish brown, silty, fine to medium SAND. MADE GROUND
▼				0.80	38.62		MADE GROUND: Light brown, slightly silty, slightly clayey, fine to medium, sandy, subrounded to subangular GRAVEL of mudstone and quartzite. MADE GROUND
	1.50 1.50	B ES		1.50	37.92		MADE GROUND: Light yellowish brown, slightly silty, slightly sandy, slightly gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of quartzite and mudstone. MADE GROUND
				2.00	37.42		MADE GROUND: Dark brown, slightly gravelly, slightly clayey SAND with organic odour. MADE GROUND
	2.20	B	HVR=16 HVR=14 HVR=15	2.50	36.92		Dark brown fibrous PEAT
	2.80	ES		2.70	36.72		Soft, dark greyish brown CLAY with organic odour.
				3.00	36.42		End of pit at 3.00 m

Remarks: 1) Groundwater encountered at 1.10m bgl as slow ingress 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings.

Stability: Unstable at 0.70m to 1.60m bgl

Borehole Log

Borehole No. **WS01**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336945.19 - 347738.42	Hole Type WS
Location: Wrexham		Level: 41.88	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	41.58		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=9 (3,2/2,2,2,3)				Loose, light brown, slightly silty, very clayey, fine to medium SAND. TILL
	▼				1.70	40.18		
		2.00 2.00	SPTL S	N=8 (1,1/1,2,2,3)				Loose. dark brown, slightly silty, very clayey, gravelly, fine to coarse SAND. Gravel is subrounded to subangular, fine to medium of sandstone, mudstone, quartz and flint. TILL
					2.30	39.58		
		3.00 3.00	SPTL S	N=50 (5,8/50 for 275mm)				Very dense, dark brown, slightly silty, very clayey, sandy, fine to medium, subangular to subrounded GRAVEL of mudstone, flint and quartz. TILL
					3.40	38.48		End of borehole at 3.40 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.80m bgl 3) Terminated on SPT refusal 4) No visual or olfactory evidence of contamination 5) Backfilled with arisings.

Borehole Log

Borehole No. **WS02**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337031.71 - 347687.21	Hole Type WS
Location: Wrexham		Level: 44.67	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.35	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.35	44.32		Light brown, slightly gravelly, very clayey SAND. Sand is fine to coarse, gravel is fine to medium, subrounded of quartzite and mudstone. TILL
					0.60	44.07		Firm to stiff, orangish brown CLAY with frequent lenses of grey SILT. TILL
		1.20 1.20	SPTL S	N=17 (4,4/4,4,4,5)				
		2.00 2.00	SPTL S	N=20 (4,4/4,4,5,7)				
		3.00 3.00	SPTL S	N=22 (4,4/4,5,6,7)				
					3.60	41.07		Stiff, greyish brown, slightly silty CLAY TILL
		4.00 4.00	SPTL S	N=23 (4,4/5,5,6,7)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS02**

Sheet 2 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337031.71 - 347687.21	Hole Type WS
Location:	Wrexham		Level:	44.67	Scale 1:25
Client:	Net World Sports		Dates:	04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=23 (4,4/5,6,6,6)	5.45	39.22		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS03**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337096.88 - 347726.73	Hole Type WS
Location: Wrexham		Level: 44.47	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	44.17		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=14 (2,4/3,4,3,3,4)	0.60	43.87		Light brown, slightly gravelly, very clayey SAND. Sand is fine to coarse, gravel is fine to medium subrounded to quartzite and mudstone. TILL
		2.00 2.00	SPTL S	N=19 (3,3/4,4,5,6)				Firm to stiff, orangish brown CLAY with frequent lenses of grey SILT. TILL
		3.00 3.00	SPTL S	N=16 (3,3/3,4,4,5)	2.90	41.57		Stiff, grey, mottled orange, clayey SILT. TILL
		4.00 4.00	SPTL S	N=15 (2,3/3,3,4,5)	3.80	40.67		Stiff, orangish brown, mottled grey CLAY TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Installed and backfilled.

Borehole Log

Borehole No. **WS03**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337096.88 - 347726.73	Hole Type WS
Location: Wrexham		Level: 44.47	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=17 (3,4/4,4,4,4,5)	5.45	39.02		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Installed and backfilled.

Borehole Log

Borehole No. **WS04**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336776.23 - 347855.10	Hole Type WS
Location: Wrexham		Level: 41.26	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	41.01		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL) TOPSOIL
								Orangish brown, slightly silty, gravelly, very clayey, fine to coarse SAND. Gravel is subrounded, fine to coarse of quartzite. TILL
					0.80	40.46		Soft, reddish brown, very silty CLAY. TILL
		1.20 1.20	SPTL S	N=7 (1,2/2,2,1,2)				
		2.00 2.00 2.00	D SPTL S	N=15 (3,3/4,4,3,4)				*Becoming firm to stiff at 2.00m*
				HVR=54				*Becoming grey at 2.50m*
				HVR=38				*Becoming soft to firm at 2.90m*
		3.00 3.00	SPTL S	N=8 (1,2/2,2,2,2)				
				HVR=20				
				HVR=4				
		4.00 4.00	SPTL S	N=9 (1,2/2,3,2,2)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) Cased to 1.00m 5) No visual or olfactory evidence of contamination.

Borehole Log

Borehole No. **WS04**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336776.23 - 347855.10	Hole Type WS
Location: Wrexham		Level: 41.26	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=9 (2,2/2,3,2,2)	5.45	35.81		End of borehole at 5.45 m

6

7

8

9

10

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) Cased to 1.00m 5) No visual or olfactory evidence of contamination.

Borehole Log

Borehole No. **WS05**

Sheet 1 of 1

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336963.70 - 347911.35	Hole Type WS
Location: Wrexham		Level: 39.30	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite, brick, plastic and sandstone TOPSOIL
					0.30	39.00		Orangish brown, clayey, gravelly SAND. Sand is fine to medium, gravel is fine to coarse subangular to subrounded of sandstone, quartzite and mudstone. TILL
					0.60	38.70		Loose, light grey, mottled orange, sandy, slightly gravelly SILT. Sand is fine, gravel is fine to medium, subangular of sandstone. TILL
		1.20 1.20	SPTL S	N=10 (2,2/3,2,2,3)				
					1.70	37.60		Loose, orangish brown, slightly clayey SAND. Sand is fine to coarse. TILL
		2.00 2.00	SPTL S	N=8 (3,2/1,2,3,2)				
		3.00 3.00	SPTL S	N=11 (2,3/3,2,3,3)	3.00	36.30		Medium dense, orangish brown, clayey, gravelly SAND. Sand is fine to coarse, gravel is fine to coarse, subangular to well rounded of quartzite, sandstone and mudstone. TILL
		4.00 4.00	SPTL S	N=14 (2,2/3,3,4,4)				
					4.45	34.85		End of borehole at 4.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.70m bgl 3) Terminated due to sand and gravel 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m bgl 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS06**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337110.23 - 347891.78	Hole Type WS
Location: Wrexham		Level: 39.67	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	39.37		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone. TOPSOIL
					0.90	38.77		Orangish brown, clayey, gravelly SAND. Sand is fine to medium, gravel is fine to coarse subangular to subrounded of sandstone, quartzite and mudstone. TILL
		1.20 1.20	SPTL S	N=8 (2,2/2,2,2,2)	1.20	38.47		Soft, orangish brown, mottled grey CLAY. TILL
		2.00 2.00	SPTL S	N=18 (4,3/3,4,5,6)				Soft to stiff, orangish brown CLAY with frequent lenses of grey SILT. TILL
		3.00 3.00	SPTL S	N=11 (2,2/2,3,3,3)	3.20	36.47		Medium dense, grey, slightly clayey SILT TILL
		4.00 4.00	SPTL S	N=9 (2,2/2,2,2,3)	4.10	35.57		Firm, greyish brown, slightly silty CLAY TILL
		5.00		N=14 (2,3/3,3,4,4)				Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Installed and backfilled 5) Cased to 2.00m

Borehole Log

Borehole No. **WS06**

Sheet 2 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337110.23 - 347891.78	Hole Type WS
Location:	Wrexham		Level:	39.67	Scale 1:25
Client:	Net World Sports		Dates:	03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.45	34.22		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Installed and backfilled 5) Cased to 2.00m

Borehole Log

Borehole No. **WS07**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337036.30 - 347960.47	Hole Type WS
Location: Wrexham		Level: 37.87	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone. (TOPSOIL)
					0.30	37.57		TOPSOIL
								Soft to firm, orangish brown, clayey, gravelly SAND. Sand is fine to medium, gravel is fine to coarse subangular to subrounded of sandstone, quartzite and mudstone. TILL
	▼	1.20 1.20	SPTL S	N=11 (2,2/2,2,3,4)				
					1.40	36.47		Soft to firm, orangish brown CLAY with frequent lenses of grey SILT. TILL
		2.00 2.00	SPTL S	N=12 (2,2/3,3,3,3)				
		3.00 3.00	SPTL S	N=7 (1,1/1,2,2,2)				
					3.80	34.07		Loose, grey, slightly clayey SILT TILL
		4.00 4.00	SPTL S	N=8 (1,2/1,2,2,3)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.30m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings

Borehole Log

Borehole No. **WS07**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337036.30 - 347960.47	Hole Type WS
Location: Wrexham		Level: 37.87	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=8 (1,1/2,2,2,2)	5.45	32.42		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.30m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings

Borehole Log

Borehole No. **WS08**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336786.75 - 348035.19	Hole Type WS
Location: Wrexham		Level: 39.75	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	39.45		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.85	38.90		Orangish brown slightly gravelly, very clayey SAND with moderate cobble content. Sand is fine to medium, gravel is fine to coarse, subangular to subrounded of quartzite, sandstone and mudstone. Cobble is subangular of quartzite. TILL
		1.20 1.20	SPTL S	N=6 (3,2/1,2,2,1)				Soft to firm, orangish brown, mottled grey, very silty CLAY TILL
		2.00 2.00	SPTL S	N=9 (3,3/2,2,2,3)				
		3.00 3.00	SPTL S	N=6 (1,1/2,1,1,2)				
		4.00 4.00	SPTL S	N=10 (2,2/3,2,3,2)	3.80	35.95		Soft to firm, light grey, slightly silty CLAY TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.00m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m

Borehole Log

Borehole No. **WS08**

Sheet 2 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336786.75 - 348035.19	Hole Type WS
Location:	Wrexham		Level:	39.75	Scale 1:25
Client:	Net World Sports		Dates:	06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=6 (1,1/2,2,1,1)	5.50	34.25		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.00m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m

Borehole Log

Borehole No. **WS09**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336897.51 - 348087.67	Hole Type WS
Location: Wrexham		Level: 37.41	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	37.16		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL) TOPSOIL
								Reddish brown, slightly gravelly, very clayey, fine to coarse SAND. Gravel is subrounded, fine to medium of quartzite. TILL
					1.00	36.41		Firm grey, mottled reddish brown silty CLAY TILL
		1.20 1.20	SPTL S	N=9 (1,1/1,2,3,3)				*Becoming grey mottled yellowish brown at 1.20m*
		1.50	D	HVR=40				
		2.00 2.00	SPTL S	N=11 (2,2/2,3,3,3)				*Becoming very silty at 1.90m*
								Becoming brown at 2.30m
		3.00 3.00	SPTL S	N=9 (1,2/2,2,2,3) HVR=50				
		4.00 4.00	SPTL S	N=11 (2,2/3,3,2,3)				
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m

Borehole Log

Borehole No. **WS09**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336897.51 - 348087.67	Hole Type WS
Location: Wrexham		Level: 37.41	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=10 (3,2/2,3,2,2,3)	5.45	31.96		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m

Borehole Log

Borehole No. **WS10**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336778.67 - 348160.23	Hole Type WS
Location: Wrexham		Level: 37.35	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.30	37.05		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL) TOPSOIL
		1.20 1.20	SPTL S	N=11 (2,3/2,3,3,3)				Soft to firm, orangish brown, slightly gravelly, very sandy CLAY. Sand is fine to coarse. Gravel is subangular, fine to coarse of limestone and quartzite. TILL
		1.60	D		1.40	35.95		Firm, reddish brown mottled grey, very silty CLAY TILL *Becoming brown at 1.60m*
		2.00 2.00	SPTL S	N=14 (3,3/3,4,3,4)				
				HVR=50				
		3.00 3.00	SPTL S	HVR=58 N=8 (1,1/2,2,2,2)				*Becoming soft at 3.00m*
▼		4.00 4.00	SPTL S	HVR=28 N=6 (1,1/2,1,2,1)	4.00	33.35		Soft, brown, slightly sandy, slightly clayey SILT. Sand is fine. TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.60m 3) Terminated at target depth. 4) No visual or olfactory evidence of contamination 5) Cased to 1.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS10**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336778.67 - 348160.23	Hole Type WS
Location: Wrexham		Level: 37.35	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=12 (1,2/3,3,3,3)				*Becoming firm at 5.00m*
					5.45	31.90		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.60m 3) Terminated at target depth. 4) No visual or olfactory evidence of contamination 5) Cased to 1.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS11**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336854.72 - 348243.41	Hole Type WS
Location: Wrexham		Level: 35.71	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	35.41		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=11 (3,2/3,2,3,3)				Medium dense, orangish brown, slightly sandy, clayey GRAVEL. Sand is fine to coarse, gravel is fine to coarse, subangular to angular of sandstone, mudstone and quartzite. TILL
		2.20 2.20	SPTL S	N=12 (3,2/3,3,3,3)	1.40	34.31		Firm, orangish brown CLAY TILL
		3.20 3.20	SPTL S	N=6 (1,1/1,1,2,2)	2.50	33.21		Soft to firm, orangish brown SILT TILL
		4.20 4.20	SPTL S	N=8 (2,2/2,2,2,2)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.50m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled with arisings.

Borehole Log

Borehole No. **WS11**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336854.72 - 348243.41	Hole Type WS
Location: Wrexham		Level: 35.71	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.20 5.20	SPTL S	N=10 (2,2/2,2,3,3)	5.50	30.21		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.50m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled with arisings.

Borehole Log

Borehole No. **WS12**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336897.43 - 348244.77	Hole Type WS
Location: Wrexham		Level: 35.24	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.35	ES		0.35	34.89		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=12 (2,2/2,3,3,4)				Medium dense, orangish brown, slightly sandy, clayey GRAVEL. Sand is fine to coarse, gravel is fine to coarse, subangular to angular of sandstone, mudstone and quartzite. TILL
		2.00 2.00	SPTL S	N=14 (3,4/4,4,3,3)	1.70	33.54		Soft to firm, orangish brown CLAY TILL
	▼	3.00 3.00	SPTL S	N=6 (1,1/2,1,2,1)	3.60	31.64		Soft to firm, orangish brown SILT TILL
		4.00 4.00	SPTL S	N=8 (1,1/2,2,2,2)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.60m 3) Terminated at target depth 4) Installed and backfilled. 5) Cased to 2.00m bgl 6) Unstable, silt infilling borehole from 3.80m bgl.

Borehole Log

Borehole No. **WS12**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336897.43 - 348244.77	Hole Type WS
Location: Wrexham		Level: 35.24	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=9 (1,1/2,2,2,3)	5.50	29.74		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.60m 3) Terminated at target depth 4) Installed and backfilled. 5) Cased to 2.00m bgl 6) Unstable, silt infilling borehole from 3.80m bgl.

Borehole Log

Borehole No. **WS13**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336972.71 - 348186.20	Hole Type WS
Location: Wrexham		Level: 35.25	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.30	34.94		Soft to firm, orangish brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse, gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and quartzite. TILL
		1.20 1.20	SPTL S	N=12 (2,2/3,3,3,3)				
					1.60	33.65		Firm, orangish brown CLAY TILL
		2.00 2.00	SPTL S	N=11 (2,2/2,3,3,3)				
					2.20	33.04		Soft, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
		3.00 3.00	SPTL S	N=7 (1,1/1,2,2,2)				
		4.00 4.00	SPTL S	N=9 (2,2/2,2,2,3)				
					4.20	31.04		Firm, orangish brown SILT TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled with arisings. 6) Cased to 2.00m bgl

Borehole Log

Borehole No. **WS13**

Sheet 2 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336972.71 - 348186.20	Hole Type WS
Location:	Wrexham		Level:	35.25	Scale 1:25
Client:	Net World Sports		Dates:	02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=14 (2,3/3,3,4,4)	5.45	29.80		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination. 5) Backfilled with arisings. 6) Cased to 2.00m bgl

Borehole Log

Borehole No. **WS14**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337014.88 - 348184.36	Hole Type WS
Location: Wrexham		Level: 35.04	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.30	34.74		Soft to firm, orangish brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse, gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and quartzite. TILL
					0.90	34.14		Soft, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
		1.20 1.20	SPTL S	N=10 (1,2/2,2,3,3)				
		2.00 2.00	SPTL S	N=7 (2,1/1,2,2,2)				
		3.00 3.00	SPTL S	N=5 (1,1/1,1,1,2)	3.00	32.04		Soft orangish brown SILT TILL
		4.00 4.00	SPTL S	N=6 (1,1/2,1,2,1)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m bgl 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS14**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337014.88 - 348184.36	Hole Type WS
Location: Wrexham		Level: 35.04	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=6 (1,1/2,1,1,2)	5.50	29.54		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m bgl 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS15**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337006.35 - 348152.27	Hole Type WS
Location: Wrexham		Level: 35.49	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.40	ES					Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.40	35.08		Soft, orangish brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse, gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and quartzite. TILL
					0.70	34.78		Soft to firm, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
		1.20 1.20	SPTL S	N=11 (2,2/3,3,2,3)				
					1.60	33.88		Soft to firm, orangish brown SILT TILL
		2.00 2.00	SPTL S	N=9 (1,2/2,2,3,2)				
		3.00 3.00	SPTL S	N=6 (1,1/2,1,2,1)				
		4.00 4.00	SPTL S	N=6 (1,1/2,1,2,1)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS15**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337006.35 - 348152.27	Hole Type WS
Location: Wrexham		Level: 35.49	Scale 1:25
Client: Net World Sports		Dates: 02/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=7 (1,2/1,2,2,2)	5.45	30.04		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS16**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337038.54 - 348149.55	Hole Type WS
Location: Wrexham		Level: 35.34	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00 - 0.30	ES		0.30	35.04		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=11 (3,2/2,3,3,3)	1.20	34.14		Orangish brown, clayey, gravelly SAND. Sand is fine to medium, gravel is fine to coarse, subangular to subrounded of sandstone, quartzite and mudstone. TILL
		2.00 2.00	SPTL S	N=11 (2,1/2,3,3,3)	2.30	33.04		Firm, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
	▼	3.00 3.00	SPTL S	N=10 (2,2/2,2,3,3)	4.40	30.94		Firm, orangish brown SILT TILL
		4.00 4.00	SPTL S	N=10 (2,2/2,2,3,3)				Soft, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.00m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS16**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337038.54 - 348149.55	Hole Type WS
Location: Wrexham		Level: 35.34	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=5 (1,1/1,1,2,2,1)				
					5.45	29.89		End of borehole at 5.45 m

6

7

8

9

10

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.00m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS17**

Sheet 1 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	337093.53 - 348114.20	Hole Type WS
Location:	Wrexham		Level:	35.33	Scale 1:25
Client:	Net World Sports		Dates:	03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.40	34.93		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=13 (2,1/2,4,4,3)				Medium dense, orangish brown, clayey, gravelly SAND. Sand is fine to medium, gravel is fine to coarse, subangular to subrounded of sandstone, quartzite and mudstone. TILL
		2.00 2.00	SPTL S	N=15 (9,3/3,4,4,4)				
	▼				2.80	32.53		Soft to firm, orangish brown SILT TILL
	▽	3.00 3.00	SPTL S	N=9 (1,2/2,2,2,3)				
		4.00 4.00	SPTL S	N=9 (1,2/2,2,2,3)				
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings. 7) Poor recovery between 1.20m and 2.00m due to suspected cobble being pushed down.

Borehole Log

Borehole No. **WS17**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337093.53 - 348114.20	Hole Type WS
Location: Wrexham		Level: 35.33	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=10 (2,2/2,3,2,3)	5.45	29.88		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 3.00m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings. 7) Poor recovery between 1.20m and 2.00m due to suspected cobble being pushed down.

Borehole Log

Borehole No. **WS18**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337095.33 - 348035.88	Hole Type WS
Location: Wrexham		Level: 36.40	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35	36.05		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
					0.70	35.70		Soft, orangish brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse, gravel is fine to coarse, subangular to subrounded of sandstone, mudstone and quartzite. TILL
		1.20 1.20	SPTL S	N=14 (2,2/3,3,4,4)				Soft to firm, orangish brown, mottled grey CLAY TILL
		2.00 2.00	SPTL S	N=15 (3,3/3,3,4,5)				
					2.30	34.10		Firm, orangish brown, mottled grey CLAY with frequent lenses of silt. TILL
		3.00 3.00	SPTL S	N=14 (2,3/3,3,4,4)				
					3.85	32.55		Firm, grey, mottled orange SILT TILL
		4.00		N=10 (2,2/2,2,3,3)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS18**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337095.33 - 348035.88	Hole Type WS
Location: Wrexham		Level: 36.40	Scale 1:25
Client: Net World Sports		Dates: 03/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=11 (2,2/2,2,3,4)	5.45	30.95		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS19**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336937.23 - 347816.45	Hole Type WS
Location: Wrexham		Level: 40.37	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	40.07		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone. (TOPSOIL). TOPSOIL
		1.20 1.20	SPTL S	N=11 (2,2/3,2,3,3)				Medium dense, light brown, slightly silty, very clayey, fine to medium SAND. TILL
	▼				1.80	38.57		
		2.00 2.00	SPTL S	N=10 (2,2/2,2,3,3)				Medium dense, dark brown, slightly silty, very clayey, gravelly, fine to coarse SAND. Gravel os subrounded to subangular, fine to medium of sandstone, mudstone, quartz and flint. TILL
					2.40	37.97		Soft orangish brown, mottled grey CLAY TILL
		3.00 3.00	SPTL S	N=8 (2,1/2,2,2,2)				
		4.00 4.00	SPTL S	N=7 (1,2/1,2,2,2)				
		4.49 4.49	SPTL S	N=7 (2,2/2,2,1,2)				
		4.90 4.90	SPTL S	N=8 (2,2/2,2,2,2)				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.80m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings. 7) Poor recovery between 1.80m and 5.50m due to sand infilling.

Borehole Log

Borehole No. **WS19**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336937.23 - 347816.45	Hole Type WS
Location: Wrexham		Level: 40.37	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.50	34.87		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.80m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings. 7) Poor recovery between 1.80m and 5.50m due to sand infilling.

Borehole Log

Borehole No. **WS20**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337172.37 - 347796.47	Hole Type WS
Location: Wrexham		Level: 44.02	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25	43.77		Dark brown, slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is fine to medium, subangular to subrounded of quartzite and sandstone TOPSOIL
		1.20 1.20	SPTL S	N=10 (1,2/2,2,3,3)				Loose, orangish brown, slightly clayey SAND. Sand is fine to coarse. TILL
	▼				1.80	42.22		Firm, orangish brown, mottled grey CLAY TILL
		2.00 2.00	SPTL S	N=15 (3,3/3,3,4,5)				
		3.00 3.00	SPTL S	N=13 (2,3/3,3,3,4)				
		4.00 4.00	SPTL S	N=9 (1,2/2,2,2,3)				
								Continued on next sheet

1 2 3 4 5

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.80m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS20**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 337172.37 - 347796.47	Hole Type WS
Location: Wrexham		Level: 44.02	Scale 1:25
Client: Net World Sports		Dates: 04/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=9 (2,2/2,2,2,3)	5.50	38.52		End of borehole at 5.50 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.80m bgl 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 2.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS21**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336835.67 - 347776.33	Hole Type WS
Location: Wrexham		Level: 41.24	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	40.99		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPOSIL). TOPSOIL
		1.20 1.20	SPTL S	N=6 (2,2/1,1,2,2)	1.20	40.04		Orangish brown, slightly silty, gravelly, very clayey, fine to coarse SAND. Gravel is subrounded, fine to coarse of quartz. TILL
		2.00 2.00 2.00	D SPTL S	N=18 (4,4/4,4,5,5)	1.90	39.34		Stiff becoming firm, reddish brown, very silty CLAY. TILL *Becoming grey at 2.20m*
				HVR=52				
		3.00 3.00	SPTL S	N=9 (2,2/2,2,3,2)				*Becoming firm at 3.00m*
				HVR=44				
		4.00 4.00	SPTL S	N=14 (3,3/4,3,3,4)				
				HVR=47				
								Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS21**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336835.67 - 347776.33	Hole Type WS
Location: Wrexham		Level: 41.24	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.45	35.79		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) No groundwater encountered 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Cased to 1.00m 6) Backfilled with arisings.

Borehole Log

Borehole No. **WS22**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336820.54 - 347886.07	Hole Type WS
Location: Wrexham		Level: 40.57	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	40.32		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartz. (TOPSOIL). TOPSOIL
		1.20 1.20	SPTL S	N=8 (1,2/2,2,2,2)	1.00	39.57		Orangish brown, slightly silty, gravelly, very clayey fine to coarse SAND. Gravel is subrounded, fine to coarse of quartz. TILL
					1.40	39.17		Soft to firm, grey, red, orangish brown and greenish grey slightly gravelly, sandy CLAY. Sand is fine to coarse, gravel is subangular to subrounded, fine to medium of quartz. TILL
		1.90	D	HVR=95	1.80	38.77		Grey, slightly gravelly, fine to coarse SAND. Gravel is rounded to subrounded, fine to coarse of quartz. TILL
		2.00 2.00	SPTL S	N=18 (4,4/4,4,4,6)				Stiff becoming soft, reddish brown, very silty CLAY TILL
								Becoming grey at 2.50m
		3.00 3.00	SPTL S	N=6 (1,2/1,2,1,2)				*Becoming soft at 3.00m*
		4.00 4.00	SPTL S	N=6 (1,2/2,1,1,2)				
				HVR=26				
								Continued on next sheet

Remarks

1) Groundwater encountered at 3.00m and 5.00m 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Cased to 1.00m 5) Backfilled with arisings.

Borehole Log

Borehole No. **WS22**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336820.54 - 347886.07	Hole Type WS
Location: Wrexham		Level: 40.57	Scale 1:25
Client: Net World Sports		Dates: 06/12/2024 -	Logged By AM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=5 (1,2/1,2,1,1)	5.45	35.12		End of borehole at 5.45 m

Remarks

1) Groundwater encountered at 3.00m and 5.00m 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Cased to 1.00m 5) Backfilled with arisings.

Borehole Log

Borehole No. **WS23**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336904.92 - 347955.99	Hole Type WS
Location: Wrexham		Level: 39.63	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.30	39.33		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL). TOPSOIL
		1.20 1.20	SPTL S	N=9 (2,2/2,2,2,3)	1.80	37.83		Loose, reddish brown, slightly gravelly, very clayey, fine to coarse SAND. Gravel is subrounded, fine to medium of quartzite. TILL
		2.00 2.00 2.00	D SPTL S	N=23 (3,3/5,5,6,7)	2.00	37.63		Stiff becoming firm, reddish brown, slightly gravelly, very sandy CLAY. Sand is fine to coarse, gravel is subrounded, fine to medium of quartzite. TILL
		2.70 2.70	SPTL S	N=15 (3,3/4,4,3,4)				Stiff, reddish brown, silty CLAY. Subangular cobble of limestone at 2.10m (70mm x 50mm x 45mm) TILL
								Becoming grey at 3.50m
		3.80 3.80	SPTL S	N=12 (2,2/2,3,3,4)				*Becoming firm at 3.80m*
		4.90 4.90	SPTL S	N=15 (3,3/3,4,4,4)				Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.30m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Backfilled with arisings. 6) Cased to 1.00m

Borehole Log

Borehole No. **WS23**

Sheet 2 of 2

Project Name:	Plot 2 Marchwiel	Project No. TE1890	Co-ords:	336904.92 - 347955.99	Hole Type WS
Location:	Wrexham		Level:	39.63	Scale 1:25
Client:	Net World Sports		Dates:	09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼				5.45	34.18		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) Groundwater encountered at 5.30m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Backfilled with arisings. 6) Cased to 1.00m

Borehole Log

Borehole No. **WS24**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336842.04 - 348149.68	Hole Type WS
Location: Wrexham		Level: 37.01	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	36.76		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL). TOPSOIL
					0.60	36.41		Orangish brown, slightly gravelly, fine to coarse SAND. Gravel is subrounded, fine to medium SANDSTONE TILL
								Yellowish brown, slightly gravelly, silty, very clayey, fine to coarse SAND. gravel is subrounded, fine to medium of sandstone. TILL
		1.20 1.20	SPTL S	N=11 (2,3/3,3,2,3)	1.20	35.81		Firm, grey mottled reddish brown, silty CLAY TILL
		1.70	D					
		2.00 2.00	SPTL S	N=12 (2,2/2,3,3,4)				*Becoming brown and very silty at 2.00m*
		3.00 3.00	SPTL S	N=9 (1,1/2,2,2,3)				
		4.00 4.00	SPTL S	N=4 (1,1/1,1,1,1)	4.00	33.01		Soft, brown, slightly sandy, slightly clayey SILT. Sand is fine. TILL
								Continued on next sheet

Remarks

1) Groundwater encountered at 4.00m bgl 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings 5) Cased to 1.00m.

Borehole Log

Borehole No. **WS24**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336842.04 - 348149.68	Hole Type WS
Location: Wrexham		Level: 37.01	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=6 (2,0/1,1,2,2)				
					5.45	31.56		End of borehole at 5.45 m

Remarks

1) Groundwater encountered at 4.00m bgl 2) Terminated at target depth 3) No visual or olfactory evidence of contamination 4) Backfilled with arisings 5) Cased to 1.00m.

Borehole Log

Borehole No. **WS25**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336957.16 - 348231.31	Hole Type WS
Location: Wrexham		Level: 34.81	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.25	34.56		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL). TOPSOIL
					0.90	33.91		Reddish brown, clayey, gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of quartzite and limestone. TILL
		1.20 1.20	SPTL S	N=11 (1,2/2,3,3,3)				Firm, grey mottled reddish brown, silty CLAY with occasional relict rootlets. TILL
		1.50	D					
		2.00 2.00	SPTL S	N=15 (3,3/3,4,4,4)	2.00	32.81		Firm to stiff, dark grey, clayey SILT with layering. TILL
		3.00 3.00	SPTL S	HVR=95 N=8 (1,2/2,2,2,2) HVR=79	3.05	31.76		Soft, reddish brown, very silty CLAY TILL
					3.80	31.01		Soft, reddish brown clayey SILT TILL
		4.00 4.00	SPTL S	N=8 (1,2/2,2,2,2)				
	▼							Continued on next sheet

Remarks

1) Hand dug pit to 1.20m bgl 2) groundwater encountered at 3.70m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Backfilled with arisings. 6) Cased to 1.00m

Borehole Log

Borehole No. **WS25**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336957.16 - 348231.31	Hole Type WS
Location: Wrexham		Level: 34.81	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=9 (1,2/2,2,2,3)				*Becoming firm at 5.00m*
					5.45	29.36		End of borehole at 5.45 m

Remarks

1) Hand dug pit to 1.20m bgl 2) groundwater encountered at 3.70m 3) Terminated at target depth 4) No visual or olfactory evidence of contamination 5) Backfilled with arisings. 6) Cased to 1.00m

Borehole Log

Borehole No. **WS26**

Sheet 1 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336948.02 - 348072.79	Hole Type WS
Location: Wrexham		Level: 37.08	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	ES		0.30	36.78		Dark brown, slightly gravelly, slightly sandy, silty CLAY with occasional rootlets. Sand is fine to coarse. Gravel is subrounded, fine to medium of quartzite. (TOPSOIL). TOPSOIL
	▼	1.20 1.20	SPTL S	N=11 (3,3/3,2,3,3)	1.20	35.88		Reddish brown, clayey, gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of quartzite and limestone. TILL
		1.50	D					
		2.00 2.00	SPTL S	HVR=57 N=12 (2,3/3,2,3,4)	2.00	35.08		Firm, reddish brown, mottled grey, very silty CLAY. TILL
		3.00 3.00	SPTL S	N=12 (2,2/2,3,3,4)				Firm, dark grey, clayey SILT with layering TILL
		4.00 4.00	SPTL S	N=10 (2,1/2,2,3,3)	4.10	32.98		*Silt band at 4.00m to 4.10m* Firm, brown very silty CLAY TILL
								Continued on next sheet

1 2 3 4 5

Remarks

1) hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.20m 3) Terminated at target depth 4) Backfilled with arisings 5) Cased to 1.00m.

Borehole Log

Borehole No. **WS26**

Sheet 2 of 2

Project Name: Plot 2 Marchwiel	Project No. TE1890	Co-ords: 336948.02 - 348072.79	Hole Type WS
Location: Wrexham		Level: 37.08	Scale 1:25
Client: Net World Sports		Dates: 09/12/2024 -	Logged By GF

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00 5.00	SPTL S	N=11 (1,2/2,2,3,4)	5.45	31.63		End of borehole at 5.45 m

Remarks

1) hand dug pit to 1.20m bgl 2) Groundwater encountered at 1.20m 3) Terminated at target depth 4) Backfilled with arisings 5) Cased to 1.00m.

APPENDIX C - GEOENVIRONMENTAL SOIL LABORATORY RESULTS

Element Materials Technology
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Zone 3
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Deeside
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Tier Environmental
Suite 414, Chadwick House
Warrington Rd
Birchwood
Warrington
United Kingdom
WA3 6AE

Attention :	Adrian Read
Date :	17th December, 2024
Your reference :	TE1890
Our reference :	Test Report 24/20663 Batch 1
Location :	Plot 2, Marchwiel, Wrexham
Date samples received :	4th December, 2024
Status :	Final Report
Issue :	202412171427

Twelve samples were received for analysis on 4th December, 2024 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 37.358 kg of CO2

Scope 1&2&3 emissions - 88.288 kg of CO2

Authorised By:



Sean Anglish
Project Coordinator

Please include all sections of this report if it is reproduced

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/20663

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	25-28	29-32	33-36	37-40	45-48	LOD/LOR	Units	Method No.
Sample ID	WS01	WS02	WS03	WS05	WS06	WS11	WS12	WS13	WS14	WS16			
Depth	0.00-0.30	0.00-0.35	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.35	0.00-0.30	0.00-0.30	0.00-0.30			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024			
Arsenic #	10.2	9.5	8.9	10.8	8.7	12.3	12.2	14.9	14.4	11.9	<0.5	mg/kg	TM30/PM15
Cadmium #	1.9	0.3	0.5	3.2	1.1	1.3	1.8	2.0	1.8	3.0	<0.1	mg/kg	TM30/PM15
Chromium #	325.2 AA	63.5	64.0	304.7 AA	84.5	370.5 AA	242.9	295.6 AA	345.4 AA	657.4 AA	<0.5	mg/kg	TM30/PM15
Copper #	74	21	20	72	27	62	63	67	71	87	<1	mg/kg	TM30/PM15
Lead #	225	65	95	202	92	186	212	231	243	234	<5	mg/kg	TM30/PM15
Mercury #	1.3	<0.1	0.2	1.0	0.3	1.0	1.2	1.7	1.8	1.6	<0.1	mg/kg	TM30/PM15
Nickel #	15.9	18.1	18.7	18.1	18.3	16.3	16.2	19.4	18.5	19.6	<0.7	mg/kg	TM30/PM15
Selenium #	2	2	<1	2	<1	2	1	2	1	2	<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	1047	721	690	865	541	1233	1331	1140	1224	1357	<50	mg/kg	TM50/PM29
Zinc #	293	109	140	347	148	265	294	329	320	386	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	0.09	<0.04	<0.04	0.07	<0.04	0.07	0.08	0.09	0.08	0.05	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.22	<0.03	<0.03	0.09	<0.03	0.09	0.13	0.12	0.14	0.06	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.24	<0.03	<0.03	0.14	<0.03	0.17	0.17	0.23	0.22	0.10	<0.03	mg/kg	TM4/PM8
Anthracene #	0.14	<0.04	<0.04	0.07	<0.04	0.07	0.08	0.10	0.12	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.64	<0.03	<0.03	0.42	0.09	0.45	0.60	0.61	0.54	0.24	<0.03	mg/kg	TM4/PM8
Pyrene #	0.62	<0.03	<0.03	0.38	0.09	0.41	0.55	0.57	0.51	0.23	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.51	<0.06	<0.06	0.34	0.09	0.42	0.51	0.44	0.43	0.18	<0.06	mg/kg	TM4/PM8
Chrysene #	0.68	<0.02	<0.02	0.42	0.09	0.42	0.58	0.55	0.53	0.23	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.27	<0.07	<0.07	0.77	0.15	0.85	1.21	1.23	1.09	0.49	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.69	<0.04	<0.04	0.43	0.09	0.49	0.71	0.67	0.62	0.24	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.65	<0.04	<0.04	0.42	0.07	0.40	0.58	0.65	0.62	0.25	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.14	<0.04	<0.04	0.07	<0.04	0.09	0.13	0.13	0.09	0.05	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.63	<0.04	<0.04	0.39	0.07	0.40	0.55	0.65	0.58	0.25	<0.04	mg/kg	TM4/PM8
PAH 16 Total	6.5	<0.6	<0.6	4.0	0.7	4.3	5.9	6.0	5.6	2.4	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.91	<0.05	<0.05	0.55	0.11	0.61	0.87	0.89	0.78	0.35	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.36	<0.02	<0.02	0.22	0.04	0.24	0.34	0.34	0.31	0.14	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98	98	95	97	98	95	97	96	100	97	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.5	2.4	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4	<4	<4	<4	<4	9	13	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	14	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	<26	<26	<26	<26	<26	<26	<26	30	<26	mg/kg	TM5/TM36/PM8/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/20663

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	25-28	29-32	33-36	37-40	45-48	LOD/LOR	Units	Method No.
Sample ID	WS01	WS02	WS03	WS05	WS06	WS11	WS12	WS13	WS14	WS16			
Depth	0.00-0.30	0.00-0.35	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.35	0.00-0.30	0.00-0.30	0.00-0.30			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024			
TPH CWG													
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	23	<7	<7	18	<7	<7	<7	9	21	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	164	<7	<7	137	<7	74	70	106	152	25	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	22	<7	<7	13	<7	<7	<7	<7	17	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	209	<26	<26	168	<26	74	70	115	190	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	209	<52	<52	168	<52	74	70	115	190	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	40	12	11	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	28.2	420.1	29.0	30.4	23.8	24.9	33.9	29.8	31.4	26.0	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0272	0.0295	0.0272	0.0396	0.0265	0.0857	0.0342	0.0461	0.0340	0.0642	<0.0015	g/l	TM38/PM20
Total Organic Carbon #	3.59	2.87	2.36	3.30	1.95	3.64	3.60	3.14	3.53	3.59	<0.02	%	TM21/PM24
pH #	6.52	7.36	7.10	6.85	7.04	7.09	7.03	6.96	6.79	6.83	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/20663	1	WS01	0.00-0.30	3	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS02	0.00-0.35	7	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS03	0.00-0.30	11	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS05	0.00-0.30	15	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS06	0.00-0.30	19	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS07	0.00-0.30	22	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS11	0.00-0.30	27	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS12	0.00-0.35	31	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/20663	1	WS13	0.00-0.30	35	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS14	0.00-0.30	39	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS15	0.00-0.40	42	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/20663	1	WS16	0.00-0.30	47	Emily Smith	13/12/2024	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Smith	13/12/2024	**Asbestos Fibres**	NAD
					Emily Smith	13/12/2024	**Asbestos ACM**	NAD
					Emily Smith	13/12/2024	**Asbestos Type**	NAD

Element Materials Technology

Notification of Deviating Samples

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 24/20663						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/20663

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 24/20663

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 24/20663

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

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Tier Environmental
Suite 414, Chadwick House
Warrington Rd
Birchwood
Warrington
United Kingdom
WA3 6AE

Attention :	Adrian Read
Date :	6th January, 2025
Your reference :	TE1890
Our reference :	Test Report 24/20879 Batch 1
Location :	Plot 2, Marchwiel, Wrexham
Date samples received :	6th December, 2024
Status :	Final Report
Issue :	202501061510

Ten samples were received for analysis on 6th December, 2024 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 28.091 kg of CO2

Scope 1&2&3 emissions - 66.387 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Technical Account Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/20879

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-4	5-7	14-17	18-21	22-24	25-28	29-31				LOD/LOR	Units	Method No.
Sample ID	TP17	TP17	TP18	TP18	WS04	WS08	WS21						
Depth	0.90	1.60	1.50	2.80	0.10	0.00-0.30	0.10						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	03/12/2024	03/12/2024	03/12/2024	03/12/2024	06/12/2024	06/12/2024	06/12/2024						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024						
Arsenic #	11.3	17.0	9.9	17.6	9.3	10.6	10.0				<0.5	mg/kg	TM30/PM15
Cadmium #	5.6	3.0	0.5	5.5	1.3	2.4	1.5				<0.1	mg/kg	TM30/PM15
Chromium #	575.3 AA	263.1 AA	81.9	363.4 AA	224.5	370.3 AA	398.4 AA				<0.5	mg/kg	TM30/PM15
Copper #	118	108	31	138	48	73	64				<1	mg/kg	TM30/PM15
Lead #	285	340	65	383	150	195	183				<5	mg/kg	TM30/PM15
Mercury #	1.6	2.6	<0.1	3.5	0.5	0.9	0.9				<0.1	mg/kg	TM30/PM15
Nickel #	24.3	24.7	21.9	23.7	17.1	16.2	16.2				<0.7	mg/kg	TM30/PM15
Selenium #	2	2	1	3	1	2	2				<1	mg/kg	TM30/PM15
Sulphur as S	-	0.17	-	-	-	-	-				<0.01	%	TM30/PM15
Total Sulphate as SO4 #	1007	1241	429	2059	808	891	983				<50	mg/kg	TM50/PM29
Total Sulphate as SO4 BRE	-	0.10	-	-	-	-	-				<0.01	%	TM50/PM29
Zinc #	560	553	117	767	231	337	276				<5	mg/kg	TM30/PM15
Magnesium	-	0.0032	-	-	-	-	-				<0.0001	g/l	TM30/PM20
PAH MS													
Naphthalene #	0.06	<0.04	<0.04	1.46	<0.04	0.07	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.09	<0.03	0.05	0.95	0.09	0.17	0.14				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	0.95	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	0.88	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.14	0.08	0.07	2.88	0.11	0.19	0.14				<0.03	mg/kg	TM4/PM8
Anthracene #	0.09	<0.04	<0.04	1.28	0.05	0.10	0.10				<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.31	0.22	0.16	2.61	0.21	0.54	0.36				<0.03	mg/kg	TM4/PM8
Pyrene #	0.28	0.17	0.15	2.39	0.20	0.51	0.38				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.23	0.17	0.14	1.46	0.17	0.41	0.36				<0.06	mg/kg	TM4/PM8
Chrysene #	0.29	0.17	0.16	1.67	0.24	0.47	0.39				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.70	0.32	0.24	3.56	0.40	1.02	0.79				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.38	0.17	0.14	2.96	0.21	0.60	0.46				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.43	0.17	0.12	2.72	0.22	0.52	0.38				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.08	<0.04	<0.04	0.49	0.05	0.11	0.07				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.48	0.17	0.11	2.57	0.22	0.52	0.34				<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.6	1.6	1.3	28.8	2.2	5.2	3.9				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.50	0.23	0.17	2.56	0.29	0.73	0.57				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.20	0.09	0.07	1.00	0.11	0.29	0.22				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	99	97	98	98	98	93				<0	%	TM4/PM8

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/20879

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-7	14-17	18-21	22-24	25-28	29-31					
Sample ID	TP17	TP17	TP18	TP18	WS04	WS08	WS21					
Depth	0.90	1.60	1.50	2.80	0.10	0.00-0.30	0.10					
COC No / misc												
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	03/12/2024	03/12/2024	03/12/2024	03/12/2024	06/12/2024	06/12/2024	06/12/2024					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1					
Date of Receipt	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024	06/12/2024					

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1 SV	<0.1	0.6 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	1.3	<0.2	14.4	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	7	<4	64	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	42	92	<7	233	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	481	1037	<7	1253	35	77	55				<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	27	70	<7	68	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	550	1207	<26	1633	35	77	55				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	2.3	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	27	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	11	13	<7	134	<7	14	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	329	678	55	1091	85	181	159				<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	36	75	12	95	16	21	18				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	376	766	67	1349	101	216	177				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	926	1973	67	2982	136	293	232				<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	<5 SV	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Benzene#	<5	<5 SV	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Toluene#	9	12 SV	<5	16 SV	7	<5	<5				<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5 SV	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5 SV	<5	37 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5 SV	<5	21 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	0.78	<0.15	<0.15	<0.15				<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	27.5	66.5	17.5	105.8	24.8	24.7	23.2				<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	-	<0.6	-	-	-	-	-				<0.6	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)#	-	0.027	-	-	-	-	-				<0.002	g/l	TM38/PM20
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Nitrate as NO3 (2:1 Ext BRE)	-	0.0571	-	-	-	-	-				<0.0025	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)#	0.0561	0.0287	0.0405	0.0971	0.0381	0.0398	0.0364				<0.0015	g/l	TM38/PM20
Total Organic Carbon#	4.44	5.64	2.00	10.52	2.53	3.01	2.57				<0.02	%	TM21/PM24
pH#	6.86	7.08	7.84	8.07	7.18	7.18	6.51				<0.01	pH units	TM73/PM11

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/20879	1	TP17	0.90	3	Emily Smith	13/12/2024	**General Description (Bulk Analysis)**	Brown soil
					Emily Smith	13/12/2024	**Asbestos Fibres**	NAD
					Emily Smith	13/12/2024	**Asbestos ACM**	NAD
					Emily Smith	13/12/2024	**Asbestos Type**	NAD
24/20879	1	TP18	1.50	16	Emily Smith	13/12/2024	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Smith	13/12/2024	**Asbestos Fibres**	NAD
					Emily Smith	13/12/2024	**Asbestos ACM**	NAD
					Emily Smith	13/12/2024	**Asbestos Type**	NAD
24/20879	1	WS04	0.10	24	Emily Smith	13/12/2024	**General Description (Bulk Analysis)**	Brown soil
					Emily Smith	13/12/2024	**Asbestos Fibres**	Fibre Bundles
					Emily Smith	13/12/2024	**Asbestos ACM**	NAD
					Emily Smith	13/12/2024	**Asbestos Type**	Chrysotile
					Remigiusz Blichowski	17/12/2024	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	17/12/2024	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	17/12/2024	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	20/12/2024	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					Remigiusz Blichowski	20/12/2024	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
24/20879	1	WS08	0.00-0.30	27	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20879	1	WS21	0.10	31	Simon Postlewhite	16/12/2024	**General Description (Bulk Analysis)**	Brown soil/stones
					Simon Postlewhite	16/12/2024	**Asbestos Fibres**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos ACM**	NAD
					Simon Postlewhite	16/12/2024	**Asbestos Type**	NAD
24/20879	1	WS22	0.10	33	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD

Element Materials Technology

Notification of Deviating Samples

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 24/20879						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/20879

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 24/20879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 24/20879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.			AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 24/20879

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM131	Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

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WA3 6AE

Attention :	Adrian Read
Date :	23rd December, 2024
Your reference :	TE1890
Our reference :	Test Report 24/21127 Batch 1
Location :	Plot 2, Marchwiel, Wrexham
Date samples received :	10th December, 2024
Status :	Final Report
Issue :	202412231214

Seven samples were received for analysis on 10th December, 2024 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 20.924 kg of CO2

Scope 1&2&3 emissions - 49.448 kg of CO2

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/21127

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	7-9	10-12	13-15	16-18	19					LOD/LOR	Units	Method No.
Sample ID	WS09	WS23	WS24	WS25	WS26	WS26							
Depth	0.10	0.10	0.10	0.10	0.10	1.50							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	T							
Sample Date	09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024							
Arsenic #	13.2	13.6	11.8	13.7	11.8	-					<0.5	mg/kg	TM30/PM15
Cadmium #	2.3	2.0	2.1	1.5	1.5	-					<0.1	mg/kg	TM30/PM15
Chromium #	328.2 AA	175.3	378.1 AA	173.8	186.2	-					<0.5	mg/kg	TM30/PM15
Copper #	90	70	85	50	56	-					<1	mg/kg	TM30/PM15
Lead #	271	232	209	176	177	-					<5	mg/kg	TM30/PM15
Mercury #	2.1	1.4	1.2	0.7	0.9	-					<0.1	mg/kg	TM30/PM15
Nickel #	17.8	15.4	16.8	14.8	17.9	-					<0.7	mg/kg	TM30/PM15
Selenium #	2	2	2	2	1	-					<1	mg/kg	TM30/PM15
Sulphur as S	-	-	-	-	-	0.02					<0.01	%	TM30/PM15
Total Sulphate as SO4 #	1639	1334	1119	1069	950	-					<50	mg/kg	TM50/PM29
Total Sulphate as SO4 BRE	-	-	-	-	-	0.02					<0.01	%	TM50/PM29
Zinc #	402	303	321	222	253	-					<5	mg/kg	TM30/PM15
Magnesium	-	-	-	-	-	0.0024					<0.0001	g/l	TM30/PM20
PAH MS													
Naphthalene #	0.16	0.10	0.06	0.06	0.07	-					<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.30	0.16	0.11	0.05	0.07	-					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	-					<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	-					<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.42	0.25	0.20	0.12	0.14	-					<0.03	mg/kg	TM4/PM8
Anthracene #	0.19	0.11	0.08	<0.04	0.05	-					<0.04	mg/kg	TM4/PM8
Fluoranthene #	1.09	0.85	0.44	0.29	0.29	-					<0.03	mg/kg	TM4/PM8
Pyrene #	1.00	0.78	0.39	0.26	0.28	-					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.76	0.67	0.33	0.22	0.20	-					<0.06	mg/kg	TM4/PM8
Chrysene #	0.90	0.81	0.40	0.31	0.29	-					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.90	1.64	0.74	0.54	0.50	-					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	1.10	0.91	0.39	0.21	0.20	-					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	1.09	0.86	0.43	0.27	0.28	-					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.18	0.15	0.08	0.06	0.05	-					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	1.09	0.83	0.44	0.32	0.29	-					<0.04	mg/kg	TM4/PM8
PAH 16 Total	10.2	8.1	4.1	2.7	2.7	-					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	1.37	1.18	0.53	0.39	0.36	-					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.53	0.46	0.21	0.15	0.14	-					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	96	96	96	90	94	-					<0	%	TM4/PM8

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read
EMT Job No: 24/21127

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	7-9	10-12	13-15	16-18	19							
Sample ID	WS09	WS23	WS24	WS25	WS26	WS26							
Depth	0.10	0.10	0.10	0.10	0.10	1.50							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	T							
Sample Date	09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024	09/12/2024							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024	10/12/2024							

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	5.3	6.9	6.5	<0.2	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	15	19	19	<4	<4	-					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	14	21	15	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	87	72	71	52	36	-					<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	121	119	112	52	36	-					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	-					<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	<0.2	<0.2	-					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4	-					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	30	35	<7	<7	<7	-					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	251	264	145	124	113	-					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	25	25	15	12	8	-					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	306	324	160	136	121	-					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	427	443	272	188	157	-					<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5	-					<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	-					<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	26.7	23.4	25.9	24.8	19.8	21.2					<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	-	-	-	-	-	<0.6					<0.6	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)#	-	-	-	-	-	0.003					<0.002	g/l	TM38/PM20
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3	<0.3	-					<0.3	mg/kg	TM38/PM20
Nitrate as NO3 (2:1 Ext BRE)	-	-	-	-	-	0.0060					<0.0025	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)#	0.0317	0.0339	0.0239	0.0254	0.0277	0.0223					<0.0015	g/l	TM38/PM20
Total Organic Carbon#	4.77	3.83	4.06	3.21	3.14	-					<0.02	%	TM21/PM24
pH#	6.58	6.79	6.66	7.33	6.80	8.10					<0.01	pH units	TM73/PM11

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
24/21127	1	WS09	0.10	3	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/21127	1	WS10	0.10	6	Michael Reilly	13/12/2024	**General Description (Bulk Analysis)**	Brown soil, stones
					Michael Reilly	13/12/2024	**Asbestos Fibres**	NAD
					Michael Reilly	13/12/2024	**Asbestos ACM**	NAD
					Michael Reilly	13/12/2024	**Asbestos Type**	NAD
24/21127	1	WS23	0.10	9	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/21127	1	WS24	0.10	12	Michael Reilly	13/12/2024	**General Description (Bulk Analysis)**	Brown soil, stones
					Michael Reilly	13/12/2024	**Asbestos Fibres**	Fibre Bundles
					Michael Reilly	13/12/2024	**Asbestos ACM**	NAD
					Michael Reilly	13/12/2024	**Asbestos Type**	Chrysotile
					Remigiusz Blichowski	17/12/2024	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	17/12/2024	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	17/12/2024	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
					Remigiusz Blichowski	20/12/2024	**Asbestos PCOM Quantification (Fibres)**	<0.001 (mass %)
					Remigiusz Blichowski	20/12/2024	**Asbestos Gravimetric & PCOM Total**	<0.001 (mass %)
24/21127	1	WS25	0.10	15	Anthony Carman	16/12/2024	**General Description (Bulk Analysis)**	Brown Soil/Stones
					Anthony Carman	16/12/2024	**Asbestos Fibres**	NAD
					Anthony Carman	16/12/2024	**Asbestos ACM**	NAD
					Anthony Carman	16/12/2024	**Asbestos Type**	NAD
24/21127	1	WS26	0.10	18	Emily Smith	13/12/2024	**General Description (Bulk Analysis)**	Brown soil
					Emily Smith	13/12/2024	**Asbestos Fibres**	NAD
					Emily Smith	13/12/2024	**Asbestos ACM**	NAD
					Emily Smith	13/12/2024	**Asbestos Type**	NAD

Element Materials Technology

Notification of Deviating Samples

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Adrian Read

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 24/21127						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/21127

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 24/21127

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 24/21127

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.			AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

EMT Job No: 24/21127

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM131	Quantification of Asbestos Fibres and ACM based on HSG 248 Second edition:2021, HSG 264 Second edition:2012, HSE Contract Research Report No.83/1996, MDHS 87:1998, WM3 1st Edition v1.1:2018	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes

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Birchwood
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WA3 6AE

Attention :	Sean Lee
Date :	7th January, 2025
Your reference :	TE1890
Our reference :	Test Report 24/21537 Batch 1
Location :	Plot 2, Marchwel
Date samples received :	16th December, 2024
Status :	Final Report
Issue :	202501071515

Five samples were received for analysis on 16th December, 2024 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 25.268 kg of CO2

Scope 1&2&3 emissions - 59.714 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwel
Contact: Sean Lee
EMT Job No: 24/21537

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8	9-12	13-16	17-20						LOD/LOR	Units	Method No.
Sample ID	CP03	CP04	CP09	CP13	CP15								
Depth	1.00	0.80	0.90	1.00	0.80								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	11/12/2024	11/12/2024	13/12/2024	13/12/2024	13/12/2024								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	16/12/2024	16/12/2024	16/12/2024	16/12/2024	16/12/2024								
Arsenic #	10.4	8.2	9.4	13.0	3.1						<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	0.4	0.3	0.6	0.2						<0.1	mg/kg	TM30/PM15
Chromium #	41.5	79.3	74.0	122.9	50.1						<0.5	mg/kg	TM30/PM15
Copper #	26	18	16	39	10						<1	mg/kg	TM30/PM15
Lead #	40	48	49	95	42						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	0.2	<0.1						<0.1	mg/kg	TM30/PM15
Nickel #	39.2	18.3	17.2	40.8	8.3						<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	<1	<1	<1						<1	mg/kg	TM30/PM15
Sulphur as S	0.02	0.03	0.02	0.03	0.03						<0.01	%	TM30/PM15
Total Sulphate as SO4 #	223	283	306	415	181						<50	mg/kg	TM50/PM29
Total Sulphate as SO4 BRE	0.02	0.03	0.03	0.04	0.02						<0.01	%	TM50/PM29
Zinc #	90	119	77	175	52						<5	mg/kg	TM30/PM15
Magnesium	0.0151	0.0023	0.0019	0.0030	0.0020						<0.0001	g/l	TM30/PM20
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	0.05	0.06	0.05						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.06	0.11	0.15	0.09						<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.06	0.10	0.14	0.09						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	0.10	0.11	0.09						<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.07	0.11	0.11	0.09						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.12	0.22	0.20	0.18						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.06	0.11	0.10	0.09						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.07	0.11	0.10	0.09						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.06	0.11	0.10	0.09						<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	1.0	1.1	0.9						<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.09	0.16	0.14	0.13						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.03	0.06	0.06	0.05						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	72	98	97	75	98						<0	%	TM4/PM8

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwel
Contact: Sean Lee
EMT Job No: 24/21537

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-4	5-8	9-12	13-16	17-20							
Sample ID	CP03	CP04	CP09	CP13	CP15							
Depth	1.00	0.80	0.90	1.00	0.80							
COC No / misc												
Containers	V J T	V J T	V J T	V J T	V J T							
Sample Date	11/12/2024	11/12/2024	13/12/2024	13/12/2024	13/12/2024							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1							
Date of Receipt	16/12/2024	16/12/2024	16/12/2024	16/12/2024	16/12/2024							
											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	<52	<52	<52						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5						<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15						<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	26.2	17.8	14.0	27.5	14.3						<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	<0.6	<0.6	<0.6	<0.6	<0.6						<0.6	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE)#	0.006	0.008	0.014	0.008	0.009						<0.002	g/l	TM38/PM20
Hexavalent Chromium#	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20
Nitrate as NO3 (2:1 Ext BRE)	<0.0025	0.0336	0.0217	0.0240	0.0062						<0.0025	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)#	0.0148	0.0319	0.0255	0.0365	0.0182						<0.0015	g/l	TM38/PM20
Total Organic Carbon#	0.48	0.54	0.48	1.02	0.32						<0.02	%	TM21/PM24
pH#	8.46	7.41	6.88	7.43	8.15						<0.01	pH units	TM73/PM11

Client Name: Tier Environmental

Reference: TE1890

Location: Plot 2, Marchwel

Contact: Sean Lee

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
24/21537	1	CP03	1.00	1-4	PAH	Sample holding time exceeded
24/21537	1	CP04	0.80	5-8	PAH	Sample holding time exceeded
24/21537	1	CP09	0.90	9-12	PAH	Sample holding time exceeded
24/21537	1	CP13	1.00	13-16	PAH	Sample holding time exceeded
24/21537	1	CP15	0.80	17-20	PAH	Sample holding time exceeded

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

EMT Job No.: 24/21537

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 24/21537

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 24/21537

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013l	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.			AD	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes		AD	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

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WA3 6AE

Attention :	Sean Lee
Date :	9th January, 2025
Your reference :	TE1890
Our reference :	Test Report 24/21741 Batch 1
Location :	Plot 2, Marchwiel
Date samples received :	19th December, 2024
Status :	Final Report
Issue :	202501091519

Fourteen samples were received for analysis on 19th December, 2024 of which fourteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 34.969 kg of CO2

Scope 1&2&3 emissions - 82.641 kg of CO2

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel
Contact: Sean Lee
EMT Job No: 24/21741

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1	2	3	4	5	6	7	8	9	10	LOD/LOR	Units	Method No.
Sample ID	CP01	CP02	CP06	CP06	CP07	CP08	CP08	CP10	CP11	CP12			
Depth	1.00	1.00	1.00	2.00-2.45	0.50	1.00	2.50	0.70	1.00	0.70			
COC No / misc													
Containers	T	T	T	T	T	T	T	T	T	T			
Sample Date	<>	<>	<>	<>	<>	<>	<>	<>	<>	<>			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024	19/12/2024			
Sulphur as S	0.02	0.01	0.03	0.02	0.02	0.04	0.17	0.03	0.02	0.06	<0.01	%	TM30/PM15
Total Sulphate as SO4 BRE	0.02	<0.01	0.03	0.01	0.02	0.04	0.05	0.01	0.01	0.08	<0.01	%	TM50/PM29
Magnesium	0.0010	0.0025	0.0013	0.0025	0.0013	0.0027	0.0029	0.0032	0.0032	0.0022	<0.0001	g/l	TM30/PM20
Natural Moisture Content	12.6	17.2	18.9	19.1	15.5	22.2	18.5	18.0	17.0	21.4	<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE) #	0.008	0.008	0.006	0.008	0.006	0.008	0.006	0.007	0.006	0.008	<0.002	g/l	TM38/PM20
Nitrate as NO3 (2:1 Ext BRE)	0.0073	0.0085	0.0152	0.0111	0.0134	0.0213	<0.0025	<0.0025	<0.0025	0.0227	<0.0025	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0119	0.0137	0.0265	0.0150	0.0193	0.0204	0.0400	0.0228	0.0353	0.0511	<0.0015	g/l	TM38/PM20
pH #	6.97	7.47	7.36	7.99	6.87	7.91	8.49	8.46	8.08	7.23	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel
Contact: Sean Lee
EMT Job No: 24/21741

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	11	12	13	14							LOD/LOR	Units	Method No.
Sample ID	CP14	CP16	CP17	CP18									
Depth	1.20-1.65	0.50	0.70	0.60									
COC No / misc													
Containers	T	T	T	T									
Sample Date	<>	<>	<>	<>									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	19/12/2024	19/12/2024	19/12/2024	19/12/2024									
Sulphur as S	0.02	0.02	0.02	0.01							<0.01	%	TM30/PM15
Total Sulphate as SO4 BRE	0.01	<0.01	0.01	0.01							<0.01	%	TM50/PM29
Magnesium	0.0016	0.0026	0.0028	0.0017							<0.0001	g/l	TM30/PM20
Natural Moisture Content	18.3	15.5	15.4	15.4							<0.1	%	PM4/PM0
Ammoniacal Nitrogen as NH4	2.2	2.7	<0.6	<0.6							<0.6	mg/kg	TM38/PM20
Chloride (2:1 Ext BRE) #	0.002	0.004	0.009	0.003							<0.002	g/l	TM38/PM20
Nitrate as NO3 (2:1 Ext BRE)	<0.0025	0.0096	0.0040	0.0089							<0.0025	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0140	0.0280	0.0258	0.0331							<0.0015	g/l	TM38/PM20
pH #	7.74	8.26	7.82	7.51							<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Tier Environmental

Matrix : Solid

Reference: TE1890

Location: Plot 2, Marchwiel

Contact: Sean Lee

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
24/21741	1	CP01	1.00	1	All analyses	No sampling date given
24/21741	1	CP02	1.00	2	All analyses	No sampling date given
24/21741	1	CP06	1.00	3	All analyses	No sampling date given
24/21741	1	CP06	2.00-2.45	4	All analyses	No sampling date given
24/21741	1	CP07	0.50	5	All analyses	No sampling date given
24/21741	1	CP08	1.00	6	All analyses	No sampling date given
24/21741	1	CP08	2.50	7	All analyses	No sampling date given
24/21741	1	CP10	0.70	8	All analyses	No sampling date given
24/21741	1	CP11	1.00	9	All analyses	No sampling date given
24/21741	1	CP12	0.70	10	All analyses	No sampling date given
24/21741	1	CP14	1.20-1.65	11	All analyses	No sampling date given
24/21741	1	CP16	0.50	12	All analyses	No sampling date given
24/21741	1	CP17	0.70	13	All analyses	No sampling date given
24/21741	1	CP18	0.60	14	All analyses	No sampling date given

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 24/21741

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 24/21741

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35 degrees Celsius or 105 degrees Celsius. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 degrees Celsius. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.			AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.			AD	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

Waste Classification Report

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

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

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

U4I1I-DPOSH-UD2CV

Report is invalid if pages are removed.

Job name

EMT-24-20663-Batch-1-202412171427

Description/Comments

Project

TE1890

Site

Plot 2, Marchwiel, Wrexham

Classified by

Name:
Adrian Read
Date:
29 Jan 2025 16:12 GMT
Telephone:
01925 818388

Company:
Tier Environmental
Suite 414
Chadwick House
Warrington
WA3 6AE

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	03 Dec 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales **Post Code** LL13 0SQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Proposed redevelopment of land

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

Waste created during excavation of soils during development

Description of the waste

Made ground and/or natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	3
2	WS02-04/12/2024-0.00-0.35m		Non Hazardous		5
3	WS03-04/12/2024-0.00-0.30m		Non Hazardous		7
4	WS05-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	9
5	WS06-04/12/2024-0.00-0.30m		Non Hazardous		11
6	WS11-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	13
7	WS12-04/12/2024-0.00-0.35m		Potentially Hazardous	HP 3(i)	15
8	WS13-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	17
9	WS14-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	19
10	WS16-04/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	21

Related documents

#	Name	Description
1	EMT-24-20663-Batch-1-202412171427.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Adrian Read

Created date: 29 Jan 2025 16:12 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	23
Appendix B: Rationale for selection of metal species	24
Appendix C: Version	24

Classification of sample: WS01-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS01-04/12/2024-0.00-0.30m
Moisture content:
28.2%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0163%)

Determinands

Moisture content: 28.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.2 mg/kg	1.32	10.505 mg/kg	0.00105 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.9 mg/kg	1.142	1.693 mg/kg	0.000169 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		325.2 mg/kg	1.462	370.747 mg/kg	0.0371 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		74 mg/kg	1.126	64.989 mg/kg	0.0065 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	225 mg/kg	1.56	273.759 mg/kg	0.0176 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.3 mg/kg	1.353	1.372 mg/kg	0.000137 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.9 mg/kg	2.976	36.913 mg/kg	0.00369 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	3.984 mg/kg	0.000398 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		293 mg/kg	2.774	634.029 mg/kg	0.0634 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		209 mg/kg		163.027 mg/kg	0.0163 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		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									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				6.52	pH		6.52	pH	6.52 pH		
				PH									
18		naphthalene				0.09	mg/kg		0.0702	mg/kg	0.00000702 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.22	mg/kg		0.172	mg/kg	0.0000172 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.24	mg/kg		0.187	mg/kg	0.0000187 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.14	mg/kg		0.109	mg/kg	0.0000109 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				0.64	mg/kg		0.499	mg/kg	0.0000499 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.62	mg/kg		0.484	mg/kg	0.0000484 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.51	mg/kg		0.398	mg/kg	0.0000398 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.68	mg/kg		0.53	mg/kg	0.000053 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.91	mg/kg		0.71	mg/kg	0.000071 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.36	mg/kg		0.281	mg/kg	0.0000281 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.69	mg/kg		0.538	mg/kg	0.0000538 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.65	mg/kg		0.507	mg/kg	0.0000507 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.14	mg/kg		0.109	mg/kg	0.0000109 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.63	mg/kg		0.491	mg/kg	0.0000491 %	✓	
			205-883-8	191-24-2									
										Total:	0.147 %		

Key

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

Classification of sample: WS02-04/12/2024-0.00-0.35m

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

Sample details

Sample name:
WS02-04/12/2024-0.00-0.35m
Moisture content:
420.1%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 420.1% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.5 mg/kg	1.32	2.412 mg/kg	0.000241 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3 mg/kg	1.142	0.0659 mg/kg	0.00000659 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		63.5 mg/kg	1.462	17.844 mg/kg	0.00178 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21 mg/kg	1.126	4.546 mg/kg	0.000455 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	65 mg/kg	1.56	19.494 mg/kg	0.00125 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.1 mg/kg	2.976	10.358 mg/kg	0.00104 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	0.982 mg/kg	0.0000982 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		109 mg/kg	2.774	58.139 mg/kg	0.00581 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
16	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
17		pH		PH		7.36	pH		7.36	pH	7.36 pH		
18		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
19		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
20		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
23		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
24		fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
25		pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
26		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
31		indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
33		benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
										Total:	0.016 %		

Key

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

Classification of sample: WS03-04/12/2024-0.00-0.30m

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

Sample details

Sample name:
WS03-04/12/2024-0.00-0.30m
Moisture content:
29%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 29% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.9 mg/kg	1.32	9.109 mg/kg	0.000911 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.443 mg/kg	0.0000443 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		64 mg/kg	1.462	72.511 mg/kg	0.00725 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		20 mg/kg	1.126	17.456 mg/kg	0.00175 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	95 mg/kg	1.56	114.87 mg/kg	0.00736 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.2 mg/kg	1.353	0.21 mg/kg	0.000021 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.7 mg/kg	2.976	43.144 mg/kg	0.00431 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		140 mg/kg	2.774	301.07 mg/kg	0.0301 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
17	●	pH		PH		7.1	pH		7.1	pH	7.1 pH		
18		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
22	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
23	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
24	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
25	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
26		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
										Total:	0.0573 %		

Key

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

Classification of sample: WS05-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS05-04/12/2024-0.00-0.30m
Moisture content:
30.4%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0129%)

Determinands

Moisture content: 30.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.8 mg/kg	1.32	10.935 mg/kg	0.00109 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.2 mg/kg	1.142	2.803 mg/kg	0.00028 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		304.7 mg/kg	1.462	341.515 mg/kg	0.0342 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		72 mg/kg	1.126	62.166 mg/kg	0.00622 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	202 mg/kg	1.56	241.628 mg/kg	0.0155 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1 mg/kg	1.353	1.038 mg/kg	0.000104 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.1 mg/kg	2.976	41.312 mg/kg	0.00413 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	3.917 mg/kg	0.000392 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		347 mg/kg	2.774	738.212 mg/kg	0.0738 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		168 mg/kg		128.834 mg/kg	0.0129 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		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									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15	•	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	•	pH				6.85	pH		6.85	pH	6.85 pH		
				PH									
18		naphthalene				0.07	mg/kg		0.0537	mg/kg	0.00000537 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	•	acenaphthylene				0.09	mg/kg		0.069	mg/kg	0.0000069 %	✓	
			205-917-1	208-96-8									
20	•	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	•	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	•	phenanthrene				0.14	mg/kg		0.107	mg/kg	0.0000107 %	✓	
			201-581-5	85-01-8									
23	•	anthracene				0.07	mg/kg		0.0537	mg/kg	0.00000537 %	✓	
			204-371-1	120-12-7									
24	•	fluoranthene				0.42	mg/kg		0.322	mg/kg	0.0000322 %	✓	
			205-912-4	206-44-0									
25	•	pyrene				0.38	mg/kg		0.291	mg/kg	0.0000291 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.34	mg/kg		0.261	mg/kg	0.0000261 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.42	mg/kg		0.322	mg/kg	0.0000322 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.55	mg/kg		0.422	mg/kg	0.0000422 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.22	mg/kg		0.169	mg/kg	0.0000169 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.43	mg/kg		0.33	mg/kg	0.000033 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	•	indeno[123-cd]pyrene				0.42	mg/kg		0.322	mg/kg	0.0000322 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.07	mg/kg		0.0537	mg/kg	0.00000537 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	•	benzo[ghi]perylene				0.39	mg/kg		0.299	mg/kg	0.0000299 %	✓	
			205-883-8	191-24-2									
										Total:	0.149 %		

Key

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

Classification of sample: WS06-04/12/2024-0.00-0.30m

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

Sample details

Sample name:
WS06-04/12/2024-0.00-0.30m
Moisture content:
23.8%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 23.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	9.279 mg/kg	0.000928 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1 mg/kg	1.142	1.015 mg/kg	0.000101 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		84.5 mg/kg	1.462	99.759 mg/kg	0.00998 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27 mg/kg	1.126	24.555 mg/kg	0.00246 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	92 mg/kg	1.56	115.915 mg/kg	0.00743 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.3 mg/kg	1.353	0.328 mg/kg	0.0000328 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.3 mg/kg	2.976	43.995 mg/kg	0.0044 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		148 mg/kg	2.774	331.643 mg/kg	0.0332 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
16	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2]	95-47-6 [1] 106-42-3 [2]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
			203-576-3 [3] 215-535-7 [4]	108-38-3 [3] 1330-20-7 [4]									
17	●	pH		PH		7.04	pH		7.04	pH	7.04 pH		
18		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
22	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
23	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
24	●	fluoranthene				0.09	mg/kg		0.0727	mg/kg	0.00000727 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.09	mg/kg		0.0727	mg/kg	0.00000727 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.09	mg/kg		0.0727	mg/kg	0.00000727 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.09	mg/kg		0.0727	mg/kg	0.00000727 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.11	mg/kg		0.0889	mg/kg	0.00000889 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.04	mg/kg		0.0323	mg/kg	0.00000323 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.09	mg/kg		0.0727	mg/kg	0.00000727 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.07	mg/kg		0.0565	mg/kg	0.00000565 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.07	mg/kg		0.0565	mg/kg	0.00000565 %	✓	
			205-883-8	191-24-2									
										Total:	0.0641 %		

Key

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

Classification of sample: WS11-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS11-04/12/2024-0.00-0.30m
Moisture content:
24.9%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00592%)

Determinands

Moisture content: 24.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12.3 mg/kg	1.32	13.002 mg/kg	0.0013 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.3 mg/kg	1.142	1.189 mg/kg	0.000119 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		370.5 mg/kg	1.462	433.552 mg/kg	0.0434 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		62 mg/kg	1.126	55.889 mg/kg	0.00559 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	186 mg/kg	1.56	232.286 mg/kg	0.0149 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1 mg/kg	1.353	1.084 mg/kg	0.000108 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16.3 mg/kg	2.976	38.842 mg/kg	0.00388 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.089 mg/kg	0.000409 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		265 mg/kg	2.774	588.59 mg/kg	0.0589 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		74 mg/kg		59.247 mg/kg	0.00592 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		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									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				7.09	pH		7.09	pH	7.09 pH		
				PH									
18		naphthalene				0.07	mg/kg		0.056	mg/kg	0.0000056 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.09	mg/kg		0.0721	mg/kg	0.00000721 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.17	mg/kg		0.136	mg/kg	0.0000136 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.07	mg/kg		0.056	mg/kg	0.0000056 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				0.45	mg/kg		0.36	mg/kg	0.000036 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.41	mg/kg		0.328	mg/kg	0.0000328 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.42	mg/kg		0.336	mg/kg	0.0000336 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.42	mg/kg		0.336	mg/kg	0.0000336 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.61	mg/kg		0.488	mg/kg	0.0000488 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.24	mg/kg		0.192	mg/kg	0.0000192 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.49	mg/kg		0.392	mg/kg	0.0000392 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.4	mg/kg		0.32	mg/kg	0.000032 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.09	mg/kg		0.0721	mg/kg	0.00000721 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.4	mg/kg		0.32	mg/kg	0.000032 %	✓	
			205-883-8	191-24-2									
										Total:	0.135 %		

Key

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

Classification of sample: WS12-04/12/2024-0.00-0.35m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS12-04/12/2024-0.00-0.35m
Moisture content:
33.9%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00523%)

Determinands

Moisture content: 33.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12.2 mg/kg	1.32	12.03 mg/kg	0.0012 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8 mg/kg	1.142	1.536 mg/kg	0.000154 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		242.9 mg/kg	1.462	265.132 mg/kg	0.0265 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		63 mg/kg	1.126	52.973 mg/kg	0.0053 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	212 mg/kg	1.56	246.961 mg/kg	0.0158 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.2 mg/kg	1.353	1.213 mg/kg	0.000121 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16.2 mg/kg	2.976	36.009 mg/kg	0.0036 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	1.907 mg/kg	0.000191 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		294 mg/kg	2.774	609.111 mg/kg	0.0609 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		70 mg/kg		52.278 mg/kg	0.00523 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		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									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15	•	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	•	pH				7.03	pH		7.03	pH	7.03 pH		
				PH									
18		naphthalene				0.08	mg/kg		0.0597	mg/kg	0.00000597 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	•	acenaphthylene				0.13	mg/kg		0.0971	mg/kg	0.00000971 %	✓	
			205-917-1	208-96-8									
20	•	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	•	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	•	phenanthrene				0.17	mg/kg		0.127	mg/kg	0.0000127 %	✓	
			201-581-5	85-01-8									
23	•	anthracene				0.08	mg/kg		0.0597	mg/kg	0.00000597 %	✓	
			204-371-1	120-12-7									
24	•	fluoranthene				0.6	mg/kg		0.448	mg/kg	0.0000448 %	✓	
			205-912-4	206-44-0									
25	•	pyrene				0.55	mg/kg		0.411	mg/kg	0.0000411 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.51	mg/kg		0.381	mg/kg	0.0000381 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.58	mg/kg		0.433	mg/kg	0.0000433 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.87	mg/kg		0.65	mg/kg	0.000065 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.34	mg/kg		0.254	mg/kg	0.0000254 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.71	mg/kg		0.53	mg/kg	0.000053 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	•	indeno[123-cd]pyrene				0.58	mg/kg		0.433	mg/kg	0.0000433 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.13	mg/kg		0.0971	mg/kg	0.00000971 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	•	benzo[ghi]perylene				0.55	mg/kg		0.411	mg/kg	0.0000411 %	✓	
			205-883-8	191-24-2									
										Total:	0.12 %		

Key

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

Classification of sample: WS13-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS13-04/12/2024-0.00-0.30m
Moisture content:
29.8%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 3.08e-06%)

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.00886%)

Determinands

Moisture content: 29.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.9 mg/kg	1.32	15.156 mg/kg	0.00152 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2 mg/kg	1.142	1.76 mg/kg	0.000176 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		295.6 mg/kg	1.462	332.847 mg/kg	0.0333 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		67 mg/kg	1.126	58.116 mg/kg	0.00581 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	231 mg/kg	1.56	277.594 mg/kg	0.0178 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.7 mg/kg	1.353	1.773 mg/kg	0.000177 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		19.4 mg/kg	2.976	44.483 mg/kg	0.00445 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	3.935 mg/kg	0.000394 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		329 mg/kg	2.774	703.154 mg/kg	0.0703 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		115 mg/kg		88.598 mg/kg	0.00886 %	✓	

#		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		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				0.04	mg/kg		0.0308	mg/kg	0.00000308 %	✓	
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				6.96	pH		6.96	pH	6.96 pH		
				PH									
18		naphthalene				0.09	mg/kg		0.0693	mg/kg	0.00000693 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.12	mg/kg		0.0924	mg/kg	0.00000924 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.23	mg/kg		0.177	mg/kg	0.0000177 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.1	mg/kg		0.077	mg/kg	0.0000077 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				0.61	mg/kg		0.47	mg/kg	0.000047 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.57	mg/kg		0.439	mg/kg	0.0000439 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.44	mg/kg		0.339	mg/kg	0.0000339 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.55	mg/kg		0.424	mg/kg	0.0000424 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.89	mg/kg		0.686	mg/kg	0.0000686 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.34	mg/kg		0.262	mg/kg	0.0000262 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.67	mg/kg		0.516	mg/kg	0.0000516 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.65	mg/kg		0.501	mg/kg	0.0000501 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.13	mg/kg		0.1	mg/kg	0.00001 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.65	mg/kg		0.501	mg/kg	0.0000501 %	✓	
			205-883-8	191-24-2									
										Total:	0.143 %		

Key

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

Classification of sample: WS14-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS14-04/12/2024-0.00-0.30m
Moisture content:
31.4%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 9.13e-07%)

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0145%)

Determinands

Moisture content: 31.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.4 mg/kg	1.32	14.469 mg/kg	0.00145 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8 mg/kg	1.142	1.565 mg/kg	0.000156 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		345.4 mg/kg	1.462	384.187 mg/kg	0.0384 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		71 mg/kg	1.126	60.836 mg/kg	0.00608 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	243 mg/kg	1.56	288.459 mg/kg	0.0185 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.8 mg/kg	1.353	1.854 mg/kg	0.000185 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.5 mg/kg	2.976	41.903 mg/kg	0.00419 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	1.944 mg/kg	0.000194 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		320 mg/kg	2.774	675.591 mg/kg	0.0676 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		190 mg/kg		144.597 mg/kg	0.0145 %	✓	

#		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		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				0.012	mg/kg		0.0091	mg/kg	0.000000913 %	✓	
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				6.79	pH		6.79	pH	6.79 pH		
				PH									
18		naphthalene				0.08	mg/kg		0.0609	mg/kg	0.00000609 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.14	mg/kg		0.107	mg/kg	0.0000107 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.22	mg/kg		0.167	mg/kg	0.0000167 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.12	mg/kg		0.0913	mg/kg	0.00000913 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				0.54	mg/kg		0.411	mg/kg	0.0000411 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.51	mg/kg		0.388	mg/kg	0.0000388 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.43	mg/kg		0.327	mg/kg	0.0000327 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.53	mg/kg		0.403	mg/kg	0.0000403 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.78	mg/kg		0.594	mg/kg	0.0000594 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.31	mg/kg		0.236	mg/kg	0.0000236 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.62	mg/kg		0.472	mg/kg	0.0000472 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.62	mg/kg		0.472	mg/kg	0.0000472 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.09	mg/kg		0.0685	mg/kg	0.00000685 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.58	mg/kg		0.441	mg/kg	0.0000441 %	✓	
			205-883-8	191-24-2									
										Total:	0.152 %		

Key

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

Classification of sample: WS16-04/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS16-04/12/2024-0.00-0.30m
Moisture content:
26%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 8.73e-07%)

Determinands

Moisture content: 26% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.9 mg/kg	1.32	12.47 mg/kg	0.00125 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3 mg/kg	1.142	2.72 mg/kg	0.000272 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		657.4 mg/kg	1.462	762.561 mg/kg	0.0763 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		87 mg/kg	1.126	77.74 mg/kg	0.00777 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	234 mg/kg	1.56	289.68 mg/kg	0.0186 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.6 mg/kg	1.353	1.719 mg/kg	0.000172 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		19.6 mg/kg	2.976	46.297 mg/kg	0.00463 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.054 mg/kg	0.000405 %	✓	
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		386 mg/kg	2.774	849.858 mg/kg	0.085 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		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									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				0.011	mg/kg		0.0087	mg/kg	0.000000873 %	✓	
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				6.83	pH		6.83	pH	6.83 pH		
				PH									
18		naphthalene				0.05	mg/kg		0.0397	mg/kg	0.00000397 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.06	mg/kg		0.0476	mg/kg	0.00000476 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.1	mg/kg		0.0794	mg/kg	0.00000794 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
24	●	fluoranthene				0.24	mg/kg		0.19	mg/kg	0.000019 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.23	mg/kg		0.183	mg/kg	0.0000183 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.18	mg/kg		0.143	mg/kg	0.0000143 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.23	mg/kg		0.183	mg/kg	0.0000183 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.35	mg/kg		0.278	mg/kg	0.0000278 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.14	mg/kg		0.111	mg/kg	0.0000111 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.24	mg/kg		0.19	mg/kg	0.000019 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.25	mg/kg		0.198	mg/kg	0.0000198 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.05	mg/kg		0.0397	mg/kg	0.00000397 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.25	mg/kg		0.198	mg/kg	0.0000198 %	✓	
			205-883-8	191-24-2									
										Total:	0.2 %		

Key

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

Appendix A: Classifier defined and non GB MCL determinands

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

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

pH (CAS Number: PH)

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

no measured concentrations of hexavalent chromium

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 2025)

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

Waste Classification Report

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

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

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

JU83Y-0QOAJ-LCJ54

Report is invalid if pages are removed.

Job name

EMT-24-20879-Batch-1-202501061510

Description/Comments

Project

TE1890

Site

Plot 2, Marchwiel, Wrexham

Classified by

Name:
Adrian Read
Date:
29 Jan 2025 16:08 GMT
Telephone:
01925 818388

Company:
Tier Environmental
Suite 414
Chadwick House
Warrington
WA3 6AE

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	03 Dec 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales **Post Code** LL13 0SQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Proposed redevelopment of land

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

Waste created during excavation of soils during development

Description of the waste

Made ground and/or natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP17-03/12/2024-0.90m		Potentially Hazardous	HP 3(i)	3
2	TP17-03/12/2024-1.60m		Hazardous	HP 3(i), HP 7, HP 11	5
3	TP18-03/12/2024-1.50m		Potentially Hazardous	HP 3(i)	8
4	TP18-03/12/2024-2.80m		Hazardous	HP 3(i), HP 7, HP 11	10
5	WS04-06/12/2024-0.10m		Potentially Hazardous	HP 3(i)	13
6	WS08-06/12/2024-0.00-0.30m		Potentially Hazardous	HP 3(i)	16
7	WS21-06/12/2024-0.10m		Potentially Hazardous	HP 3(i)	18

Related documents

#	Name	Description
1	EMT-24-20879-Batch-1-202501061510.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Adrian Read

Created date: 29 Jan 2025 16:08 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: TP17-03/12/2024-0.90m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP17-03/12/2024-0.90m
Moisture content:
27.5%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 7.06e-07%)

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0726%)

Determinands

Moisture content: 27.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.3 mg/kg	1.32	11.702 mg/kg	0.00117 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		5.6 mg/kg	1.142	5.017 mg/kg	0.000502 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		575.3 mg/kg	1.462	659.477 mg/kg	0.0659 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		118 mg/kg	1.126	104.2 mg/kg	0.0104 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	285 mg/kg	1.56	348.665 mg/kg	0.0224 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.6 mg/kg	1.353	1.698 mg/kg	0.00017 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24.3 mg/kg	2.976	56.724 mg/kg	0.00567 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.006 mg/kg	0.000401 %	✓	
10	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		560 mg/kg	4.398	1931.638 mg/kg	0.193 %	✓	

#		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									
11	●	TPH (C6 to C40) petroleum group		TPH		926	mg/kg		726.275	mg/kg	0.0726 %	✓	
12		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
13		benzene	601-020-00-8	200-753-7	71-43-2	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
14		toluene	601-021-00-3	203-625-9	108-88-3	0.009	mg/kg		0.007	mg/kg	0.000000706 %	✓	
15	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
16		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**
17	●	pH		PH		6.86	pH		6.86	pH	6.86 pH		
18		naphthalene	601-052-00-2	202-049-5	91-20-3	0.06	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
19	●	acenaphthylene		205-917-1	208-96-8	0.09	mg/kg		0.0706	mg/kg	0.00000706 %	✓	
20	●	acenaphthene		201-469-6	83-32-9	<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21	●	fluorene		201-695-5	86-73-7	<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
22	●	phenanthrene		201-581-5	85-01-8	0.14	mg/kg		0.11	mg/kg	0.000011 %	✓	
23	●	anthracene		204-371-1	120-12-7	0.09	mg/kg		0.0706	mg/kg	0.00000706 %	✓	
24	●	fluoranthene		205-912-4	206-44-0	0.31	mg/kg		0.243	mg/kg	0.0000243 %	✓	
25	●	pyrene		204-927-3	129-00-0	0.28	mg/kg		0.22	mg/kg	0.000022 %	✓	
26		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	0.23	mg/kg		0.18	mg/kg	0.000018 %	✓	
27		chrysene	601-048-00-0	205-923-4	218-01-9	0.29	mg/kg		0.227	mg/kg	0.0000227 %	✓	
28		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	0.5	mg/kg		0.392	mg/kg	0.0000392 %	✓	
29		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	0.2	mg/kg		0.157	mg/kg	0.0000157 %	✓	
30		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	0.38	mg/kg		0.298	mg/kg	0.0000298 %	✓	
31	●	indeno[123-cd]pyrene		205-893-2	193-39-5	0.43	mg/kg		0.337	mg/kg	0.0000337 %	✓	
32		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	0.08	mg/kg		0.0627	mg/kg	0.00000627 %	✓	
33	●	benzo[ghi]perylene		205-883-8	191-24-2	0.48	mg/kg		0.376	mg/kg	0.0000376 %	✓	
										Total:	0.373 %		

Key

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

Classification of sample: TP17-03/12/2024-1.60m

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP17-03/12/2024-1.60m
Moisture content:
66.5%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.118%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.118%)

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 7.21e-07%)

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.118%)

Determinands

Moisture content: 66.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	13.481 mg/kg	0.00135 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3 mg/kg	1.142	2.058 mg/kg	0.000206 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		263.1	mg/kg	1.462	230.952	mg/kg	0.0231 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		108	mg/kg	1.126	73.031	mg/kg	0.0073 %	✓	
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	340	mg/kg	1.56	318.521	mg/kg	0.0204 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		2.6	mg/kg	1.353	2.114	mg/kg	0.000211 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		24.7	mg/kg	2.976	44.152	mg/kg	0.00442 %	✓	
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2	mg/kg	2.554	3.068	mg/kg	0.000307 %	✓	
10		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		553	mg/kg	4.398	1460.693	mg/kg	0.146 %	✓	
11		TPH (C6 to C40) petroleum group			TPH		1973	mg/kg		1184.985	mg/kg	0.118 %	✓	
12		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
13		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
14		toluene	601-021-00-3	203-625-9	108-88-3		0.012	mg/kg		0.0072	mg/kg	0.000000721 %	✓	
15		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		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
17		pH			PH		7.08	pH		7.08	pH	7.08 pH		
18		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
19		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
20		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22		phenanthrene		201-581-5	85-01-8		0.08	mg/kg		0.048	mg/kg	0.0000048 %	✓	
23		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		fluoranthene		205-912-4	206-44-0		0.22	mg/kg		0.132	mg/kg	0.0000132 %	✓	
25		pyrene		204-927-3	129-00-0		0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
26		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
27		chrysene	601-048-00-0	205-923-4	218-01-9		0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
28		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.23	mg/kg		0.138	mg/kg	0.0000138 %	✓	

#		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									
29		benzo[k]fluoranthene				0.09	mg/kg		0.0541	mg/kg	0.00000541 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31		indeno[123-cd]pyrene				0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
33		benzo[ghi]perylene				0.17	mg/kg		0.102	mg/kg	0.0000102 %	✓	
			205-883-8	191-24-2									
34		sulfur { sulfur }				0.17	%		0.102	%	0.102 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.424 %		

Key

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

Classification of sample: TP18-03/12/2024-1.50m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP18-03/12/2024-1.50m
Moisture content:
17.5%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0057%)

Determinands

Moisture content: 17.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.9 mg/kg	1.32	11.124 mg/kg	0.00111 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5 mg/kg	1.142	0.486 mg/kg	0.0000486 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		81.9 mg/kg	1.462	101.874 mg/kg	0.0102 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		31 mg/kg	1.126	29.704 mg/kg	0.00297 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	65 mg/kg	1.56	86.288 mg/kg	0.00553 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21.9 mg/kg	2.976	55.473 mg/kg	0.00555 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	2.173 mg/kg	0.000217 %	✓	
10	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		117 mg/kg	4.398	437.921 mg/kg	0.0438 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		67 mg/kg		57.021 mg/kg	0.0057 %	✓	

#		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		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<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]									
17	●	pH				7.84	pH		7.84	pH	7.84 pH		
				PH									
18		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.05	mg/kg		0.0426	mg/kg	0.00000426 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
22	●	phenanthrene				0.07	mg/kg		0.0596	mg/kg	0.00000596 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
24	●	fluoranthene				0.16	mg/kg		0.136	mg/kg	0.0000136 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.15	mg/kg		0.128	mg/kg	0.0000128 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.14	mg/kg		0.119	mg/kg	0.0000119 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.16	mg/kg		0.136	mg/kg	0.0000136 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.17	mg/kg		0.145	mg/kg	0.0000145 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.07	mg/kg		0.0596	mg/kg	0.00000596 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.14	mg/kg		0.119	mg/kg	0.0000119 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.12	mg/kg		0.102	mg/kg	0.0000102 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.11	mg/kg		0.0936	mg/kg	0.00000936 %	✓	
			205-883-8	191-24-2									
										Total:	0.0753 %		

Key

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

Classification of sample: TP18-03/12/2024-2.80m

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
TP18-03/12/2024-2.80m
Moisture content:
105.8%
(dry weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1B; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.145%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.145%)

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 7.77e-07%)

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

Because of determinands:

TPH (C6 to C40) petroleum group (conc.: 0.145%)
xylene (conc.: 2.82e-06%)

Determinands

Moisture content: 105.8% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17.6 mg/kg	1.32	11.291 mg/kg	0.00113 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		5.5 mg/kg	1.142	3.053 mg/kg	0.000305 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		363.4	mg/kg	1.462	258.08	mg/kg	0.0258 %	✓	
4		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		138	mg/kg	1.126	75.497	mg/kg	0.00755 %	✓	
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	383	mg/kg	1.56	290.286	mg/kg	0.0186 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		3.5	mg/kg	1.353	2.302	mg/kg	0.00023 %	✓	
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		23.7	mg/kg	2.976	34.275	mg/kg	0.00343 %	✓	
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		3	mg/kg	2.554	3.723	mg/kg	0.000372 %	✓	
10		zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		767	mg/kg	4.398	1639.072	mg/kg	0.164 %	✓	
11		TPH (C6 to C40) petroleum group			TPH		2982	mg/kg		1448.98	mg/kg	0.145 %	✓	
12		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
13		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
14		toluene	601-021-00-3	203-625-9	108-88-3		0.016	mg/kg		0.0077	mg/kg	0.000000777 %	✓	
15		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		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]		0.058	mg/kg		0.0282	mg/kg	0.00000282 %	✓	
17		pH			PH		8.07	pH		8.07	pH	8.07 pH		
18		naphthalene	601-052-00-2	202-049-5	91-20-3		1.46	mg/kg		0.709	mg/kg	0.0000709 %	✓	
19		acenaphthylene		205-917-1	208-96-8		0.95	mg/kg		0.462	mg/kg	0.0000462 %	✓	
20		acenaphthene		201-469-6	83-32-9		0.95	mg/kg		0.462	mg/kg	0.0000462 %	✓	
21		fluorene		201-695-5	86-73-7		0.88	mg/kg		0.428	mg/kg	0.0000428 %	✓	
22		phenanthrene		201-581-5	85-01-8		2.88	mg/kg		1.399	mg/kg	0.00014 %	✓	
23		anthracene		204-371-1	120-12-7		1.28	mg/kg		0.622	mg/kg	0.0000622 %	✓	
24		fluoranthene		205-912-4	206-44-0		2.61	mg/kg		1.268	mg/kg	0.000127 %	✓	
25		pyrene		204-927-3	129-00-0		2.39	mg/kg		1.161	mg/kg	0.000116 %	✓	
26		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.46	mg/kg		0.709	mg/kg	0.0000709 %	✓	
27		chrysene	601-048-00-0	205-923-4	218-01-9		1.67	mg/kg		0.811	mg/kg	0.0000811 %	✓	
28		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.56	mg/kg		1.244	mg/kg	0.000124 %	✓	

#		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									
29		benzo[k]fluoranthene				1	mg/kg		0.486	mg/kg	0.0000486 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				2.96	mg/kg		1.438	mg/kg	0.000144 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31		indeno[123-cd]pyrene				2.72	mg/kg		1.322	mg/kg	0.000132 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.49	mg/kg		0.238	mg/kg	0.0000238 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33		benzo[ghi]perylene				2.57	mg/kg		1.249	mg/kg	0.000125 %	✓	
			205-883-8	191-24-2									
										Total:	0.368 %		

Key

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

Classification of sample: WS04-06/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS04-06/12/2024-0.10m
Moisture content:
24.8%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinand:

toluene (conc.: 5.61e-07%)

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0109%)

Determinands

Moisture content: 24.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.3 mg/kg	1.32	9.839 mg/kg	0.000984 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.3 mg/kg	1.142	1.19 mg/kg	0.000119 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		224.5 mg/kg	1.462	262.916 mg/kg	0.0263 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		**<LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		48 mg/kg	1.126	43.303 mg/kg	0.00433 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	150 mg/kg	1.56	187.478 mg/kg	0.012 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.5 mg/kg	1.353	0.542 mg/kg	0.0000542 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17.1 mg/kg	2.976	40.781 mg/kg	0.00408 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	2.046 mg/kg	0.000205 %	✓	
10	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		231 mg/kg	4.398	814.039 mg/kg	0.0814 %	✓	

#		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									
11		TPH (C6 to C40) petroleum group		TPH		136	mg/kg		108.974	mg/kg	0.0109 %	✓	
12		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X											
13		benzene	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8											
14		toluene	203-625-9	108-88-3		0.007	mg/kg		0.0056	mg/kg	0.000000561 %	✓	
		601-021-00-3											
15		ethylbenzene	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4											
16		xylene	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
		601-022-00-9											
17		pH		PH		7.18	pH		7.18	pH	7.18 pH		
18		naphthalene	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2											
19		acenaphthylene	205-917-1	208-96-8		0.09	mg/kg		0.0721	mg/kg	0.00000721 %	✓	
20		acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
21		fluorene	201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
22		phenanthrene	201-581-5	85-01-8		0.11	mg/kg		0.0881	mg/kg	0.00000881 %	✓	
23		anthracene	204-371-1	120-12-7		0.05	mg/kg		0.0401	mg/kg	0.00000401 %	✓	
24		fluoranthene	205-912-4	206-44-0		0.21	mg/kg		0.168	mg/kg	0.0000168 %	✓	
25		pyrene	204-927-3	129-00-0		0.2	mg/kg		0.16	mg/kg	0.000016 %	✓	
26		benzo[a]anthracene	200-280-6	56-55-3		0.17	mg/kg		0.136	mg/kg	0.0000136 %	✓	
		601-033-00-9											
27		chrysene	205-923-4	218-01-9		0.24	mg/kg		0.192	mg/kg	0.0000192 %	✓	
		601-048-00-0											
28		benzo[b]fluoranthene	205-911-9	205-99-2		0.29	mg/kg		0.232	mg/kg	0.0000232 %	✓	
		601-034-00-4											
29		benzo[k]fluoranthene	205-916-6	207-08-9		0.11	mg/kg		0.0881	mg/kg	0.00000881 %	✓	
		601-036-00-5											
30		benzo[a]pyrene; benzo[def]chrysene	200-028-5	50-32-8		0.21	mg/kg		0.168	mg/kg	0.0000168 %	✓	
		601-032-00-3											
31		indeno[123-cd]pyrene	205-893-2	193-39-5		0.22	mg/kg		0.176	mg/kg	0.0000176 %	✓	
32		dibenz[a,h]anthracene	200-181-8	53-70-3		0.05	mg/kg		0.0401	mg/kg	0.00000401 %	✓	
		601-041-00-2											
33		benzo[ghi]perylene	205-883-8	191-24-2		0.22	mg/kg		0.176	mg/kg	0.0000176 %	✓	
34		asbestos	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5		<0.001	%		<0.001	%	<0.001 %		<LOD
		650-013-00-6											
										Total:	0.142 %		

Key

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

Classification of sample: WS08-06/12/2024-0.00-0.30m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS08-06/12/2024-0.00-0.30m
Moisture content:
24.7%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0235%)

Determinands

Moisture content: 24.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.6 mg/kg	1.32	11.223 mg/kg	0.00112 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.4 mg/kg	1.142	2.199 mg/kg	0.00022 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		370.3 mg/kg	1.462	434.013 mg/kg	0.0434 %	✓	
4	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		73 mg/kg	1.126	65.91 mg/kg	0.00659 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	195 mg/kg	1.56	243.917 mg/kg	0.0156 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.9 mg/kg	1.353	0.977 mg/kg	0.0000977 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16.2 mg/kg	2.976	38.665 mg/kg	0.00387 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.096 mg/kg	0.00041 %	✓	
10	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		337 mg/kg	4.398	1188.533 mg/kg	0.119 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		293 mg/kg		234.964 mg/kg	0.0235 %	✓	

#		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		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		603-181-00-X	216-653-1	1634-04-4									
13		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
15	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
17	●	pH				7.18	pH		7.18	pH	7.18 pH		
				PH									
18		naphthalene				0.07	mg/kg		0.0561	mg/kg	0.00000561 %	✓	
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.17	mg/kg		0.136	mg/kg	0.0000136 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
21	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
22	●	phenanthrene				0.19	mg/kg		0.152	mg/kg	0.0000152 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.1	mg/kg		0.0802	mg/kg	0.00000802 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				0.54	mg/kg		0.433	mg/kg	0.0000433 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				0.51	mg/kg		0.409	mg/kg	0.0000409 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				0.41	mg/kg		0.329	mg/kg	0.0000329 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				0.47	mg/kg		0.377	mg/kg	0.0000377 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				0.73	mg/kg		0.585	mg/kg	0.0000585 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				0.29	mg/kg		0.233	mg/kg	0.0000233 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				0.6	mg/kg		0.481	mg/kg	0.0000481 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				0.52	mg/kg		0.417	mg/kg	0.0000417 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.11	mg/kg		0.0882	mg/kg	0.00000882 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				0.52	mg/kg		0.417	mg/kg	0.0000417 %	✓	
			205-883-8	191-24-2									
										Total:	0.214 %		

Key

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

Classification of sample: WS21-06/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS21-06/12/2024-0.10m
Moisture content:
23.2%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0188%)

Determinands

Moisture content: 23.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10 mg/kg	1.32	10.717 mg/kg	0.00107 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.391 mg/kg	0.000139 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		398.4 mg/kg	1.462	472.633 mg/kg	0.0473 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		64 mg/kg	1.126	58.488 mg/kg	0.00585 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	183 mg/kg	1.56	231.693 mg/kg	0.0149 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.9 mg/kg	1.353	0.989 mg/kg	0.0000989 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16.2 mg/kg	2.976	39.136 mg/kg	0.00391 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.146 mg/kg	0.000415 %	✓	
9	zinc { zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2] }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		276 mg/kg	4.398	985.25 mg/kg	0.0985 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		232 mg/kg		188.312 mg/kg	0.0188 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	●	pH				6.51	pH		6.51	pH	6.51 pH		
				PH									
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18	●	acenaphthylene				0.14	mg/kg		0.114	mg/kg	0.0000114 %	✓	
			205-917-1	208-96-8									
19	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	●	phenanthrene				0.14	mg/kg		0.114	mg/kg	0.0000114 %	✓	
			201-581-5	85-01-8									
22	●	anthracene				0.1	mg/kg		0.0812	mg/kg	0.00000812 %	✓	
			204-371-1	120-12-7									
23	●	fluoranthene				0.36	mg/kg		0.292	mg/kg	0.0000292 %	✓	
			205-912-4	206-44-0									
24	●	pyrene				0.38	mg/kg		0.308	mg/kg	0.0000308 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.36	mg/kg		0.292	mg/kg	0.0000292 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.39	mg/kg		0.317	mg/kg	0.0000317 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.57	mg/kg		0.463	mg/kg	0.0000463 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.22	mg/kg		0.179	mg/kg	0.0000179 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.46	mg/kg		0.373	mg/kg	0.0000373 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	●	indeno[123-cd]pyrene				0.38	mg/kg		0.308	mg/kg	0.0000308 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.07	mg/kg		0.0568	mg/kg	0.00000568 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	●	benzo[ghi]perylene				0.34	mg/kg		0.276	mg/kg	0.0000276 %	✓	
			205-883-8	191-24-2									
										Total:	0.191 %		

Key

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

Appendix A: Classifier defined and non GB MCL determinands

- **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

- **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

- **pH** (CAS Number: PH)

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

- **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

no measured concentrations of hexavalent chromium

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc sulphate (hydrous) (mono-, hexa- and hepta hydrate); [1] zinc sulphate (anhydrous) [2]}

no measured concentrations of hexavalent chromium

sulfur {sulfur}

Worse case compound

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 2025)

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

Waste Classification Report

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

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

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

X210M-I9Y1A-6RKTD

Report is invalid if pages are removed.

Job name

EMT-24-21127-Batch-1-202412231214

Description/Comments

Project

TE1890

Site

Plot 2, Marchwiel, Wrexham

Classified by

Name:
Adrian Read
Date:
27 Jan 2025 08:15 GMT
Telephone:
01925 818388

Company:
Tier Environmental
Suite 414
Chadwick House
Warrington
WA3 6AE

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	03 Dec 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales **Post Code** LL13 0SQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Proposed redevelopment of land

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

Waste created during excavation of soils during development

Description of the waste

Made ground and/or natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS09-09/12/2024-0.10m		Potentially Hazardous	HP 3(i)	3
2	WS23-09/12/2024-0.10m		Potentially Hazardous	HP 3(i)	5
3	WS24-09/12/2024-0.10m		Potentially Hazardous	HP 3(i)	7
4	WS25-09/12/2024-0.10m		Potentially Hazardous	HP 3(i)	9
5	WS26-09/12/2024-0.10m		Potentially Hazardous	HP 3(i)	11
6	WS26-09/12/2024-1.50m		Non Hazardous		13

Related documents

#	Name	Description
1	EMT-24-21127-Batch-1-202412231214.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Adrian Read

Created date: 27 Jan 2025 08:15 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	14
Appendix B: Rationale for selection of metal species	15
Appendix C: Version	15

Classification of sample: WS09-09/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS09-09/12/2024-0.10m
Moisture content:
26.7%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0337%)

Determinands

Moisture content: 26.7% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13.2 mg/kg	1.32	13.756 mg/kg	0.00138 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.3 mg/kg	1.142	2.074 mg/kg	0.000207 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				328.2 mg/kg	2.27	588.014 mg/kg	0.0588 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		90 mg/kg	1.126	79.976 mg/kg	0.008 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	271 mg/kg	1.56	333.631 mg/kg	0.0214 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		2.1 mg/kg	1.353	2.243 mg/kg	0.000224 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17.8 mg/kg	2.976	41.813 mg/kg	0.00418 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.031 mg/kg	0.000403 %	✓	
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		402 mg/kg	2.774	880.195 mg/kg	0.088 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		427 mg/kg		337.017 mg/kg	0.0337 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<LOD**
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	•	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	•	pH				6.58	pH		6.58	pH	6.58 pH		
				PH									
17		naphthalene				0.16	mg/kg		0.126	mg/kg	0.0000126 %	✓	
		601-052-00-2	202-049-5	91-20-3									
18	•	acenaphthylene				0.3	mg/kg		0.237	mg/kg	0.0000237 %	✓	
			205-917-1	208-96-8									
19	•	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	•	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	•	phenanthrene				0.42	mg/kg		0.331	mg/kg	0.0000331 %	✓	
			201-581-5	85-01-8									
22	•	anthracene				0.19	mg/kg		0.15	mg/kg	0.000015 %	✓	
			204-371-1	120-12-7									
23	•	fluoranthene				1.09	mg/kg		0.86	mg/kg	0.000086 %	✓	
			205-912-4	206-44-0									
24	•	pyrene				1	mg/kg		0.789	mg/kg	0.0000789 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.76	mg/kg		0.6	mg/kg	0.00006 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.9	mg/kg		0.71	mg/kg	0.000071 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				1.37	mg/kg		1.081	mg/kg	0.000108 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.53	mg/kg		0.418	mg/kg	0.0000418 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				1.1	mg/kg		0.868	mg/kg	0.0000868 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	•	indeno[123-cd]pyrene				1.09	mg/kg		0.86	mg/kg	0.000086 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.18	mg/kg		0.142	mg/kg	0.0000142 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	•	benzo[ghi]perylene				1.09	mg/kg		0.86	mg/kg	0.000086 %	✓	
			205-883-8	191-24-2									
										Total:	0.217 %		

Key

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

Classification of sample: WS23-09/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS23-09/12/2024-0.10m
Moisture content:
23.4%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0359%)

Determinands

Moisture content: 23.4% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13.6 mg/kg	1.32	14.551 mg/kg	0.00146 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2 mg/kg	1.142	1.851 mg/kg	0.000185 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				175.3 mg/kg	2.27	322.472 mg/kg	0.0322 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		70 mg/kg	1.126	63.867 mg/kg	0.00639 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	232 mg/kg	1.56	293.255 mg/kg	0.0188 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.4 mg/kg	1.353	1.536 mg/kg	0.000154 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.4 mg/kg	2.976	37.143 mg/kg	0.00371 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.139 mg/kg	0.000414 %	✓	
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		303 mg/kg	2.774	681.172 mg/kg	0.0681 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		443 mg/kg		358.995 mg/kg	0.0359 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	●	pH				6.79	pH		6.79	pH	6.79 pH		
				PH									
17		naphthalene				0.1	mg/kg		0.081	mg/kg	0.0000081 %	✓	
		601-052-00-2	202-049-5	91-20-3									
18	●	acenaphthylene				0.16	mg/kg		0.13	mg/kg	0.000013 %	✓	
			205-917-1	208-96-8									
19	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	●	phenanthrene				0.25	mg/kg		0.203	mg/kg	0.0000203 %	✓	
			201-581-5	85-01-8									
22	●	anthracene				0.11	mg/kg		0.0891	mg/kg	0.00000891 %	✓	
			204-371-1	120-12-7									
23	●	fluoranthene				0.85	mg/kg		0.689	mg/kg	0.0000689 %	✓	
			205-912-4	206-44-0									
24	●	pyrene				0.78	mg/kg		0.632	mg/kg	0.0000632 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.67	mg/kg		0.543	mg/kg	0.0000543 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.81	mg/kg		0.656	mg/kg	0.0000656 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				1.18	mg/kg		0.956	mg/kg	0.0000956 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.46	mg/kg		0.373	mg/kg	0.0000373 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.91	mg/kg		0.737	mg/kg	0.0000737 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	●	indeno[123-cd]pyrene				0.86	mg/kg		0.697	mg/kg	0.0000697 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.15	mg/kg		0.122	mg/kg	0.0000122 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	●	benzo[ghi]perylene				0.83	mg/kg		0.673	mg/kg	0.0000673 %	✓	
			205-883-8	191-24-2									
										Total:	0.168 %		

Key

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

Classification of sample: WS24-09/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS24-09/12/2024-0.10m
Moisture content:
25.9%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0216%)

Determinands

Moisture content: 25.9% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.8 mg/kg	1.32	12.375 mg/kg	0.00124 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2.1 mg/kg	1.142	1.905 mg/kg	0.000191 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				378.1 mg/kg	2.27	681.721 mg/kg	0.0682 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		85 mg/kg	1.126	76.013 mg/kg	0.0076 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	209 mg/kg	1.56	258.937 mg/kg	0.0166 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.2 mg/kg	1.353	1.29 mg/kg	0.000129 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16.8 mg/kg	2.976	39.715 mg/kg	0.00397 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.057 mg/kg	0.000406 %	✓	
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		321 mg/kg	2.774	707.308 mg/kg	0.0707 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		272 mg/kg		216.044 mg/kg	0.0216 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	●	pH				6.66	pH		6.66	pH	6.66 pH		
				PH									
17		naphthalene				0.06	mg/kg		0.0477	mg/kg	0.00000477 %	✓	
		601-052-00-2	202-049-5	91-20-3									
18	●	acenaphthylene				0.11	mg/kg		0.0874	mg/kg	0.00000874 %	✓	
			205-917-1	208-96-8									
19	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	●	phenanthrene				0.2	mg/kg		0.159	mg/kg	0.0000159 %	✓	
			201-581-5	85-01-8									
22	●	anthracene				0.08	mg/kg		0.0635	mg/kg	0.00000635 %	✓	
			204-371-1	120-12-7									
23	●	fluoranthene				0.44	mg/kg		0.349	mg/kg	0.0000349 %	✓	
			205-912-4	206-44-0									
24	●	pyrene				0.39	mg/kg		0.31	mg/kg	0.000031 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.33	mg/kg		0.262	mg/kg	0.0000262 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.4	mg/kg		0.318	mg/kg	0.0000318 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.53	mg/kg		0.421	mg/kg	0.0000421 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.21	mg/kg		0.167	mg/kg	0.0000167 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.39	mg/kg		0.31	mg/kg	0.000031 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	●	indeno[123-cd]pyrene				0.43	mg/kg		0.342	mg/kg	0.0000342 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.08	mg/kg		0.0635	mg/kg	0.00000635 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	●	benzo[ghi]perylene				0.44	mg/kg		0.349	mg/kg	0.0000349 %	✓	
			205-883-8	191-24-2									
33		asbestos				<0.001	%		<0.001	%	<0.001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.192 %		

Key

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

Classification of sample: WS25-09/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS25-09/12/2024-0.10m
Moisture content:
24.8%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0151%)

Determinands

Moisture content: 24.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13.7 mg/kg	1.32	14.494 mg/kg	0.00145 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.373 mg/kg	0.000137 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				173.8 mg/kg	2.27	316.127 mg/kg	0.0316 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		50 mg/kg	1.126	45.108 mg/kg	0.00451 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	176 mg/kg	1.56	219.974 mg/kg	0.0141 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.7 mg/kg	1.353	0.759 mg/kg	0.0000759 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14.8 mg/kg	2.976	35.295 mg/kg	0.00353 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		2 mg/kg	2.554	4.093 mg/kg	0.000409 %	✓	
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		222 mg/kg	2.774	493.478 mg/kg	0.0493 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		188 mg/kg		150.641 mg/kg	0.0151 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	•	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	•	pH				7.33	pH		7.33	pH	7.33 pH		
				PH									
17		naphthalene				0.06	mg/kg		0.0481	mg/kg	0.00000481 %	✓	
		601-052-00-2	202-049-5	91-20-3									
18	•	acenaphthylene				0.05	mg/kg		0.0401	mg/kg	0.00000401 %	✓	
			205-917-1	208-96-8									
19	•	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	•	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	•	phenanthrene				0.12	mg/kg		0.0962	mg/kg	0.00000962 %	✓	
			201-581-5	85-01-8									
22	•	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23	•	fluoranthene				0.29	mg/kg		0.232	mg/kg	0.0000232 %	✓	
			205-912-4	206-44-0									
24	•	pyrene				0.26	mg/kg		0.208	mg/kg	0.0000208 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.22	mg/kg		0.176	mg/kg	0.0000176 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.31	mg/kg		0.248	mg/kg	0.0000248 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.39	mg/kg		0.313	mg/kg	0.0000313 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.15	mg/kg		0.12	mg/kg	0.000012 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.21	mg/kg		0.168	mg/kg	0.0000168 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	•	indeno[123-cd]pyrene				0.27	mg/kg		0.216	mg/kg	0.0000216 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.06	mg/kg		0.0481	mg/kg	0.00000481 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	•	benzo[ghi]perylene				0.32	mg/kg		0.256	mg/kg	0.0000256 %	✓	
			205-883-8	191-24-2									
										Total:	0.12 %		

Key

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

Classification of sample: WS26-09/12/2024-0.10m

Potentially Hazardous Waste
Classified as **17 05 04** or **17 05 03 ***
in the List of Waste

Sample details

Sample name:
WS26-09/12/2024-0.10m
Moisture content:
19.8%
(dry weight correction)

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

Hazard properties (substances considered hazardous until shown otherwise)

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"

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group (conc.: 0.0131%)

Determinands

Moisture content: 19.8% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.8 mg/kg	1.32	13.005 mg/kg	0.0013 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5 mg/kg	1.142	1.43 mg/kg	0.000143 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				186.2 mg/kg	2.27	352.816 mg/kg	0.0353 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		56 mg/kg	1.126	52.629 mg/kg	0.00526 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	177 mg/kg	1.56	230.457 mg/kg	0.0148 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.9 mg/kg	1.353	1.017 mg/kg	0.000102 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17.9 mg/kg	2.976	44.47 mg/kg	0.00445 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1 mg/kg	2.554	2.132 mg/kg	0.000213 %	✓	
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		253 mg/kg	2.774	585.859 mg/kg	0.0586 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		157 mg/kg		131.052 mg/kg	0.0131 %	✓	
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<LOD**
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		**<LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
13		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-021-00-3	203-625-9	108-88-3									
14	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
		601-023-00-4	202-849-4	100-41-4									
15		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<**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]									
16	●	pH				6.8	pH		6.8	pH	6.8 pH		
				PH									
17		naphthalene				0.07	mg/kg		0.0584	mg/kg	0.00000584 %	✓	
		601-052-00-2	202-049-5	91-20-3									
18	●	acenaphthylene				0.07	mg/kg		0.0584	mg/kg	0.00000584 %	✓	
			205-917-1	208-96-8									
19	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	●	phenanthrene				0.14	mg/kg		0.117	mg/kg	0.0000117 %	✓	
			201-581-5	85-01-8									
22	●	anthracene				0.05	mg/kg		0.0417	mg/kg	0.00000417 %	✓	
			204-371-1	120-12-7									
23	●	fluoranthene				0.29	mg/kg		0.242	mg/kg	0.0000242 %	✓	
			205-912-4	206-44-0									
24	●	pyrene				0.28	mg/kg		0.234	mg/kg	0.0000234 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.2	mg/kg		0.167	mg/kg	0.0000167 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.29	mg/kg		0.242	mg/kg	0.0000242 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.36	mg/kg		0.301	mg/kg	0.0000301 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.14	mg/kg		0.117	mg/kg	0.0000117 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.2	mg/kg		0.167	mg/kg	0.0000167 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30	●	indeno[123-cd]pyrene				0.28	mg/kg		0.234	mg/kg	0.0000234 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				0.05	mg/kg		0.0417	mg/kg	0.00000417 %	✓	
		601-041-00-2	200-181-8	53-70-3									
32	●	benzo[ghi]perylene				0.29	mg/kg		0.242	mg/kg	0.0000242 %	✓	
			205-883-8	191-24-2									
										Total:	0.133 %		

Key

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

Classification of sample: WS26-09/12/2024-1.50m

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

Sample details

Sample name:
WS26-09/12/2024-1.50m
Moisture content:
21.2%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 21.2% Dry 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				8.1 pH		8.1 pH	8.1 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0165 %	0.0165 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0165 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Appendix A: Classifier defined and non GB MCL determinands

- **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

- **pH** (CAS Number: PH)

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

- **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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

sulfur {sulfur}

Worse case compound.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 2025)

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

Waste Classification Report

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

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

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

SB8JU-AANOZ-U5GL4

Report is invalid if pages are removed.

Job name

EMT-24-21537-Batch-1-202501071515

Description/Comments

Project

TE1890

Site

Plot 2, Marchwiel, Wrexham

Classified by

Name:
Adrian Read
Date:
27 Jan 2025 08:19 GMT
Telephone:
01925 818388

Company:
Tier Environmental
Suite 414
Chadwick House
Warrington
WA3 6AE

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	03 Dec 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales **Post Code** LL13 0SQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Proposed redevelopment of land

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

Waste created during excavation of soils during development

Description of the waste

Made ground and/or natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	CP03-11/12/2024-1.00m		Non Hazardous		3
2	CP04-11/12/2024-0.80m		Non Hazardous		5
3	CP09-13/12/2024-0.90m		Non Hazardous		7
4	CP13-13/12/2024-1.00m		Non Hazardous		9
5	CP15-13/12/2024-0.80m		Non Hazardous		11

Related documents

#	Name	Description
1	EMT-24-21537-Batch-1-202501071515.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Adrian Read

Created date: 27 Jan 2025 08:19 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	13
Appendix B: Rationale for selection of metal species	14
Appendix C: Version	14

Classification of sample: CP03-11/12/2024-1.00m

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

Sample details

Sample name:
CP03-11/12/2024-1.00m
Moisture content:
26.2%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 26.2% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10.4 mg/kg	1.32	10.881 mg/kg	0.00109 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.1 mg/kg	1.142	<0.114 mg/kg	<0.0000114 %		<**LOD**
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				41.5 mg/kg	2.27	74.647 mg/kg	0.00746 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26 mg/kg	1.126	23.196 mg/kg	0.00232 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	40 mg/kg	1.56	49.439 mg/kg	0.00317 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<**LOD**
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39.2 mg/kg	2.976	92.448 mg/kg	0.00924 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		90 mg/kg	2.774	197.839 mg/kg	0.0198 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<**LOD**
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
13	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
14	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<**LOD**
15	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**

#		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	●	pH				8.46	pH		8.46	pH	8.46 pH		
				PH									
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18	●	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
19	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
22	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-912-4	206-44-0									
24	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			204-927-3	129-00-0									
25		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
30	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
32	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			205-883-8	191-24-2									
33		sulfur { sulfur }				0.02	%		0.0158	%	0.0158 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0645 %		

Key

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

Classification of sample: CP04-11/12/2024-0.80m

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

Sample details

Sample name:
CP04-11/12/2024-0.80m
Moisture content:
17.8%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 17.8% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.2	mg/kg	1.32	9.191	mg/kg	0.000919 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.388	mg/kg	0.0000388 %	✓	
3		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				79.3	mg/kg	2.27	152.811	mg/kg	0.0153 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	17.204	mg/kg	0.00172 %	✓	
5		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	48	mg/kg	1.56	63.558	mg/kg	0.00407 %	✓	
6		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
7		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18.3	mg/kg	2.976	46.236	mg/kg	0.00462 %	✓	
8		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		1	mg/kg	2.554	2.168	mg/kg	0.000217 %	✓	
9		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		119	mg/kg	2.774	280.241	mg/kg	0.028 %	✓	
10		TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<**LOD**
11		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
12		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
13		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
14		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
15		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**

#		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		pH				7.41	pH		7.41	pH	7.41 pH		
				PH									
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
19		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21		phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			201-581-5	85-01-8									
22		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23		fluoranthene				0.06	mg/kg		0.0509	mg/kg	0.00000509 %	✓	
			205-912-4	206-44-0									
24		pyrene				0.06	mg/kg		0.0509	mg/kg	0.00000509 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.07	mg/kg		0.0594	mg/kg	0.00000594 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.09	mg/kg		0.0764	mg/kg	0.00000764 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.03	mg/kg		0.0255	mg/kg	0.00000255 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.06	mg/kg		0.0509	mg/kg	0.00000509 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30		indeno[123-cd]pyrene				0.07	mg/kg		0.0594	mg/kg	0.00000594 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
32		benzo[ghi]perylene				0.06	mg/kg		0.0509	mg/kg	0.00000509 %	✓	
			205-883-8	191-24-2									
33		sulfur { sulfur }				0.03	%		0.0255	%	0.0255 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0857 %		

Key

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

Classification of sample: CP09-13/12/2024-0.90m

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

Sample details

Sample name:
CP09-13/12/2024-0.90m
Moisture content:
14%
(dry weight correction)

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

Hazard properties

None identified

Determinands

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

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4	mg/kg	1.32	10.887	mg/kg	0.00109 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.301	mg/kg	0.0000301 %	✓	
3		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				74	mg/kg	2.27	147.351	mg/kg	0.0147 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	15.802	mg/kg	0.00158 %	✓	
5		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	49	mg/kg	1.56	67.045	mg/kg	0.0043 %	✓	
6		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
7		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17.2	mg/kg	2.976	44.905	mg/kg	0.00449 %	✓	
8		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		77	mg/kg	2.774	187.377	mg/kg	0.0187 %	✓	
10		TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
11		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
12		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
13		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
14		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
15		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

#		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		pH		PH		6.88	pH		6.88	pH	6.88 pH		
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
19		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21		phenanthrene				0.05	mg/kg		0.0439	mg/kg	0.00000439 %	✓	
			201-581-5	85-01-8									
22		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23		fluoranthene				0.11	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
			205-912-4	206-44-0									
24		pyrene				0.1	mg/kg		0.0877	mg/kg	0.00000877 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.1	mg/kg		0.0877	mg/kg	0.00000877 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.11	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.16	mg/kg		0.14	mg/kg	0.000014 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.06	mg/kg		0.0526	mg/kg	0.00000526 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.11	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30		indeno[123-cd]pyrene				0.11	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
32		benzo[ghi]perylene				0.11	mg/kg		0.0965	mg/kg	0.00000965 %	✓	
			205-883-8	191-24-2									
33		sulfur { sulfur }				0.02	%		0.0175	%	0.0175 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0681 %		

Key

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

Classification of sample: CP13-13/12/2024-1.00m

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

Sample details

Sample name:
CP13-13/12/2024-1.00m
Moisture content:
27.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 27.5% Dry Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	13.462 mg/kg	0.00135 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6 mg/kg	1.142	0.538 mg/kg	0.0000538 %	✓	
3	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				122.9 mg/kg	2.27	218.81 mg/kg	0.0219 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		39 mg/kg	1.126	34.439 mg/kg	0.00344 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	95 mg/kg	1.56	116.222 mg/kg	0.00745 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.2 mg/kg	1.353	0.212 mg/kg	0.0000212 %	✓	
7	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		40.8 mg/kg	2.976	95.24 mg/kg	0.00952 %	✓	
8	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		175 mg/kg	2.774	380.765 mg/kg	0.0381 %	✓	
10	TPH (C6 to C40) petroleum group			TPH		<52 mg/kg		<52 mg/kg	<0.0052 %		<LOD
11	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
12	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
13	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
14	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	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

#		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		pH		PH		7.43	pH		7.43	pH	7.43 pH		
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
19		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21		phenanthrene				0.06	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
			201-581-5	85-01-8									
22		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23		fluoranthene				0.15	mg/kg		0.118	mg/kg	0.0000118 %	✓	
			205-912-4	206-44-0									
24		pyrene				0.14	mg/kg		0.11	mg/kg	0.000011 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.11	mg/kg		0.0863	mg/kg	0.00000863 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.11	mg/kg		0.0863	mg/kg	0.00000863 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.14	mg/kg		0.11	mg/kg	0.000011 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.06	mg/kg		0.0471	mg/kg	0.00000471 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.1	mg/kg		0.0784	mg/kg	0.00000784 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30		indeno[123-cd]pyrene				0.1	mg/kg		0.0784	mg/kg	0.00000784 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
32		benzo[ghi]perylene				0.1	mg/kg		0.0784	mg/kg	0.00000784 %	✓	
			205-883-8	191-24-2									
33		sulfur { sulfur }				0.03	%		0.0235	%	0.0235 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.111 %		

Key

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

Classification of sample: CP15-13/12/2024-0.80m

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

Sample details

Sample name:
CP15-13/12/2024-0.80m
Moisture content:
14.3%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 14.3% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		3.1	mg/kg	1.32	3.581	mg/kg	0.000358 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2	mg/kg	1.142	0.2	mg/kg	0.00002 %	✓	
3		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				50.1	mg/kg	2.27	99.499	mg/kg	0.00995 %	✓	
4		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		10	mg/kg	1.126	9.85	mg/kg	0.000985 %	✓	
5		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	42	mg/kg	1.56	57.316	mg/kg	0.00367 %	✓	
6		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<**LOD**
7		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		8.3	mg/kg	2.976	21.612	mg/kg	0.00216 %	✓	
8		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
9		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		52	mg/kg	2.774	126.208	mg/kg	0.0126 %	✓	
10		TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<**LOD**
11		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
12		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
13		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
14		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<**LOD**
15		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**

#		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		pH				8.15	pH		8.15	pH	8.15 pH		
				PH									
17		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
18		acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<**LOD**
			205-917-1	208-96-8									
19		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
20		fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			201-695-5	86-73-7									
21		phenanthrene				0.05	mg/kg		0.0437	mg/kg	0.00000437 %	✓	
			201-581-5	85-01-8									
22		anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
			204-371-1	120-12-7									
23		fluoranthene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
			205-912-4	206-44-0									
24		pyrene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
			204-927-3	129-00-0									
25		benzo[a]anthracene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
		601-033-00-9	200-280-6	56-55-3									
26		chrysene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
		601-048-00-0	205-923-4	218-01-9									
27		benzo[b]fluoranthene				0.13	mg/kg		0.114	mg/kg	0.0000114 %	✓	
		601-034-00-4	205-911-9	205-99-2									
28		benzo[k]fluoranthene				0.05	mg/kg		0.0437	mg/kg	0.00000437 %	✓	
		601-036-00-5	205-916-6	207-08-9									
29		benzo[a]pyrene; benzo[def]chrysene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
		601-032-00-3	200-028-5	50-32-8									
30		indeno[123-cd]pyrene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
			205-893-2	193-39-5									
31		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
32		benzo[ghi]perylene				0.09	mg/kg		0.0787	mg/kg	0.00000787 %	✓	
			205-883-8	191-24-2									
33		sulfur { sulfur }				0.03	%		0.0262	%	0.0262 %	✓	
		016-094-00-1	231-722-6	7704-34-9									
										Total:	0.0616 %		

Key

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

Appendix A: Classifier defined and non GB MCL determinands

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

pH (CAS Number: PH)

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

sulfur {sulfur}

Worse case compound

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 2025)

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

Waste Classification Report

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

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

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

2Q039-4MAPZ-1EHFP

Report is invalid if pages are removed.

Job name

EMT-24-21741-Batch-1-202501091519

Description/Comments

Project

TE1890

Site

Plot 2, Marchwiel, Wrexham

Classified by

Name:
Adrian Read
Date:
27 Jan 2025 08:21 GMT
Telephone:
01925 818388

Company:
Tier Environmental
Suite 414
Chadwick House
Warrington
WA3 6AE

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

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	03 Dec 2020
Most recent 3 year Refresher	05 Dec 2023

Next 3 year Refresher due by Dec 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Sesswick Way, Marchwiel, Cross Lanes, Wrexham, Wales **Post Code** LL13 0SQ

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Proposed redevelopment of land

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

Waste created during excavation of soils during development

Description of the waste

Made ground and/or natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	CP01-1.00m		Non Hazardous		3
2	CP02-1.00m		Non Hazardous		4
3	CP06-1.00m		Non Hazardous		5
4	CP06-2.00-2.45m		Non Hazardous		6
5	CP07-0.50m		Non Hazardous		7
6	CP08-1.00m		Non Hazardous		8
7	CP08-2.50m		Non Hazardous		9
8	CP10-0.70m		Non Hazardous		10
9	CP11-1.00m		Non Hazardous		11
10	CP12-0.70m		Non Hazardous		12
11	CP14-1.20-1.65m		Non Hazardous		13
12	CP16-0.50m		Non Hazardous		14
13	CP17-0.70m		Non Hazardous		15
14	CP18-0.60m		Non Hazardous		16

Related documents

#	Name	Description
1	EMT-24-21741-Batch-1-202501091519.HWOL	Element .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: Adrian Read

Created date: 27 Jan 2025 08:21 GMT

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

Classification of sample: CP01-1.00m

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

Sample details

Sample name:
CP01-1.00m
Moisture content:
12.6%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 12.6% Dry 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				6.97 pH		6.97 pH	6.97 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0178 %	0.0178 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0178 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP02-1.00m

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

Sample details

Sample name:
CP02-1.00m
Moisture content:
17.2%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 17.2% Dry 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				7.47 pH		7.47 pH	7.47 pH		
				PH							
2		sulfur { sulfur }				0.01 %		0.0085 %	0.00853 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.00853 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP06-1.00m

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

Sample details

Sample name:
CP06-1.00m
Moisture content:
18.9%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.9% Dry 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				7.36 pH		7.36 pH	7.36 pH		
				PH							
2		sulfur { sulfur }				0.03 %		0.0252 %	0.0252 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0252 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP06-2.00-2.45m

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

Sample details

Sample name:
CP06-2.00-2.45m
Moisture content:
19.1%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 19.1% Dry 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				7.99 pH		7.99 pH	7.99 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0168 %	0.0168 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0168 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP07-0.50m

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

Sample details

Sample name:
CP07-0.50m
Moisture content:
15.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 15.5% Dry 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				6.87 pH		6.87 pH	6.87 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0173 %	0.0173 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0173 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP08-1.00m

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

Sample details

Sample name:
CP08-1.00m
Moisture content:
22.2%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 22.2% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		pH			PH		7.91 pH		7.91 pH	7.91 pH		
2		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		0.04 %		0.0327 %	0.0327 %	✓	
									Total:	0.0327 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP08-2.50m

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

Sample details

Sample name:
CP08-2.50m
Moisture content:
18.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.5% Dry 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				8.49 pH		8.49 pH	8.49 pH		
				PH							
2		sulfur { sulfur }				0.17 %		0.143 %	0.143 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.143 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP10-0.70m

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

Sample details

Sample name:
CP10-0.70m
Moisture content:
18%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18% Dry 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				8.46 pH		8.46 pH	8.46 pH		
				PH							
2		sulfur { sulfur }				0.03 %		0.0254 %	0.0254 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0254 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP11-1.00m

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

Sample details

Sample name:
CP11-1.00m
Moisture content:
17%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 17% Dry 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				8.08 pH		8.08 pH	8.08 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0171 %	0.0171 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0171 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP12-0.70m

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

Sample details

Sample name:
CP12-0.70m
Moisture content:
21.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 21.4% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		pH			PH		7.23 pH		7.23 pH	7.23 pH		
2		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		0.06 %		0.0494 %	0.0494 %	✓	
									Total:	0.0494 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP14-1.20-1.65m

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

Sample details

Sample name:
CP14-1.20-1.65m
Moisture content:
18.3%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18.3% Dry 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				7.74 pH		7.74 pH	7.74 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0169 %	0.0169 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0169 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP16-0.50m

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

Sample details

Sample name:
CP16-0.50m
Moisture content:
15.5%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 15.5% Dry Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1		pH			PH		8.26 pH		8.26 pH	8.26 pH		
2		sulfur { sulfur }	016-094-00-1	231-722-6	7704-34-9		0.02 %		0.0173 %	0.0173 %	✓	
									Total:	0.0173 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP17-0.70m

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

Sample details

Sample name:
CP17-0.70m
Moisture content:
15.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 15.4% Dry 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				7.82 pH		7.82 pH	7.82 pH		
				PH							
2		sulfur { sulfur }				0.02 %		0.0173 %	0.0173 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.0173 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

Classification of sample: CP18-0.60m

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

Sample details

Sample name:
CP18-0.60m
Moisture content:
15.4%
(dry weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 15.4% Dry 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				7.51 pH		7.51 pH	7.51 pH		
				PH							
2		sulfur { sulfur }				0.01 %		0.0086 %	0.00867 %	✓	
		016-094-00-1	231-722-6	7704-34-9							
								Total:	0.00867 %		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration

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.

Appendix B: Rationale for selection of metal species

sulfur {sulfur}

Worse case compound

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.24.6453.11761 (25 Jan 2025)
HazWasteOnline Database: 2025.24.6453.11761 (25 Jan 2025)

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4th ATP - Regulation 487/2013/EU of 8 May 2013
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9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
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GB MCL List v3.0 - version 3.0 of 11th January 2024
GB MCL List v4.0 - version 4.0 of 2nd March 2024
GB MCL List v5.0 - version 5.0 of 26th June 2024

APPENDIX D - GEOENVIRONMENTAL GROUNDWATER LABORATORY RESULTS

Element Materials Technology
Unit 3 Deeside Point
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Attention :	Sean Lee
Date :	17th January, 2025
Your reference :	TE1890
Our reference :	Test Report 25/260 Batch 1
Location :	Plot 2, Marchwiel, Wrexham
Date samples received :	11th January, 2025
Status :	Final Report
Issue :	202501171250

Eight samples were received for analysis on 11th January, 2025 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 16.218 kg of CO2

Scope 1&2&3 emissions - 38.326 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Sean Lee
EMT Job No: 25/260

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-6	7-12	13-18	19-23	24-29	30-35	36-41	42-47			LOD/LOR	Units	Method No.
Sample ID	CP03	CP05	CP06	CP09	CP11	CP14	CP15	CP16					
Depth	6.50	7.00	2.00	3.00	6.00	3.00	5.00	4.00					
COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN BOD G					
Sample Date	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025					
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025					
Dissolved Arsenic	<0.9	<0.9	1.0	<0.9	<0.9	1.9	<0.9	<0.9			<0.9	ug/l	TM170/PM14
Dissolved Cadmium	<0.03	0.05	0.03	0.03	<0.03	<0.03	0.10	<0.03			<0.03	ug/l	TM170/PM14
Total Dissolved Chromium	0.3	<0.2	0.5	0.7	0.5	<0.2	0.5	<0.2			<0.2	ug/l	TM170/PM14
Dissolved Copper	<1	2	1	2	<1	<1	4	<1			<1	ug/l	TM170/PM14
Dissolved Lead	<0.4	0.4	1.0	<0.4	<0.4	<0.4	<0.4	<0.4			<0.4	ug/l	TM170/PM14
Dissolved Mercury	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	ug/l	TM170/PM14
Dissolved Nickel	0.5	1.8	0.5	0.8	0.6	1.3	2.8	1.0			<0.2	ug/l	TM170/PM14
Dissolved Selenium	5.3	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2			<1.2	ug/l	TM170/PM14
Dissolved Zinc	3.0	57.2	1.7	3.9	7.1	3.6	9.7	3.8			<1.5	ug/l	TM170/PM14
Total Hardness Dissolved (as CaCO3)	484	329	239	406	430	371	344	476			<1	mg/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Acenaphthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Fluorene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Phenanthrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Pyrene	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	0.021	<0.005			<0.005	ug/l	TM4/PM30
Benzo(a)anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008			<0.008	ug/l	TM4/PM30
Benzo(a)pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005			<0.005	ug/l	TM4/PM30
PAH 16 Total	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173	<0.173			<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008			<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008			<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	87	87	88	81	89	71	89	81			<0	%	TM4/PM30
MTBE	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12
Benzene	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12
Toluene	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12
m/p-Xylene	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12
o-Xylene	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM36/PM12

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Sean Lee
EMT Job No: 25/260

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

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COC No / misc													
Containers	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN P G	V H HN BOD G					
Sample Date	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025	09/01/2025					
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025	11/01/2025					
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C6-C8 (HS_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C8-C10 (HS_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>C10-C12 (EH_CU_1D_AL)	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM5/PM16/PM30
>C12-C16 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>C16-C21 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>C21-C35 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>C35-C40 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 (HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC7-EC8 (HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC8-EC10 (HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/l	TM5/PM16/PM30
>EC12-EC16 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>EC16-EC21 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>EC21-EC35 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
>EC35-EC40 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/PM16/PM30
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<10	<10	<10	<10	<10	<10	<10	<10			<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15			<0.15	mg/l	TM26/PM0
Sulphate as SO4	74.2	56.6	62.5	66.2	97.1	57.1	96.7	119.5			<0.5	mg/l	TM38/PM0
Total Ammonia as N	0.09	0.05	0.12	0.11	0.10	0.21	0.05	0.09			<0.03	mg/l	TM38/PM0
Electrical Conductivity @25C	1061	716	989	958	928	854	912	961			<2	uS/cm	TM76/PM0
pH	7.72	7.63	7.77	7.63	7.65	7.54	7.40	7.57			<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Tier Environmental
Reference: TE1890
Location: Plot 2, Marchwiel, Wrexham
Contact: Sean Lee

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 25/260						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

Please include all sections of this report if it is reproduced

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 25/260

SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 35°C ±5°C.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil is quoted, this refers to Total Aliphatics C10-C40.

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.
Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

Tentatively Identified Compounds (TICs)

Where Tentatively Identified Compounds (TICs) are reported, up to 10 Tentatively Identified Compounds will be listed where there is found to be a greater than 80% match with the NIST library. The reported concentration is determined semi-quantitively, with a matrix specific limit of detection. Note, other compounds may be present but are not reported.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 25/260

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma-Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) - All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.				
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM76	Modified US EPA method 120.1 (1982). Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma-Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				

APPENDIX E - GEOTECHNICAL IN SITU FIELDWORK AND LABORATORY RESULTS

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 24/12468
Issue Number: 1 **Date:** 07 January, 2025

Client:
Murray Rix (Northern) Ltd
Andrew House
Hadfield Street
Dukinfield
Dukinfield
SK16 4QX

Project Manager: Enquires/Owain Davies
Project Name: Plot 2, Marchwiel, Wrexham
Project Ref: N/A
Order No: 24/427
Date Samples Received: 20/12/24
Date Instructions Received: 23/12/24
Date Analysis Completed: 07/01/25

Approved by:



Gemma Berrisford
Deputy Client Services Supervisor

Envirolab Job Number: 24/12468

Client Project Name: Plot 2, Marchwiel, Wrexham

Client Project Ref: N/A

Lab Sample ID	24/12468/1	24/12468/2	24/12468/3	24/12468/4	24/12468/5	24/12468/6	24/12468/7	Units	Limit of Detection	Method ref
Client Sample No	613615	613620	613623	616804	616805	616809	616810			
Client Sample ID	CP02	CP11	CP10	CP4	CP5	CP6	CP7			
Depth to Top	5.00	4.00	8.00	6.00	0.60	6.00	6.50			
Depth To Bottom	5.45	4.45	8.45	6.45		6.45	6.95			
Date Sampled	03-Dec-24	03-Dec-24	03-Dec-24							
Sample Type	SOIL - B	SOIL - B	SOIL - B	SOIL - B	SOIL - B	SOIL - B	SOIL - B			
Sample Matrix Code	6A	6A	6	6	6	6AE	6A			
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	% w/w	0.1	A-T-044
pH BRE$_D^{M\#}$	8.33	8.34	8.53	8.59	7.21	8.33	8.50	pH	0.01	A-T-031s
Ammonium NH4 BRE (water sol 2:1)$_D$	1.48	<1.00	1.39	1.43	<1.00	1.68	1.88	mg/l	1	A-T-033s
Chloride BRE, SO4 equiv. (water sol 2:1)$_D^{M\#}$	<35	11	<7	<7	<7	14	18	mg/l	7	A-T-026s
Nitrate BRE, SO4 equiv. (water sol 2:1)$_D$	<2.0	<0.4	0.9	0.6	13.2	0.4	0.5	mg/l	0.4	A-T-026s
Sulphate BRE (water sol 2:1)$_D^{M\#}$	86	72	38	40	21	73	64	mg/l	10	A-T-026s
Sulphate BRE (acid sol)$_D^{M\#}$	0.06	0.06	0.04	0.05	0.04	0.07	0.06	% w/w	0.02	A-T-028s
Sulphur BRE (total)$_D$	0.17	0.10	0.08	0.11	0.03	0.13	0.11	% w/w	0.01	A-T-024s
Magnesium BRE (water sol 2:1)$_D$	14	7	7	3	3	4	5	mg/l	1	A-T-SOLMETS

Envirolab Job Number: 24/12468

Client Project Name: Plot 2, Marchwiel, Wrexham

Client Project Ref: N/A

Lab Sample ID	24/12468/8	24/12468/9	24/12468/10	24/12468/11				Units	Limit of Detection	Method ref
Client Sample No	616813	616815	616817	616819						
Client Sample ID	CP8	CP9	CP12	CP13						
Depth to Top	5.00	6.70	4.40	5.00						
Depth To Bottom	5.45	7.15	4.85	5.45						
Date Sampled										
Sample Type	SOIL - B	SOIL - B	SOIL - B	SOIL - B						
Sample Matrix Code	6A	6	6	6						
% Stones >10mm$_A$	<0.1	<0.1	<0.1	<0.1				% w/w	0.1	A-T-044
pH BRE$_D$$^{M\#}$	8.38	8.51	8.56	8.42				pH	0.01	A-T-031s
Ammonium NH4 BRE (water sol 2:1)$_D$	1.87	1.41	1.73	1.28				mg/l	1	A-T-033s
Chloride BRE, SO4 equiv. (water sol 2:1)$_D$$^{M\#}$	13	<7	8	15				mg/l	7	A-T-026s
Nitrate BRE, SO4 equiv. (water sol 2:1)$_D$	0.5	<0.4	<0.4	<0.4				mg/l	0.4	A-T-026s
Sulphate BRE (water sol 2:1)$_D$$^{M\#}$	55	44	47	60				mg/l	10	A-T-026s
Sulphate BRE (acid sol)$_D$$^{M\#}$	0.06	0.05	0.06	0.04				% w/w	0.02	A-T-028s
Sulphur BRE (total)$_D$	0.15	0.10	0.11	0.10				% w/w	0.01	A-T-024s
Magnesium BRE (water sol 2:1)$_D$	4	6	5	6				mg/l	1	A-T-SOLMETS

Report Notes

General

•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript "#"	Accredited to ISO 17025
Superscript "M"	Accredited to MCertS
Superscript "U"	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript "A"	Analysis performed on as-received Sample
Subscript "D"	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript "D" on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript "^"	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.
Quantification: Generally a 2 stage process including visual identification, hand picking and weighing, and fibre counting. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres). "TRACE" will be reported as a quantification result.
PLEASE INFORM THE LABORATORY IF YOU WOULD LIKE THE STAGE 3 SEDIMENTATION PROCESS CARRIED OUT. Note this will be subcontracted.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs
Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.					

Soil Chemical Analysis:
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH by method A-T-007:
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

Electrical Conductivity of water by method A-T-037:
Results greater than 12900µS/cm @ 25^0C / 11550µS/cm @ 20^0C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Murray Rix (Northern) Ltd, Andrew House , Hadfield Street, Dukinfield , Dukinfield, SK16 4QX

Project: Plot 2, Marchwiel, Wrexham

Clients Project No: N/A

Project No: 24/12468

Date Received: 23/12/2024 (pm)

Cool Box Temperatures (°C): 8.2

Lab Sample ID	24/12468/1	24/12468/2	24/12468/3	24/12468/4	24/12468/5	24/12468/6	24/12468/7	24/12468/8	24/12468/9	24/12468/10	24/12468/11
Client Sample No	613615	613620	613623	616804	616805	616809	616810	616813	616815	616817	616819
Client Sample ID/Depth	CP02 5.00-5.45m	CP11 4.00-4.45m	CP10 8.00-8.45m	CP4 6.00-6.45m	CP5 0.60m	CP6 6.00-6.45m	CP7 6.50-6.95m	CP8 5.00-5.45m	CP9 6.70-7.15m	CP12 4.40-4.85m	CP13 5.00-5.45m
Date Sampled	03/12/24	03/12/24	03/12/24								
Deviation Code											
E (no date)				✓	✓	✓	✓	✓	✓	✓	✓
F	✓	✓	✓								

Key
E (no date) *No sampling date provided (all results affected if not provided)*
F *Maximum holding time exceeded between sampling date and analysis for analytes listed below*

HOLDING TIME EXCEEDANCES

Lab Sample ID	24/12468/1	24/12468/2	24/12468/3
Client Sample No	613615	613620	613623
Client Sample ID/Depth	CP02 5.00-5.45m	CP11 4.00-4.45m	CP10 8.00-8.45m
Date Sampled	03/12/24	03/12/24	03/12/24
Sulphate BRE (water sol 2:1)	✓	✓	✓
Sulphate BRE (acid sol)	✓	✓	✓
Chloride BRE, SO4 equiv. (water sol 2:1)	✓	✓	✓
Nitrate BRE, SO4 equiv. (water sol 2:1)	✓	✓	✓

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	24/12468/1	24/12468/2	24/12468/3	24/12468/4	24/12468/5	24/12468/6	24/12468/7	24/12468/8	24/12468/9	24/12468/10	24/12468/11
Client Sample No	613615	613620	613623	616804	616805	616809	616810	616813	616815	616817	616819
Client Sample ID/Depth	CP02 5.00-5.45m	CP11 4.00-4.45m	CP10 8.00-8.45m	CP4 6.00-6.45m	CP5 0.60m	CP6 6.00-6.45m	CP7 6.50-6.95m	CP8 5.00-5.45m	CP9 6.70-7.15m	CP12 4.40-4.85m	CP13 5.00-5.45m
Date Sampled	03/12/24	03/12/24	03/12/24								
A-T-024s	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025
A-T-026s	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025
A-T-028s	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025
A-T-031s	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025	06/01/2025
A-T-033s	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025
A-T-044	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025	03/01/2025
A-T-SOLMETS	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025	07/01/2025

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client Tier Environmental Ltd

Address Suite 513
Chadwick House
Warrington Road
Birchwood
WA3 6AE

Contract TE1890 -
Plot 2, Marchwiel, Wrexham

Job Number MRN 25010/3
Date of Issue 20 January 2025
Pages 1 of 39

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

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

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

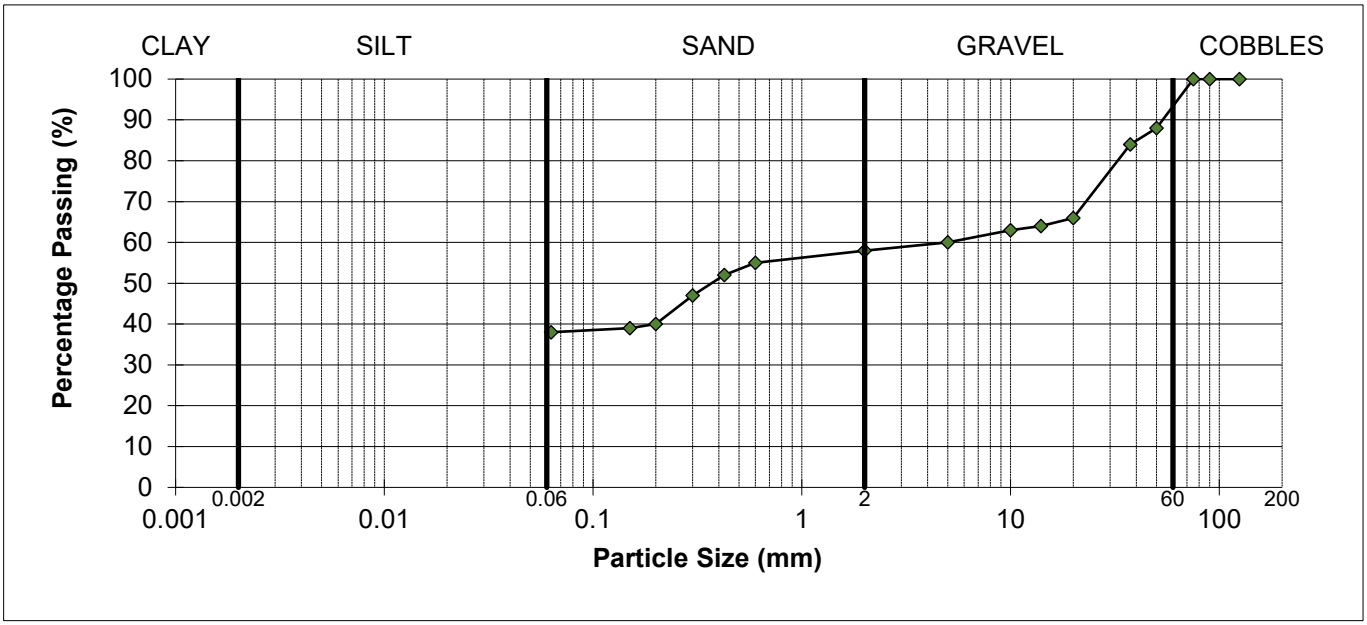
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP09 0.6-1.0 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613630	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty sandy very gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	60	
90	100		2	58	
75	100		0.6	55	
50	88		0.425	52	
37.5	84		0.3	47	
20	66		0.2	40	
14	64		0.15	39	
10	63		0.063	38	



SOIL FRACTIONS			
COBBLES	6%	SAND	20%
GRAVEL	36%	SILT / CLAY	38%

REMARKS
As received water content = 14.5%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

M U R R A Y R I X

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PARTICLE SIZE DISTRIBUTION

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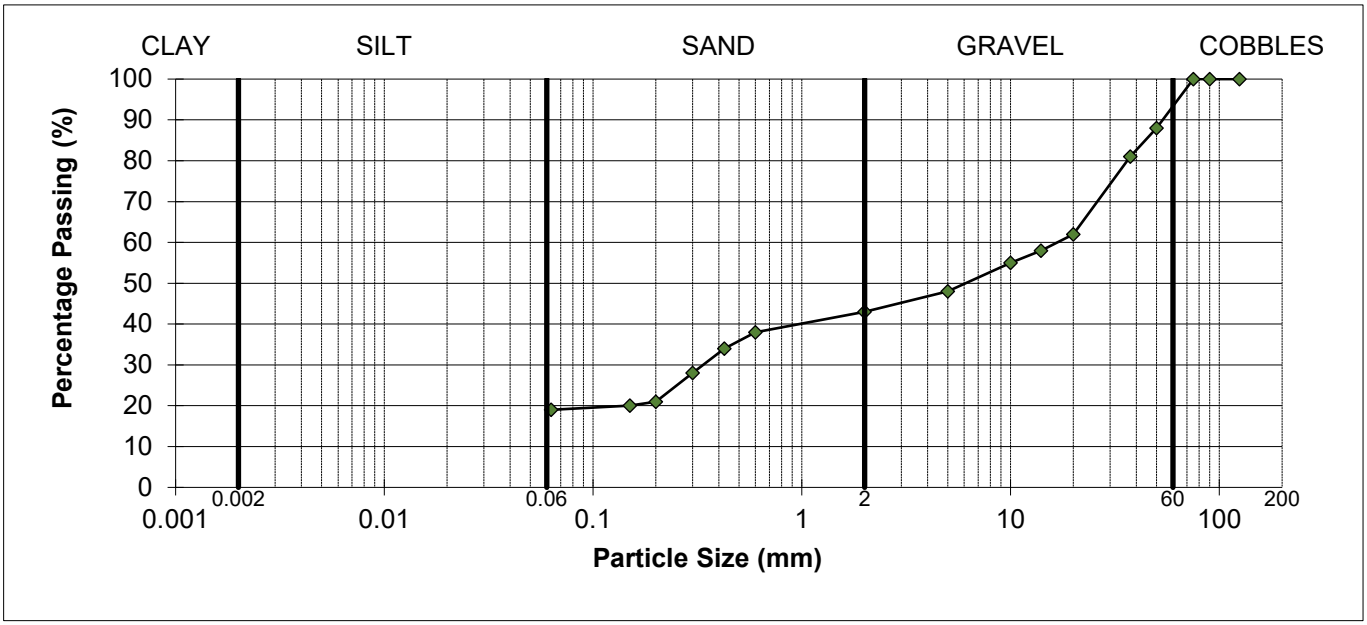
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP10 0.5-0.9 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613631	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown clayey SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	48	
90	100		2	43	
75	100		0.6	38	
50	88		0.425	34	
37.5	81		0.3	28	
20	62		0.2	21	
14	58		0.15	20	
10	55		0.063	19	



SOIL FRACTIONS			
COBBLES	6%	SAND	24%
GRAVEL	51%	SILT / CLAY	19%

REMARKS
As received water content = 11.8%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

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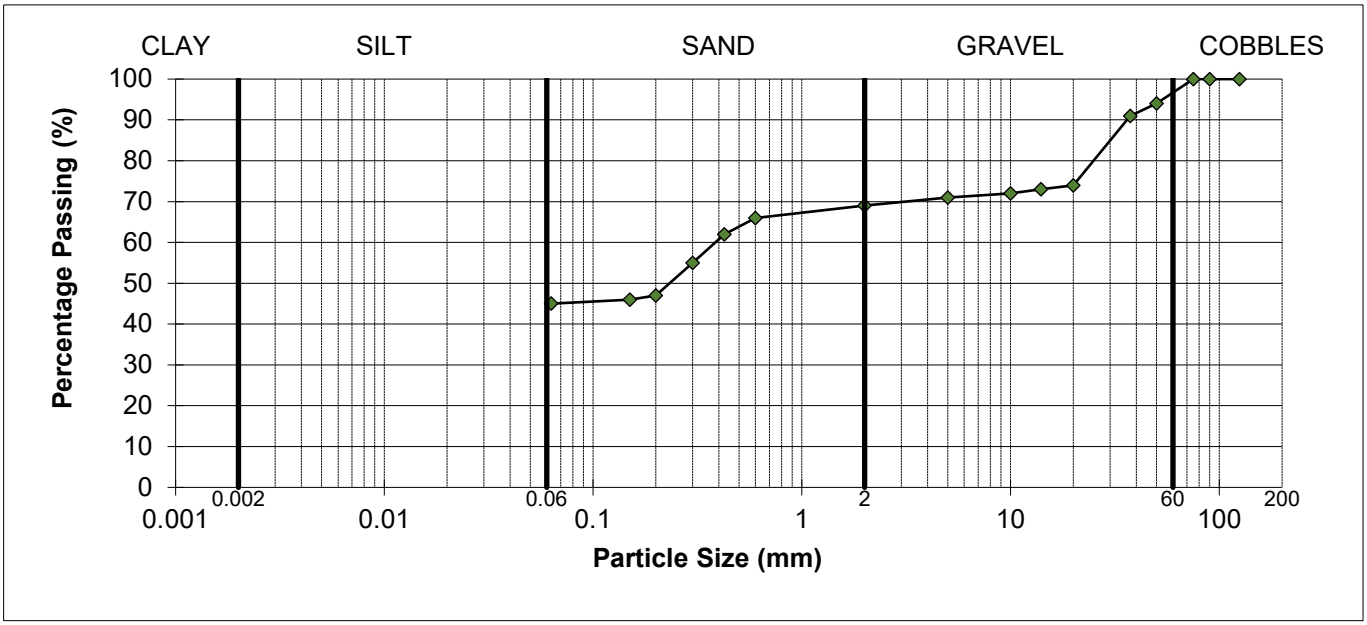
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP11 0.8-1.3 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613632	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty sandy very gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	71	
90	100		2	69	
75	100		0.6	66	
50	94		0.425	62	
37.5	91		0.3	55	
20	74		0.2	47	
14	73		0.15	46	
10	72		0.063	45	



SOIL FRACTIONS			
COBBLES	3%	SAND	24%
GRAVEL	28%	SILT / CLAY	45%

REMARKS
As received water content = 13.3%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

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ANDREW HOUSE, HADFIELD STREET,
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UKAS TESTING 1580

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PARTICLE SIZE DISTRIBUTION

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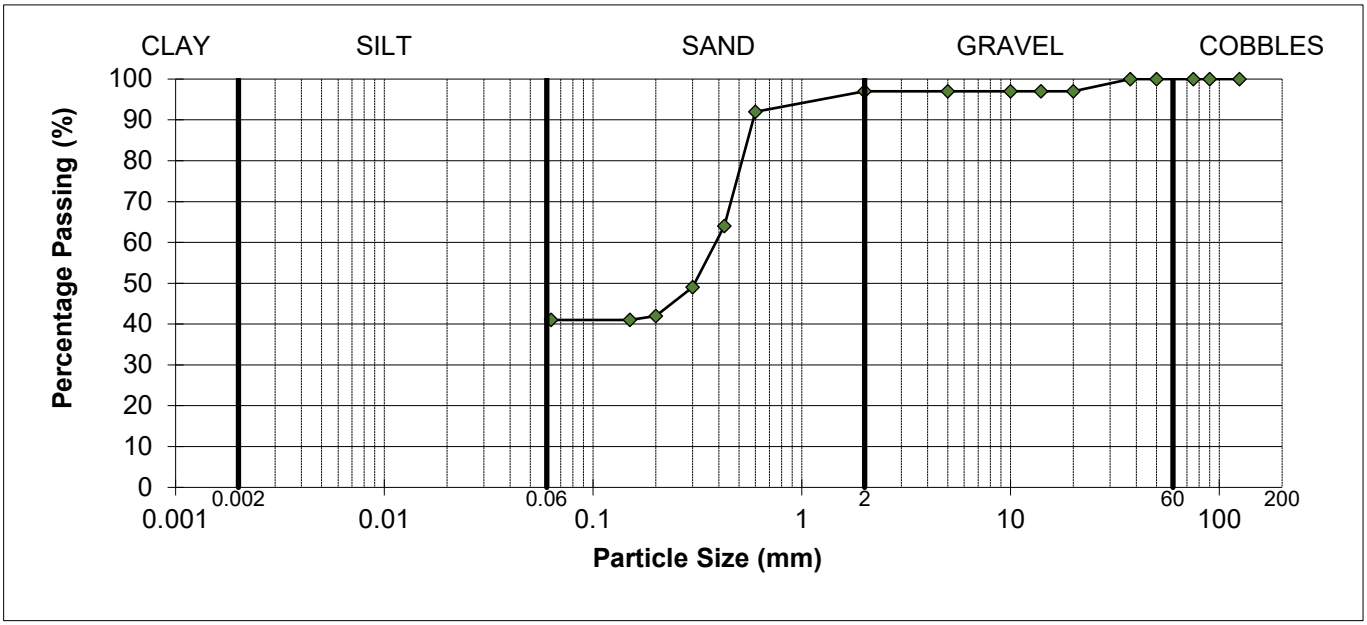
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP01 1.1 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613633	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	97	
90	100		2	97	
75	100		0.6	92	
50	100		0.425	64	
37.5	100		0.3	49	
20	97		0.2	42	
14	97		0.15	41	
10	97		0.063	41	



SOIL FRACTIONS			
COBBLES	0%	SAND	56%
GRAVEL	3%	SILT / CLAY	41%

REMARKS
As received water content = 14.4%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

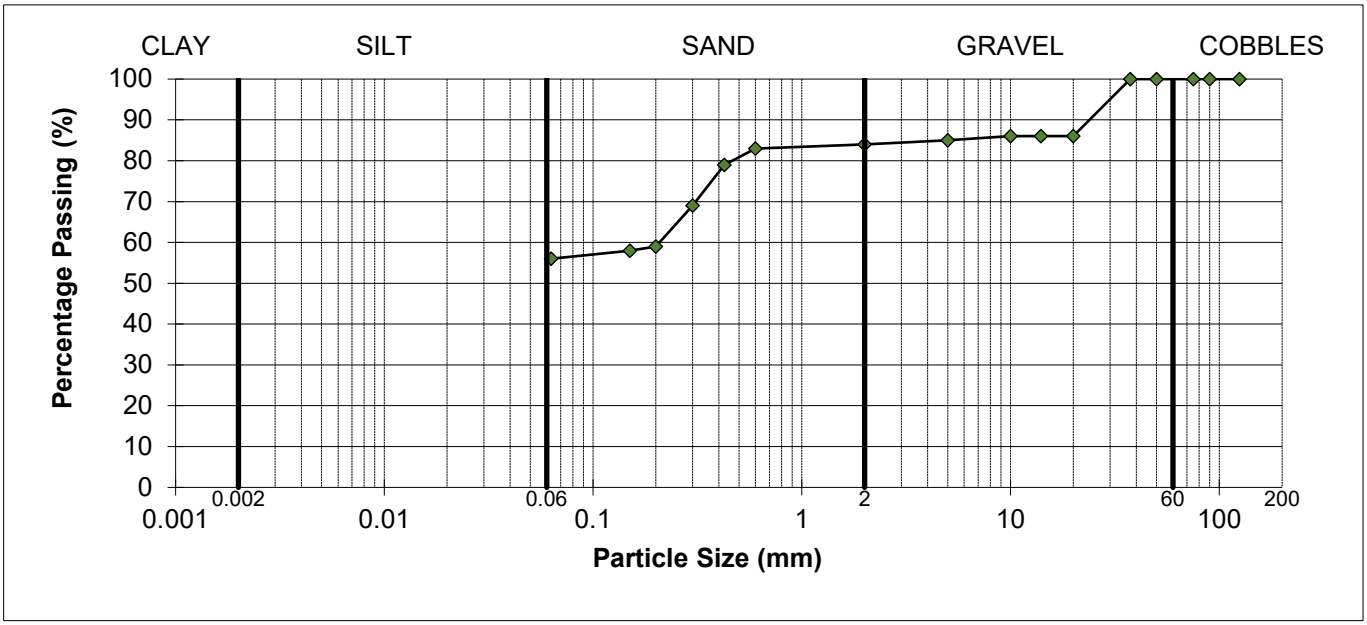
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP06 0.85 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613637	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	85	
90	100		2	84	
75	100		0.6	83	
50	100		0.425	79	
37.5	100		0.3	69	
20	86		0.2	59	
14	86		0.15	58	
10	86		0.063	56	



SOIL FRACTIONS			
COBBLES	0%	SAND	28%
GRAVEL	16%	SILT / CLAY	56%

REMARKS
As received water content = 16.2%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

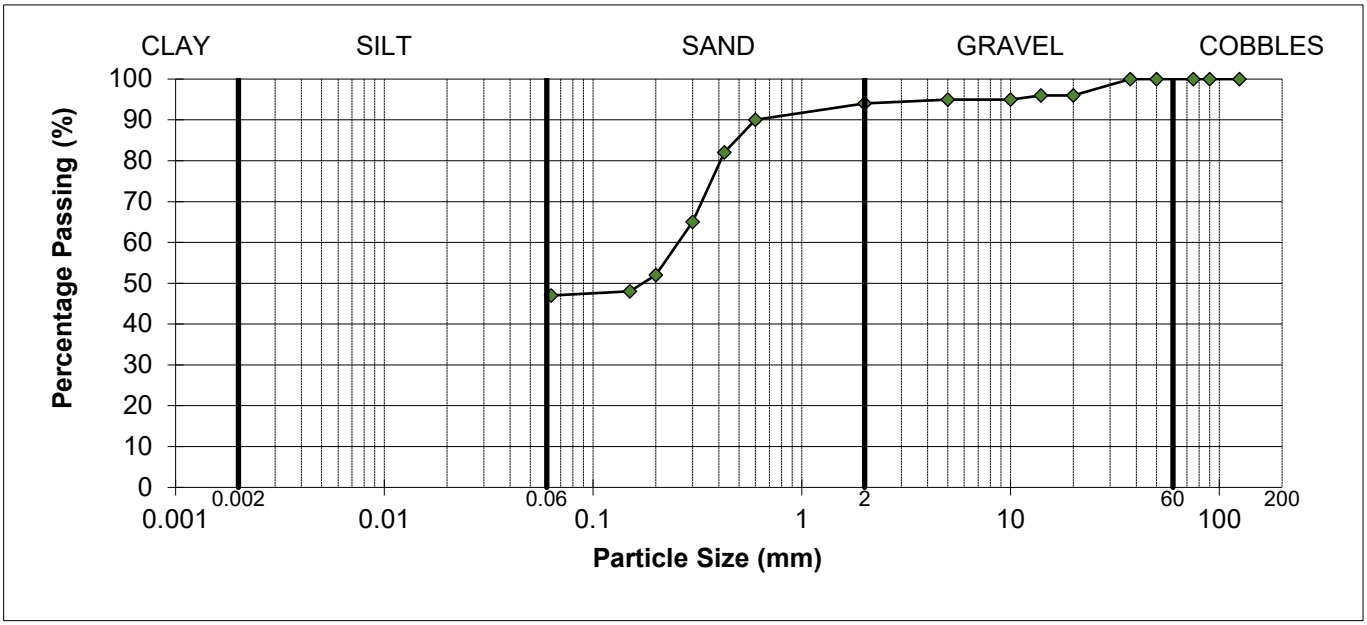
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP08 0.6 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613638	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	95	
90	100		2	94	
75	100		0.6	90	
50	100		0.425	82	
37.5	100		0.3	65	
20	96		0.2	52	
14	96		0.15	48	
10	95		0.063	47	



SOIL FRACTIONS			
COBBLES	0%	SAND	47%
GRAVEL	6%	SILT / CLAY	47%

REMARKS
As received water content = 16.2%

SIGNED

NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

M U R R A Y R I X

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

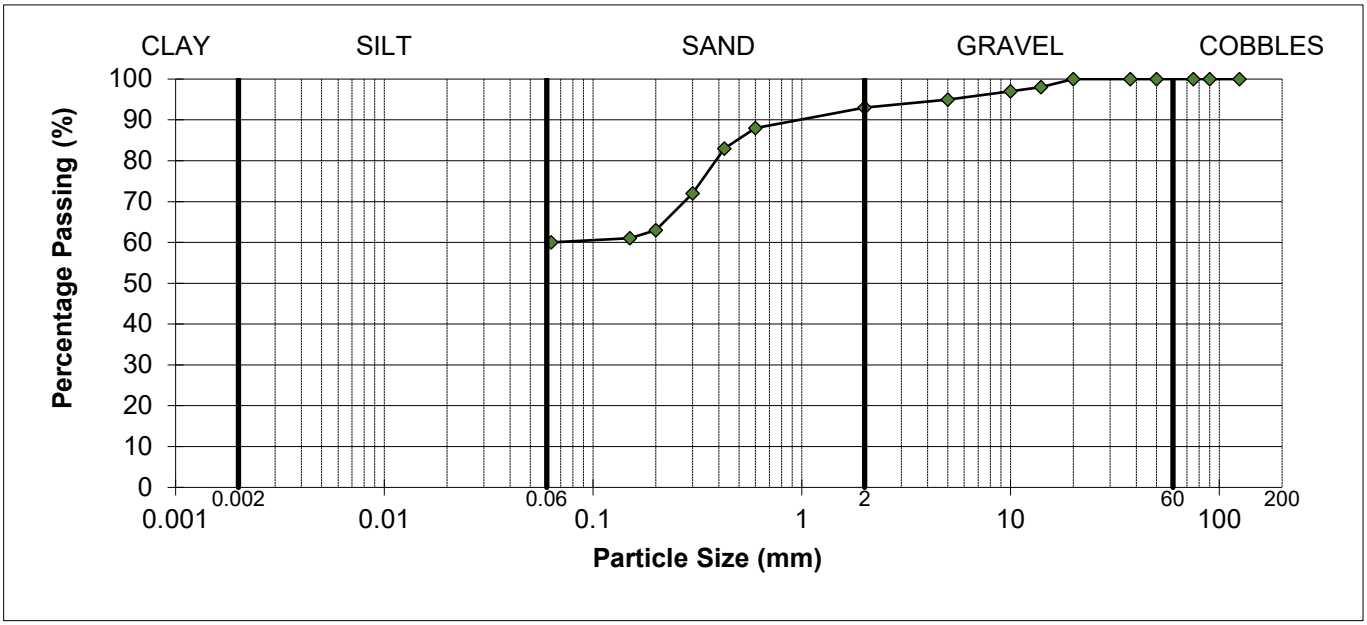
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP12 0.5 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613639	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	95	
90	100		2	93	
75	100		0.6	88	
50	100		0.425	83	
37.5	100		0.3	72	
20	100		0.2	63	
14	98		0.15	61	
10	97		0.063	60	



SOIL FRACTIONS			
COBBLES	0%	SAND	33%
GRAVEL	7%	SILT / CLAY	60%

REMARKS
As received water content = 25.4%

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NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

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TEST CERTIFICATE

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

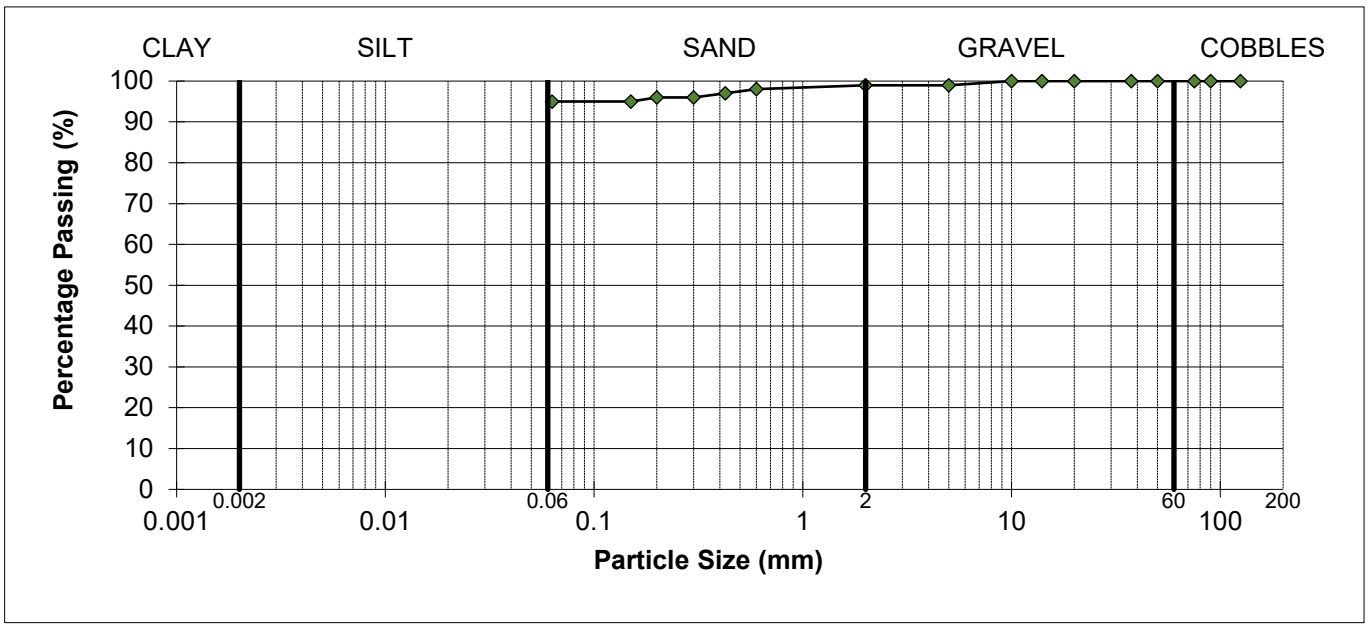
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP12 1 B	DATE SAMPLED	Not advised
LAB SAMPLE No	613640	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100		5	99	
90	100		2	99	
75	100		0.6	98	
50	100		0.425	97	
37.5	100		0.3	96	
20	100		0.2	96	
14	100		0.15	95	
10	100		0.063	95	



SOIL FRACTIONS			
COBBLES	0%	SAND	4%
GRAVEL	1%	SILT / CLAY	95%

REMARKS
As received water content = 21.2%

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NAME O.P. Davies BA (Hons) (Director / Head of Laboratory) DATE 20-Jan-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

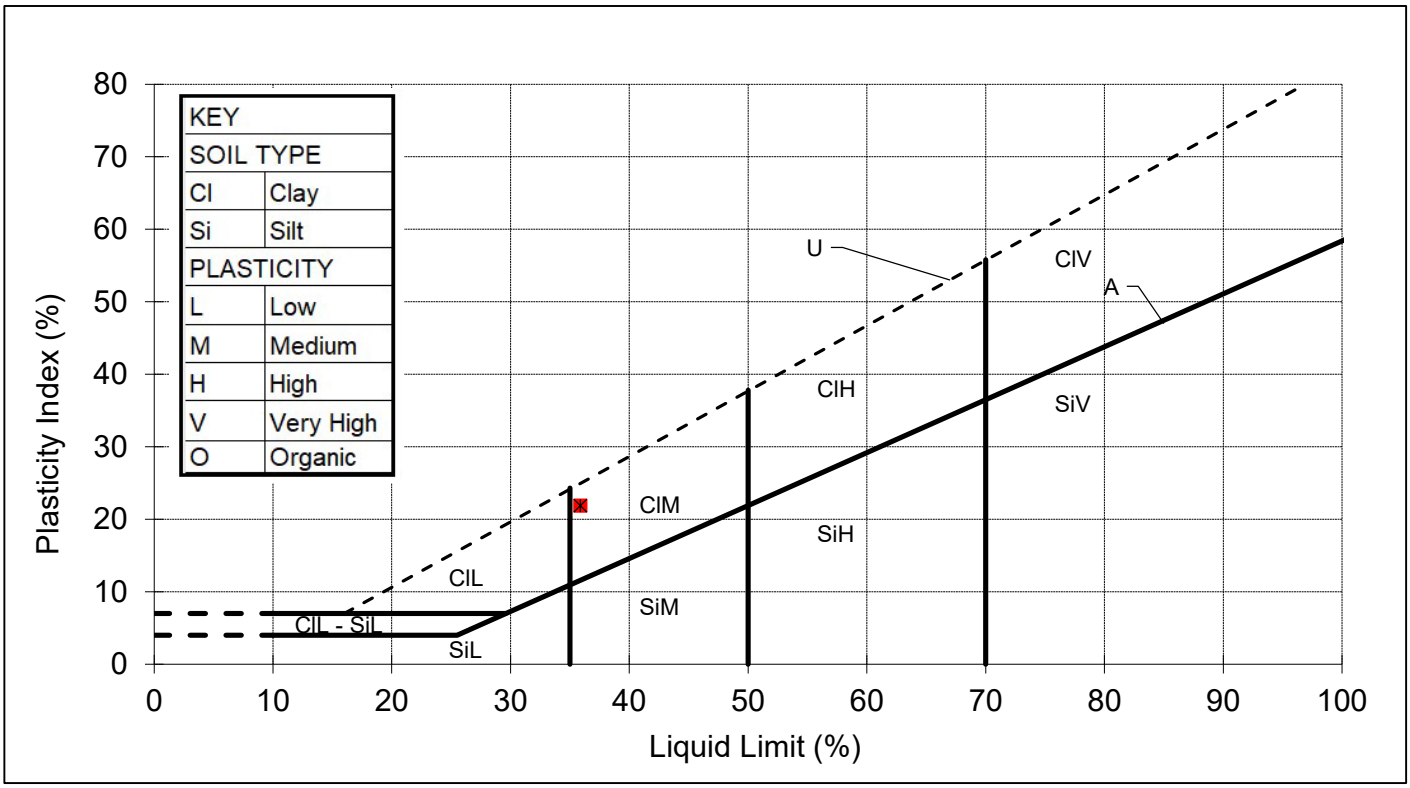
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH16 7.5-7.95 U	DATE SAMPLED	Not advised
SAMPLE No.	613625	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.2	35.3	1.019	
Determination 2 (avg)	18.9	35.1		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
18.6	36	14	22	98



REMARKS

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TEST CERTIFICATE

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

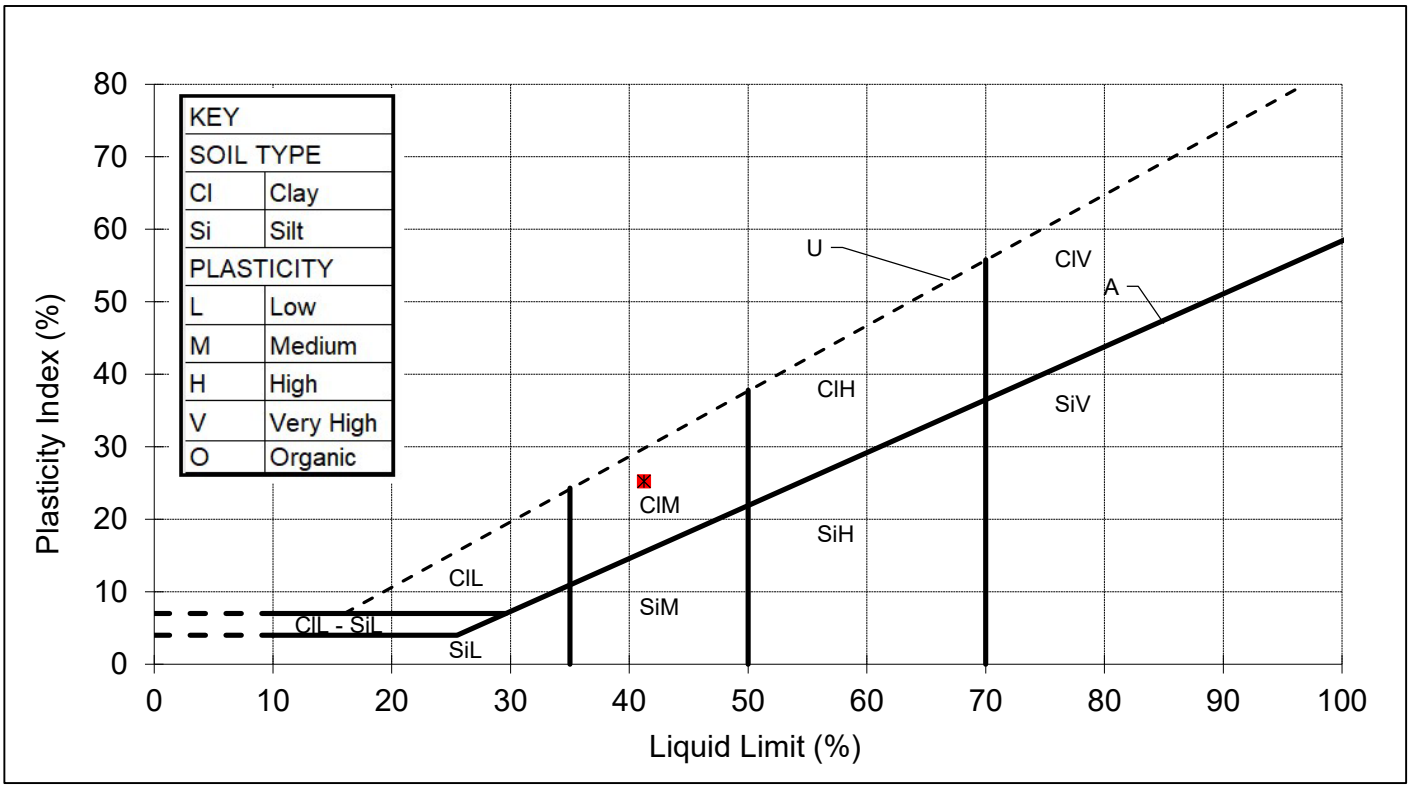
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH17 1.2-1.65 U	DATE SAMPLED	Not advised
SAMPLE No.	613626	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.9	41.2	1.003	
Determination 2 (avg)	19.8	41.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
17.6	41	16	25	96



REMARKS

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TEST CERTIFICATE

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

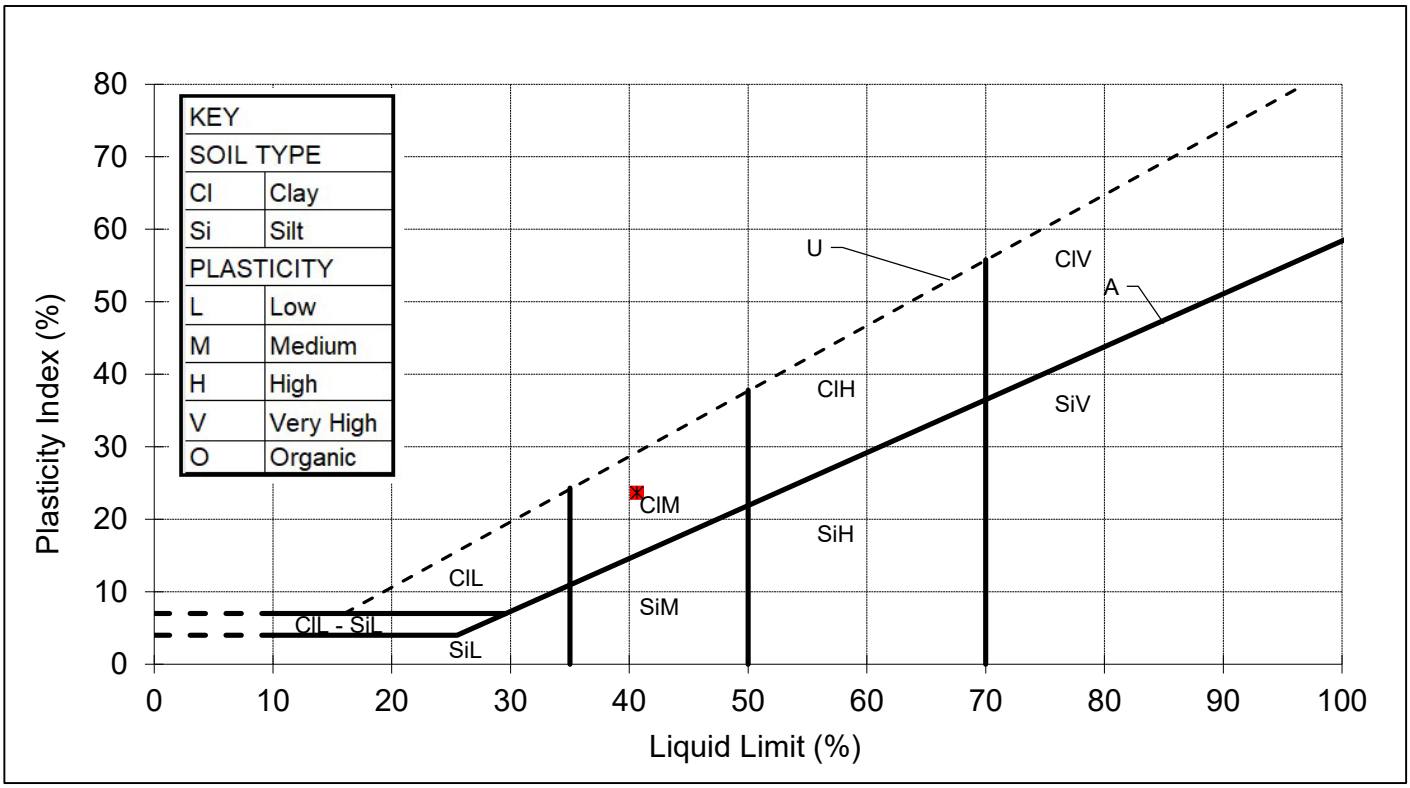
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP01 2.2 D	DATE SAMPLED	Not advised
SAMPLE No.	613601	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.5	39.7	1.027	
Determination 2 (avg)	18.5	39.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.0	41	17	24	95



REMARKS

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TEST CERTIFICATE

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

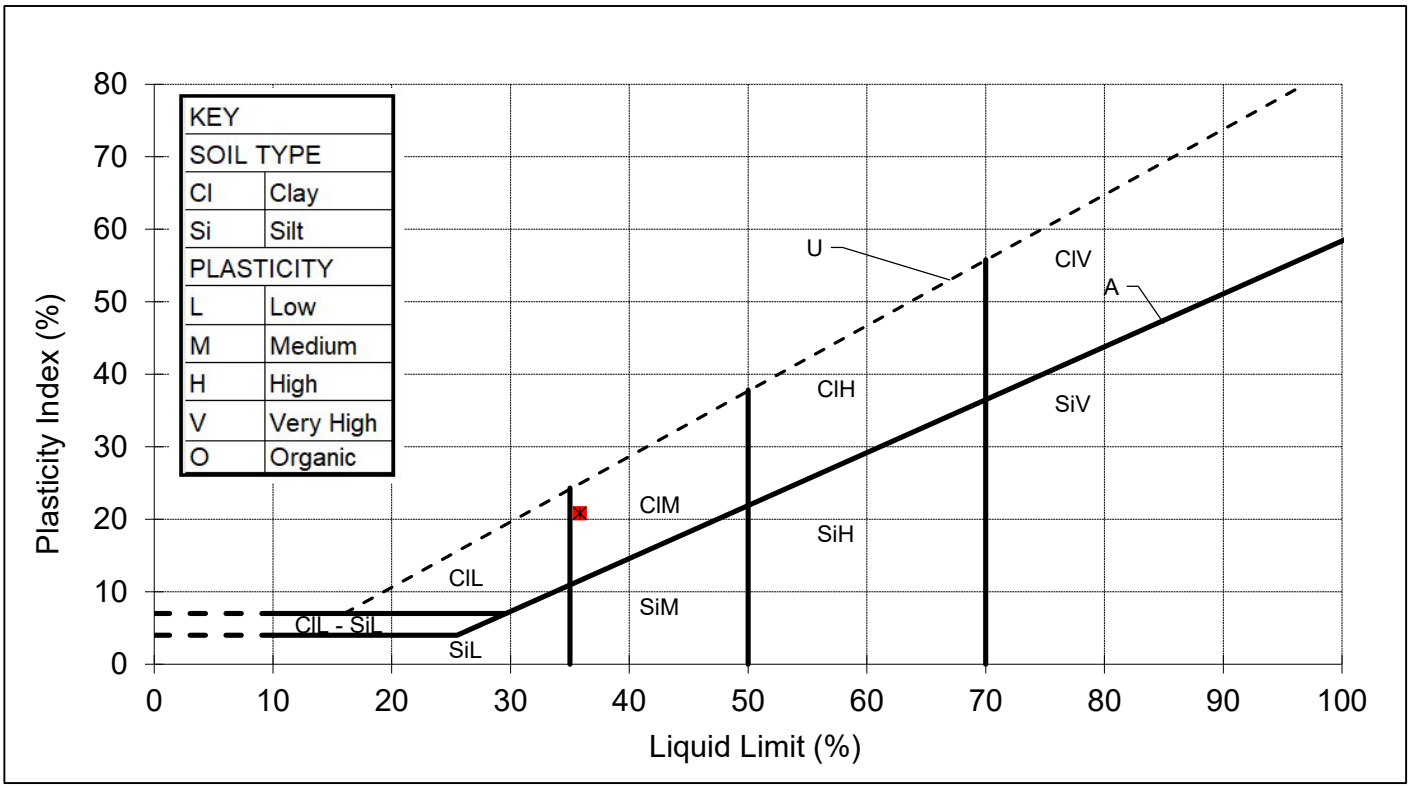
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP04 2 D	DATE SAMPLED	Not advised
SAMPLE No.	613602	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.2	36.5	0.983	
Determination 2 (avg)	21.0	36.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19.9	36	15	21	99



REMARKS

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

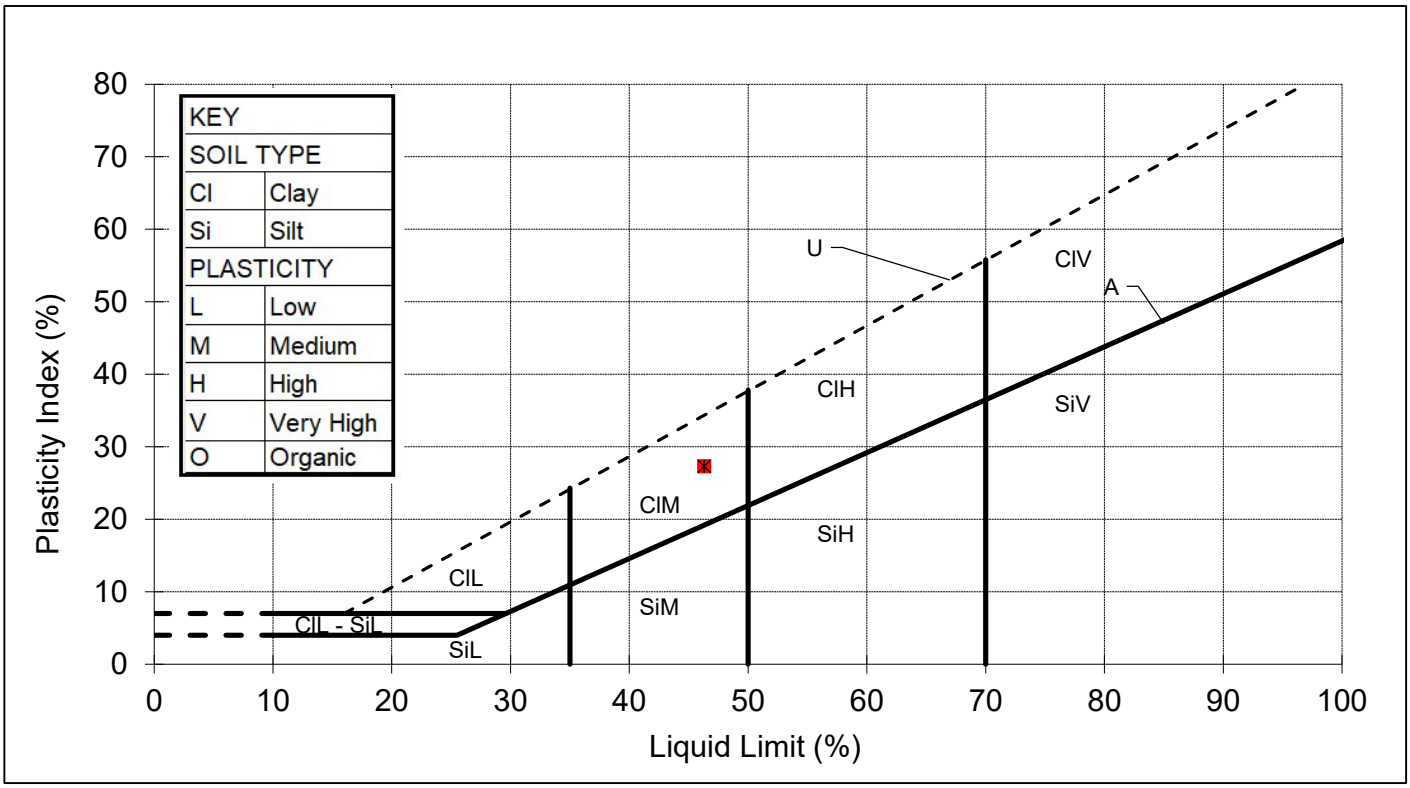
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP05 1.5 D	DATE SAMPLED	Not advised
SAMPLE No.	613603	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Orangey brown silty sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	46.2	1.000	
Determination 2 (avg)	20.0	46.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
25.0	46	19	27	90



REMARKS

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

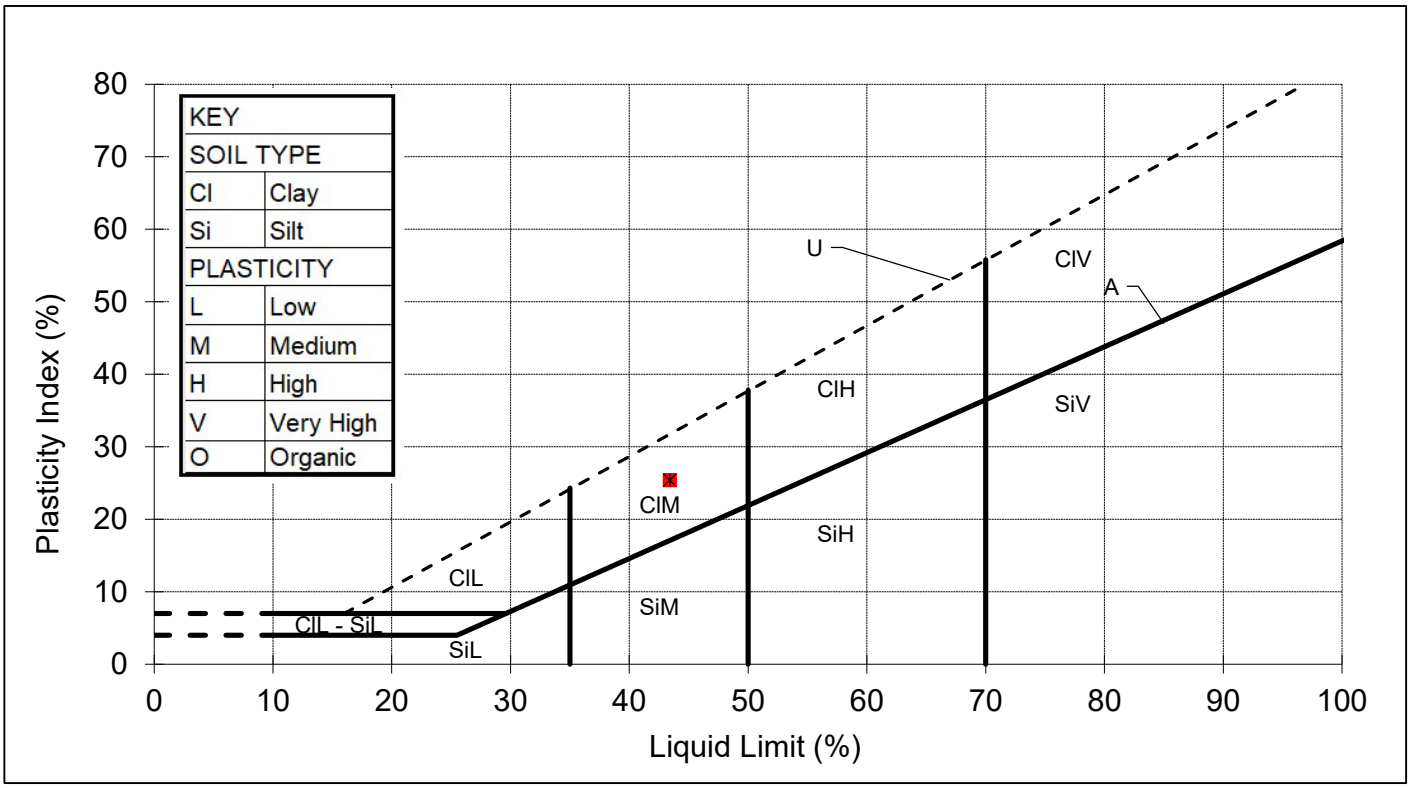
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP12 1 B	DATE SAMPLED	Not advised
SAMPLE No.	613640	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.8	43.3	1.001	
Determination 2 (avg)	20.1	43.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.8	43	18	25	86



REMARKS

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

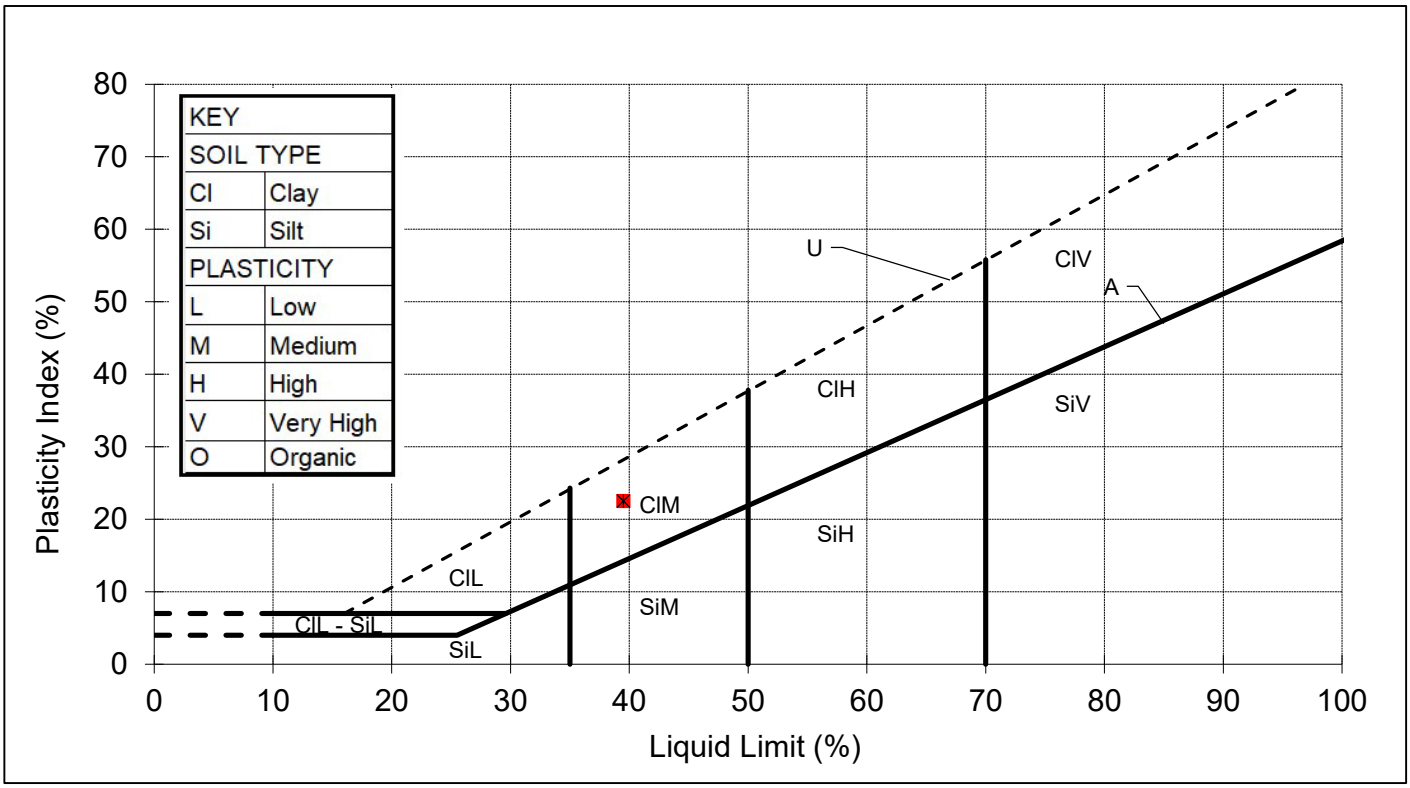
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP15 1.8 B	DATE SAMPLED	Not advised
SAMPLE No.	613642	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.2	39.6	0.998	
Determination 2 (avg)	20.0	39.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
19.9	39	17	22	97



REMARKS

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

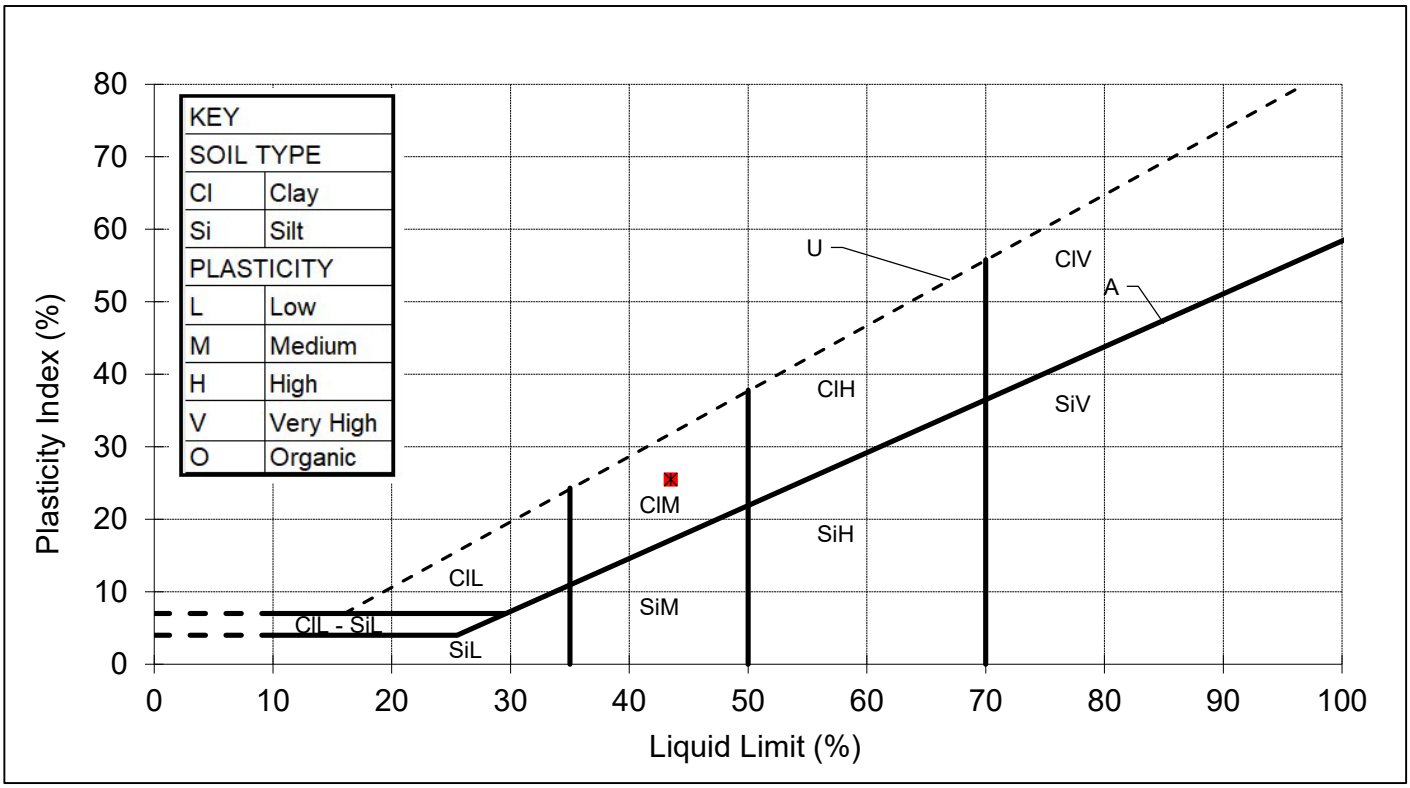
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS02 2 D	DATE SAMPLED	Not advised
SAMPLE No.	613604	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.6	43.2	1.009	
Determination 2 (avg)	19.5	43.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
21.5	43	18	25	100



REMARKS

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

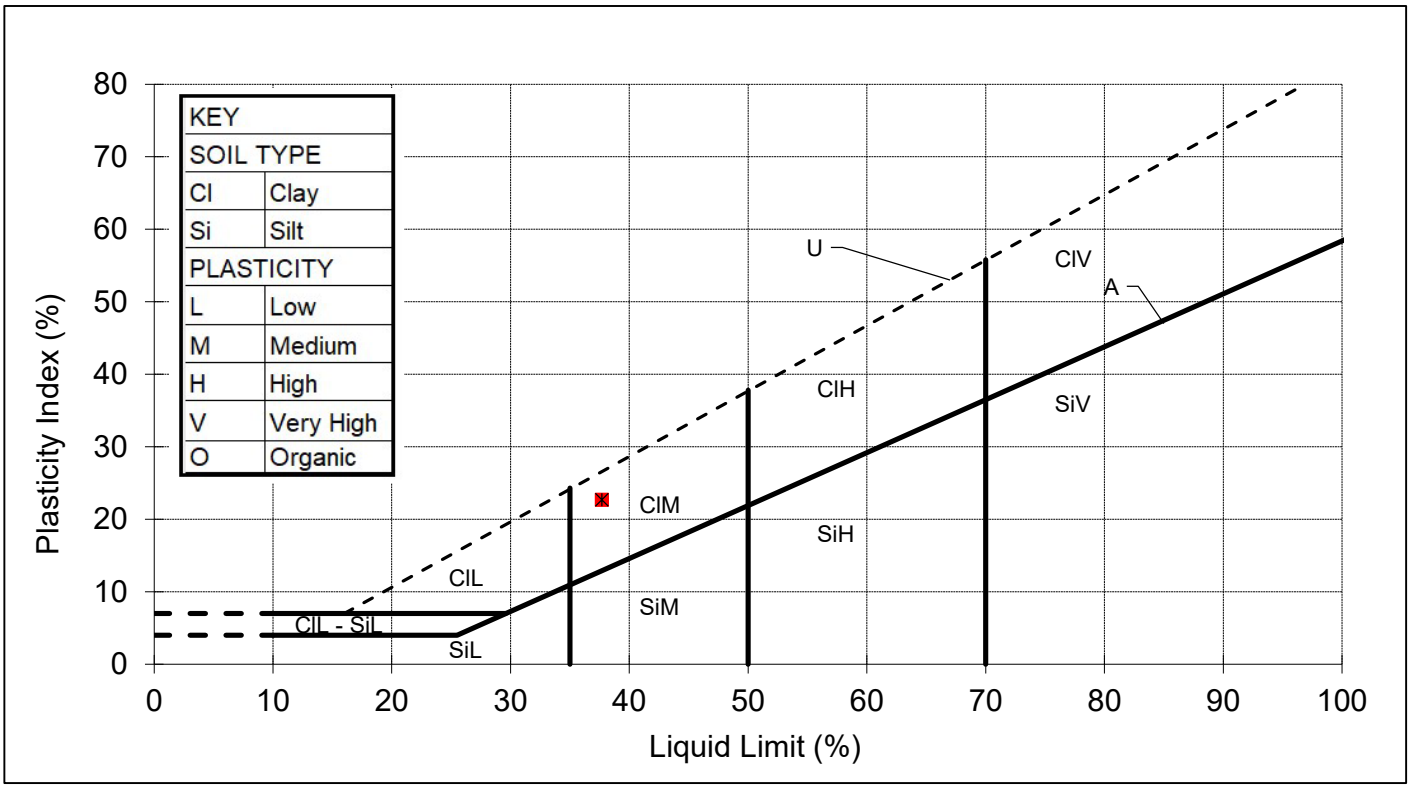
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS03 2 D	DATE SAMPLED	Not advised
SAMPLE No.	613605	DATE RECEIVED	11-Dec-24
DATE TESTED	06-Jan-25	SAMPLED BY	Client

MATERIAL	Reddish brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.5	38.6	0.979	
Determination 2 (avg)	21.3	38.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.3	38	15	23	92



REMARKS

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TEST CERTIFICATE

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

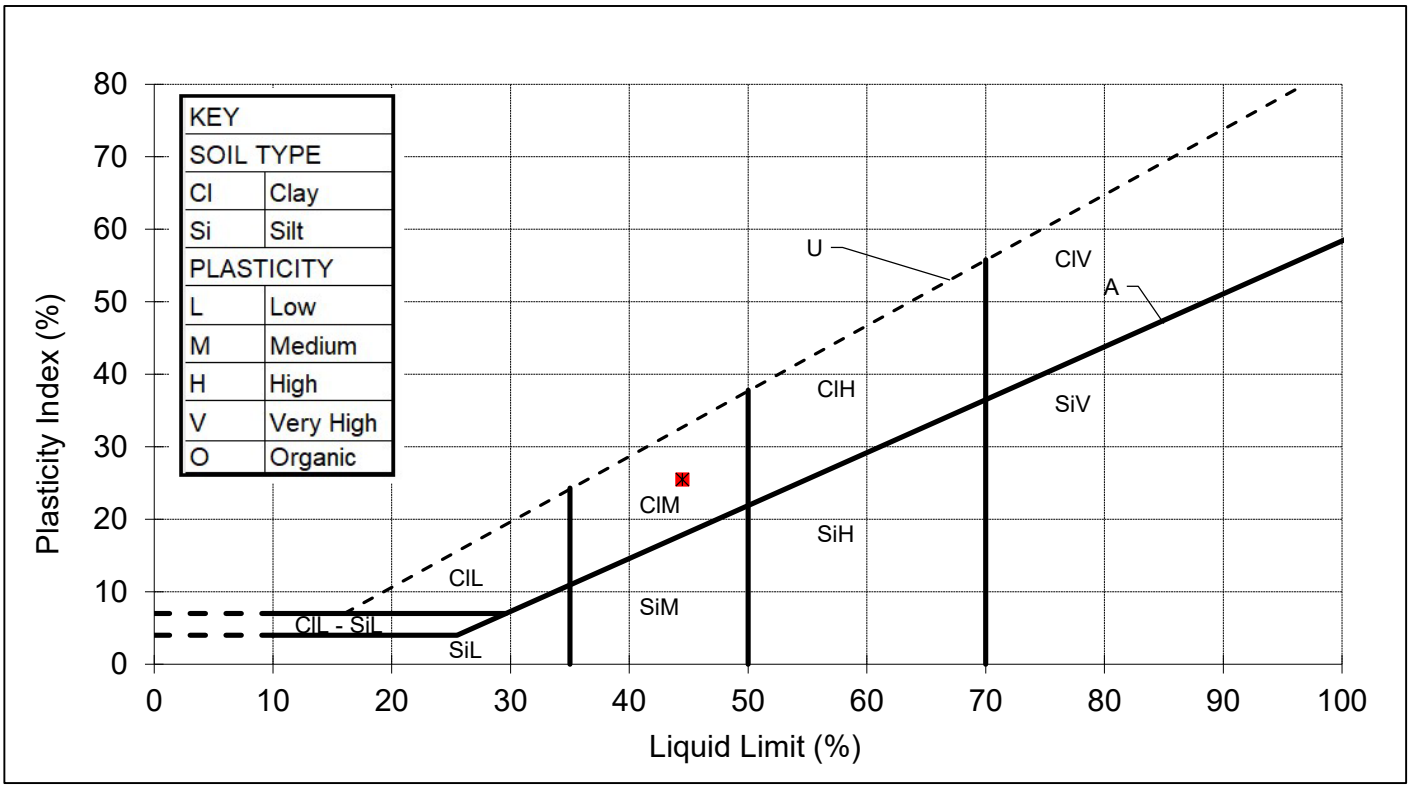
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS07 1.4 D	DATE SAMPLED	Not advised
SAMPLE No.	613606	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.1	44.4	0.997	
Determination 2 (avg)	20.3	44.8		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
26.2	44	19	25	99



REMARKS

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

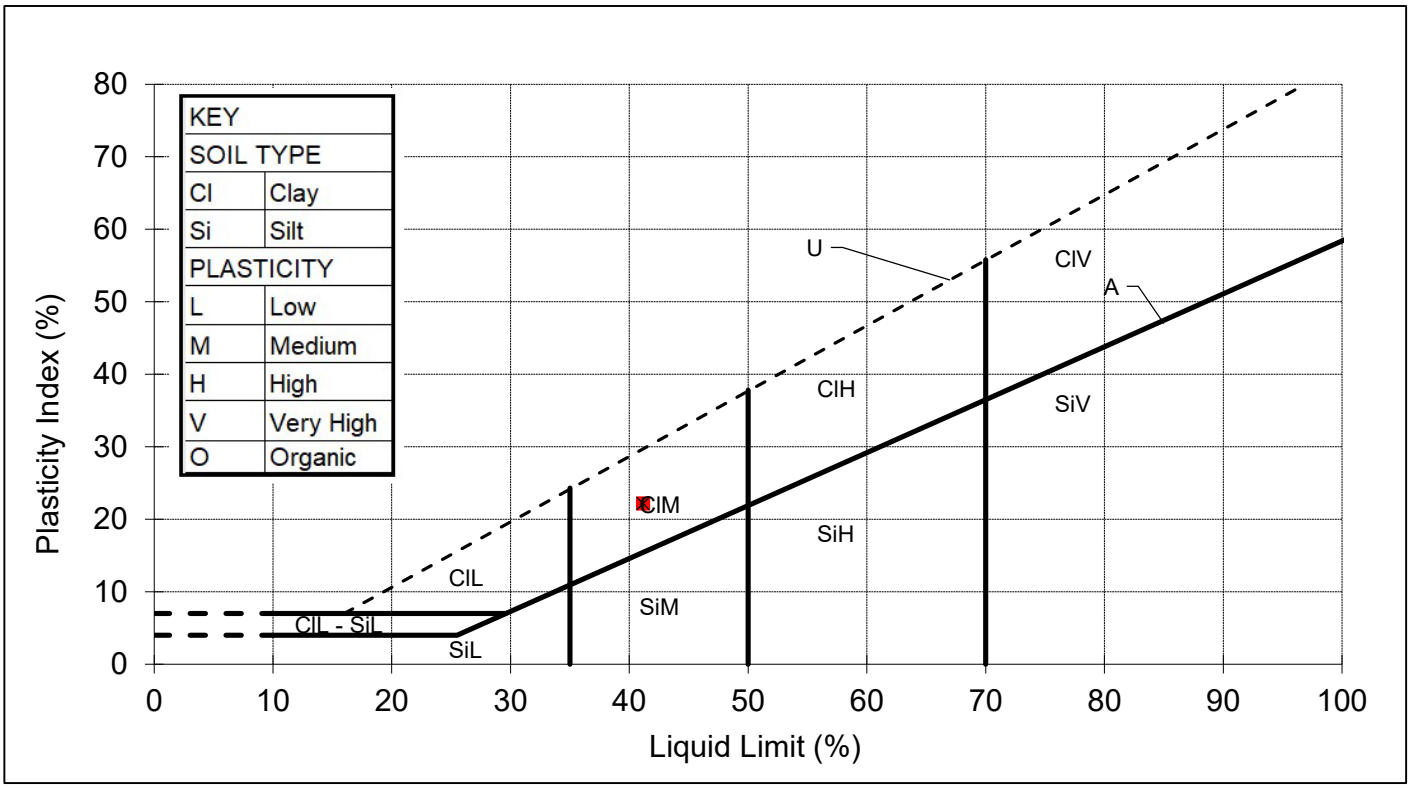
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS08 1 D	DATE SAMPLED	Not advised
SAMPLE No.	613607	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	23.8	43.1	0.955	
Determination 2 (avg)	23.7	43.1		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
23.5	41	19	22	98



REMARKS

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LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

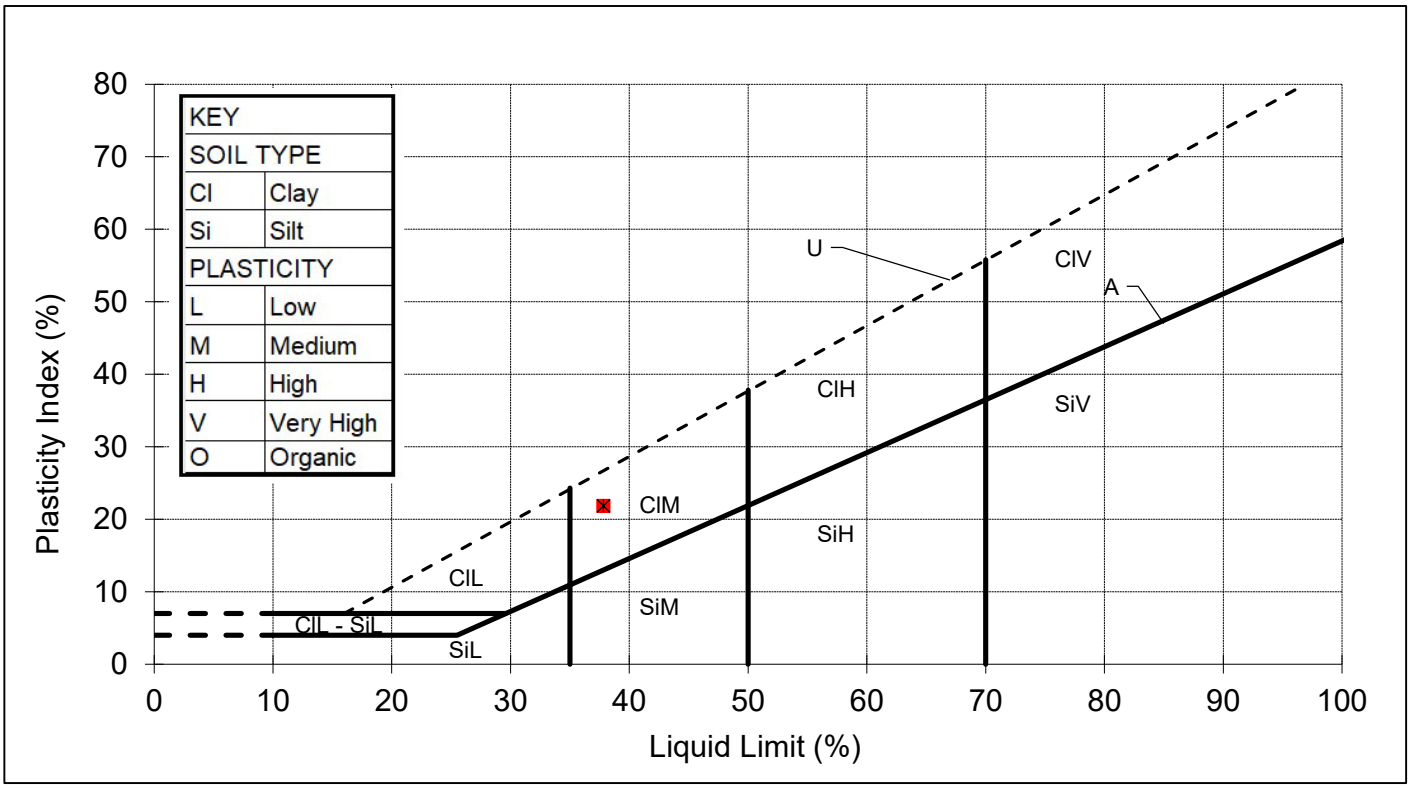
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS11 1.5 D	DATE SAMPLED	Not advised
SAMPLE No.	613608	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	22.2	39.2	0.967	
Determination 2 (avg)	22.0	39.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
23.0	38	16	22	95



REMARKS

SIGNED

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

DATE 20-Jan-25

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

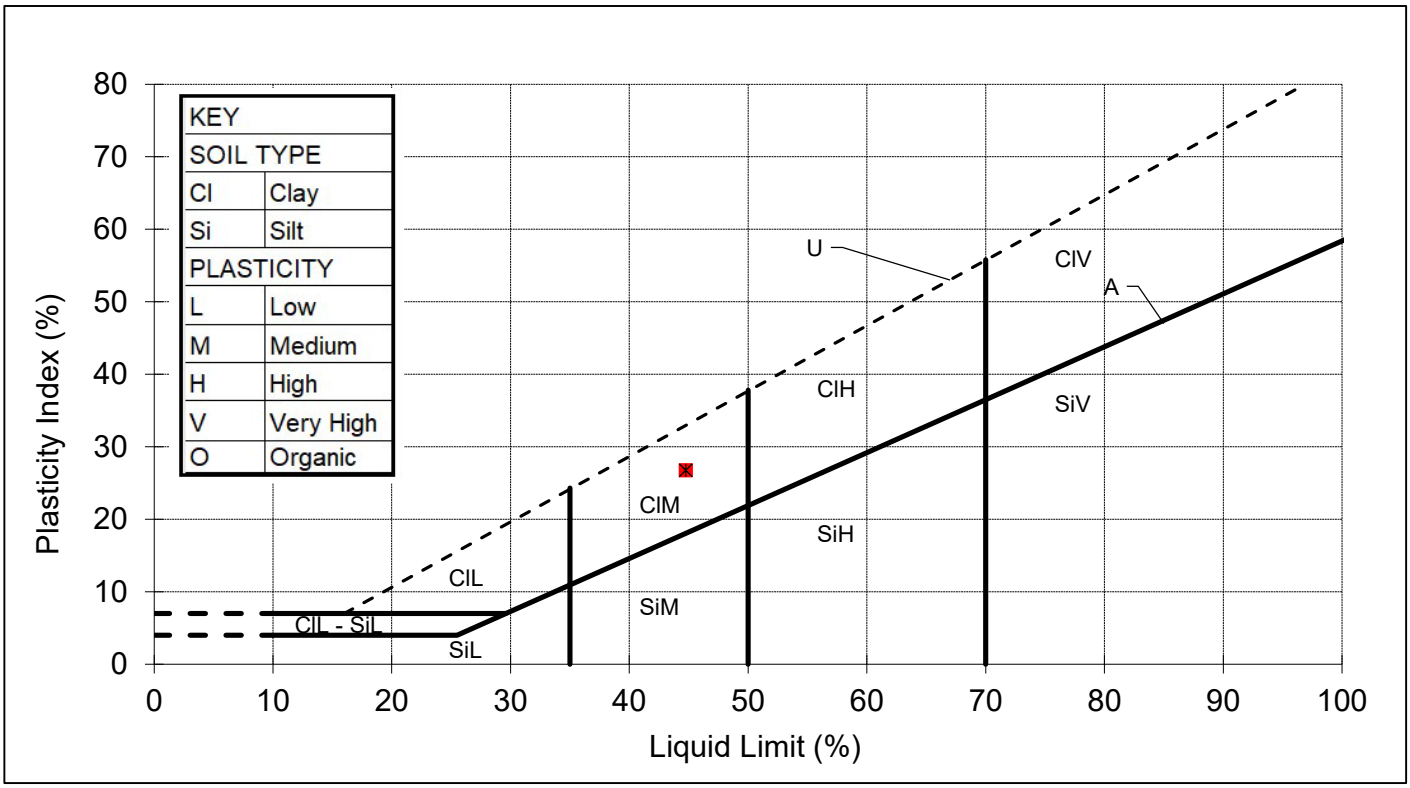
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS12 1.7 D	DATE SAMPLED	Not advised
SAMPLE No.	613609	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	45.2	0.994	
Determination 2 (avg)	20.7	44.8		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
24.1	45	18	27	99



REMARKS

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

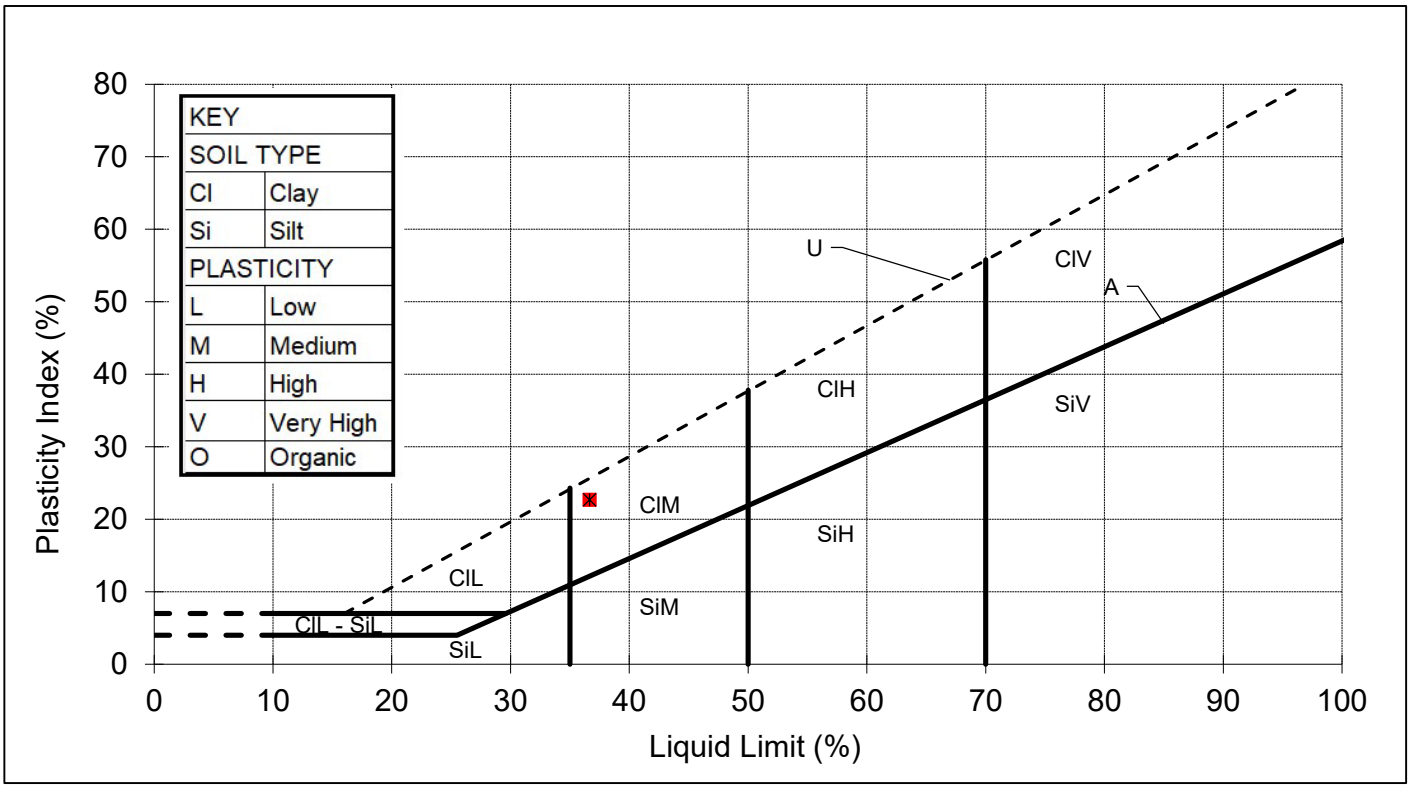
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS13 1.0-1.3 D	DATE SAMPLED	Not advised
SAMPLE No.	613610	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.6	36.9	0.990	
Determination 2 (avg)	20.7	37.2		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
22.8	37	14	23	97



REMARKS

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

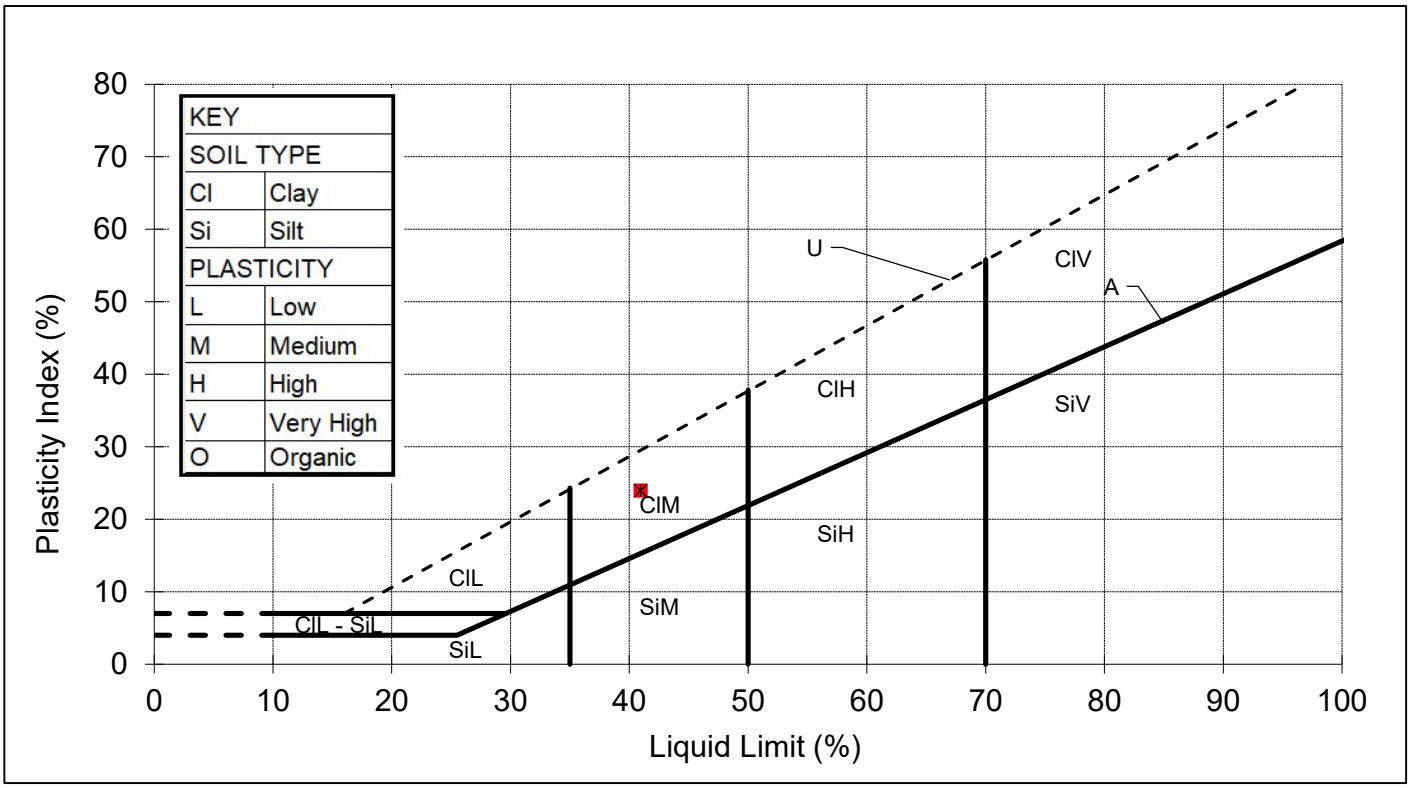
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS15 0.7-1.0 D	DATE SAMPLED	Not advised
SAMPLE No.	613611	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Grey brown mottled silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor
Determination 1 (avg)	20.0	41.0	0.998	from Clayton and Jukes 1978
Determination 2 (avg)	20.2	41.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
24.1	41	17	24	100



REMARKS

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

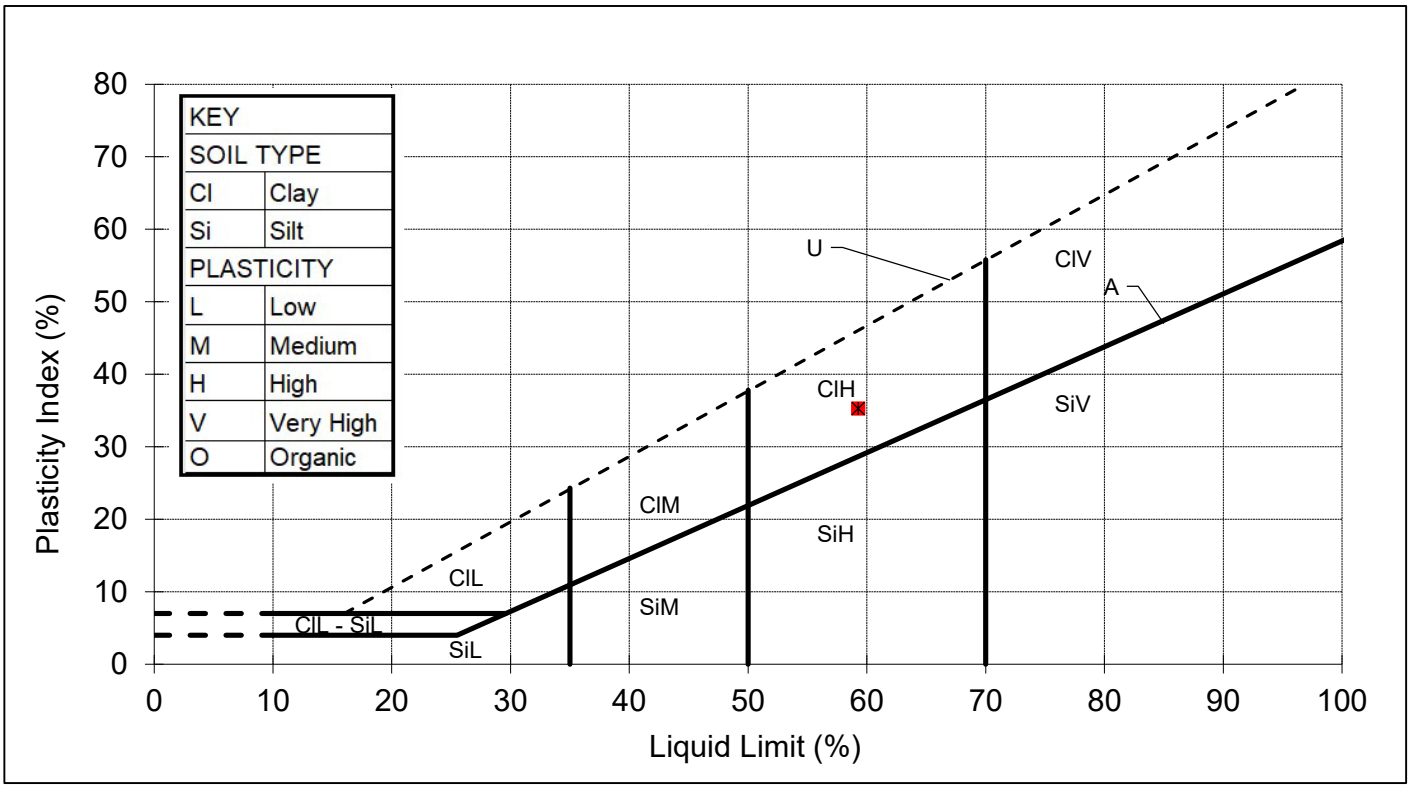
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS20 2 D	DATE SAMPLED	Not advised
SAMPLE No.	613612	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	16.5	55.8	1.066	
Determination 2 (avg)	16.4	55.4		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
30.8	59	24	35	100



REMARKS

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PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

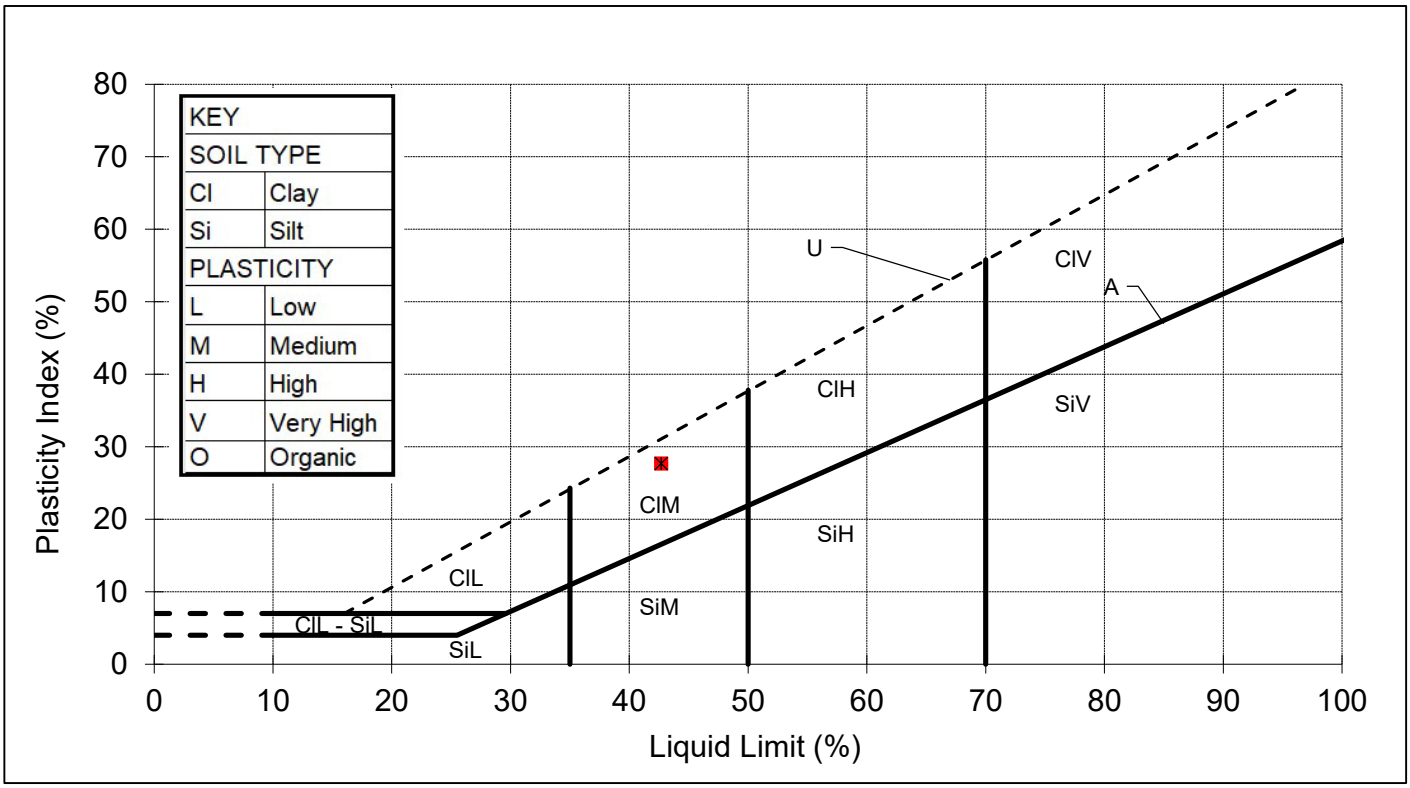
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	WS21 2 D	DATE SAMPLED	Not advised
SAMPLE No.	613613	DATE RECEIVED	11-Dec-24
DATE TESTED	07-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Hand Picked

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.7	41.8	1.023	
Determination 2 (avg)	18.6	41.6		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.4	43	15	28	98



REMARKS

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UKAS TESTING 1580

TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

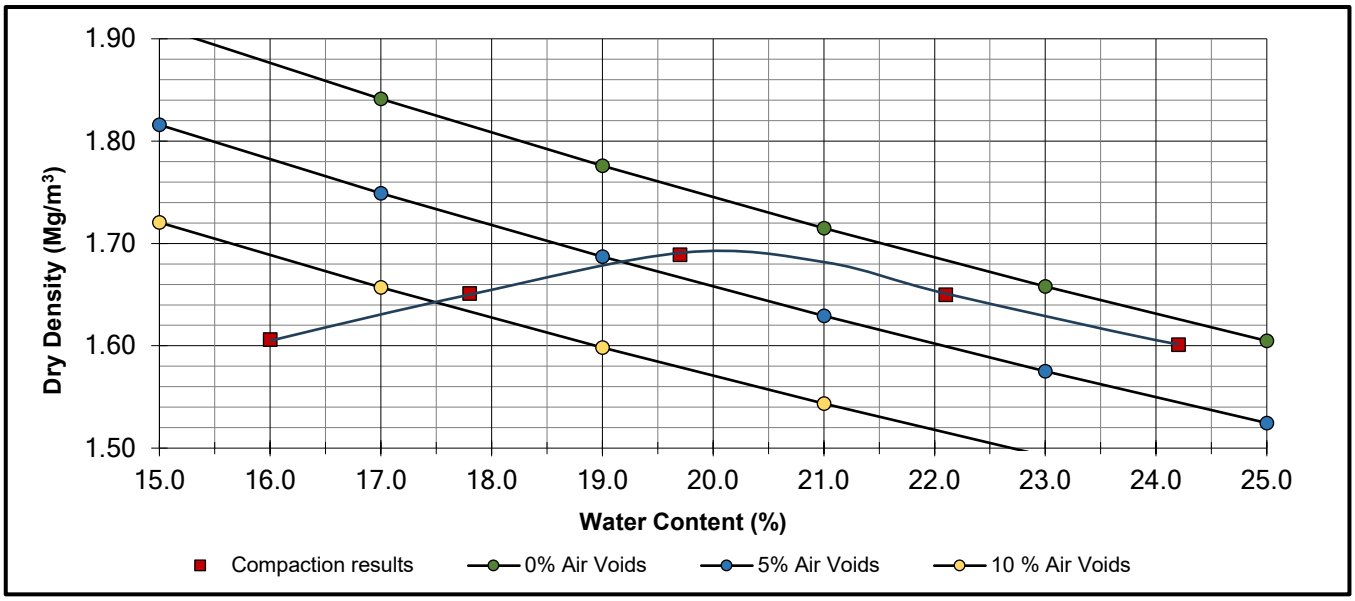
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP03 0.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613634	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slighty sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 1
RETAINED 20mm	0 %	PARTICLE DENSITY	2.68 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	16.0	1.606
2	17.8	1.651
3	19.7	1.689
4	22.1	1.650
5	24.2	1.601



OPTIMUM WATER CONTENT	**20**	(%)
MAXIMUM DRY DENSITY	**1.69**	(Mg/m^3)

REMARKS
As received water content = 19.6%

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

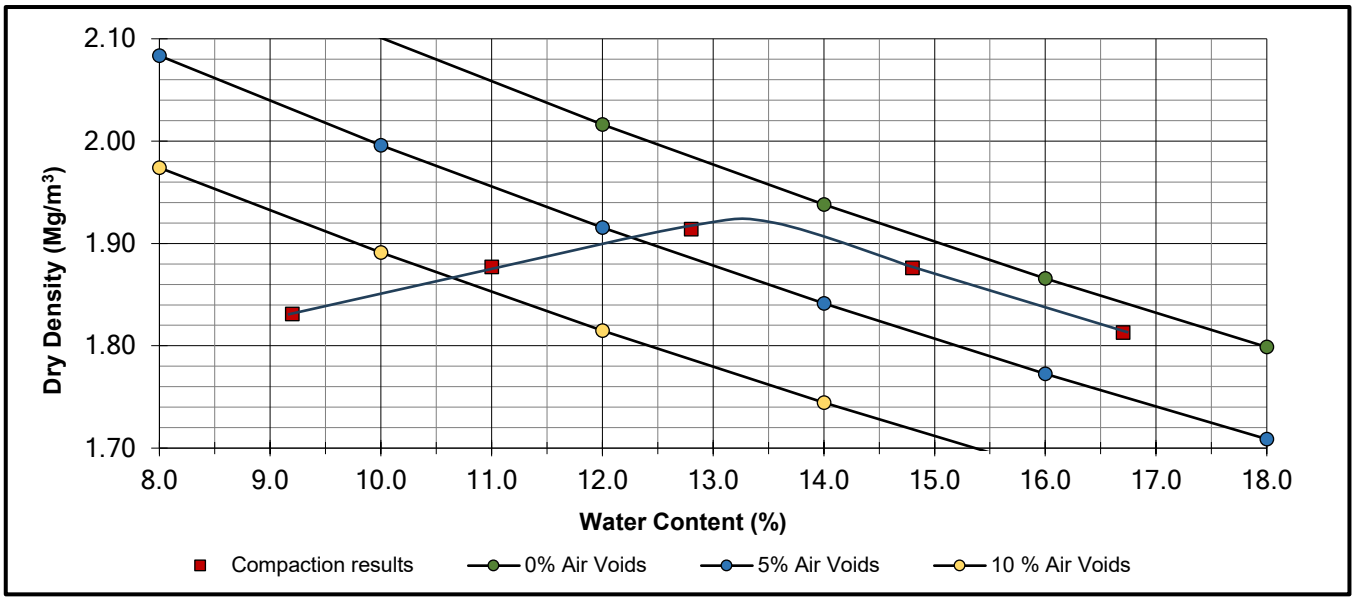
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP04 0.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613635	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown clay bound gravelly SAND
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 1
RETAINED 20mm	0 %	PARTICLE DENSITY	2.66 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	9.2	1.831
2	11.0	1.877
3	12.8	1.914
4	14.8	1.876
5	16.7	1.813



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**1.92**	(Mg/m^3)

REMARKS
As received water content = 15.8%

NAME O.P. Davies BA (Hons) SIGNED DATE 20-Jan-25
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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

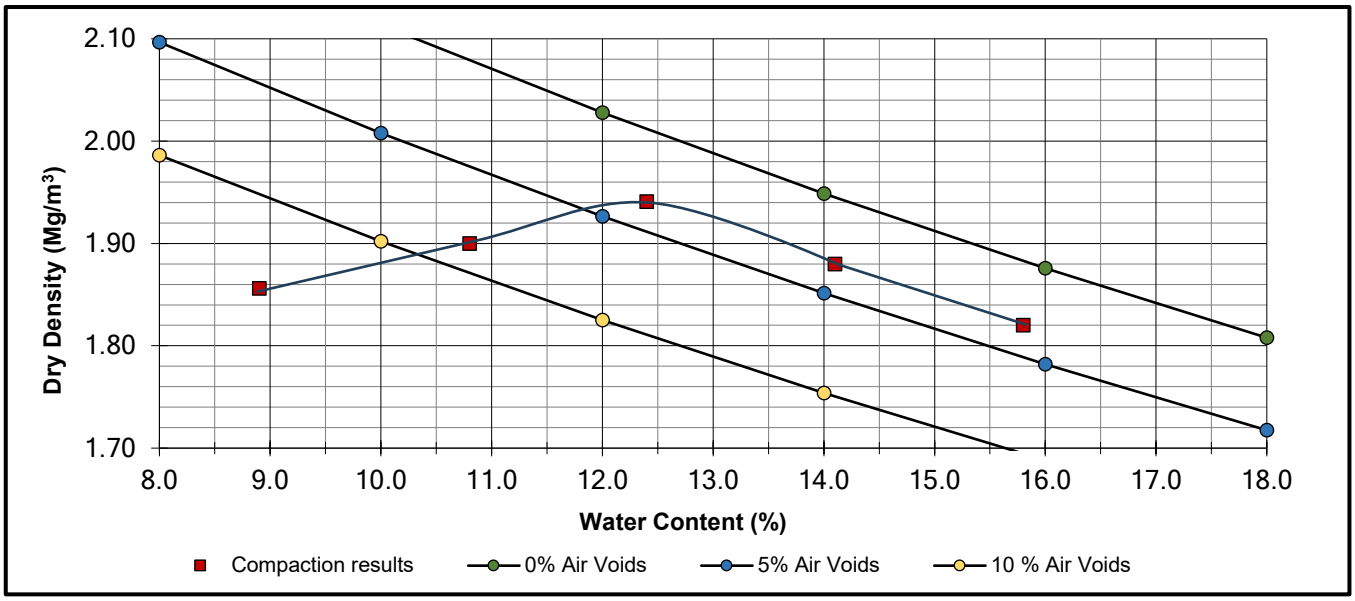
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP05 0.8 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613636	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown clayey SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	5 %	GRADING ZONE	Zone 4
RETAINED 20mm	15 %	PARTICLE DENSITY	2.68 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	8.9	1.856
2	10.8	1.900
3	12.4	1.941
4	14.1	1.880
5	15.8	1.820



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**12.00**	(Mg/m^3)

1.94

REMARKS
As received water content = 15.8%

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

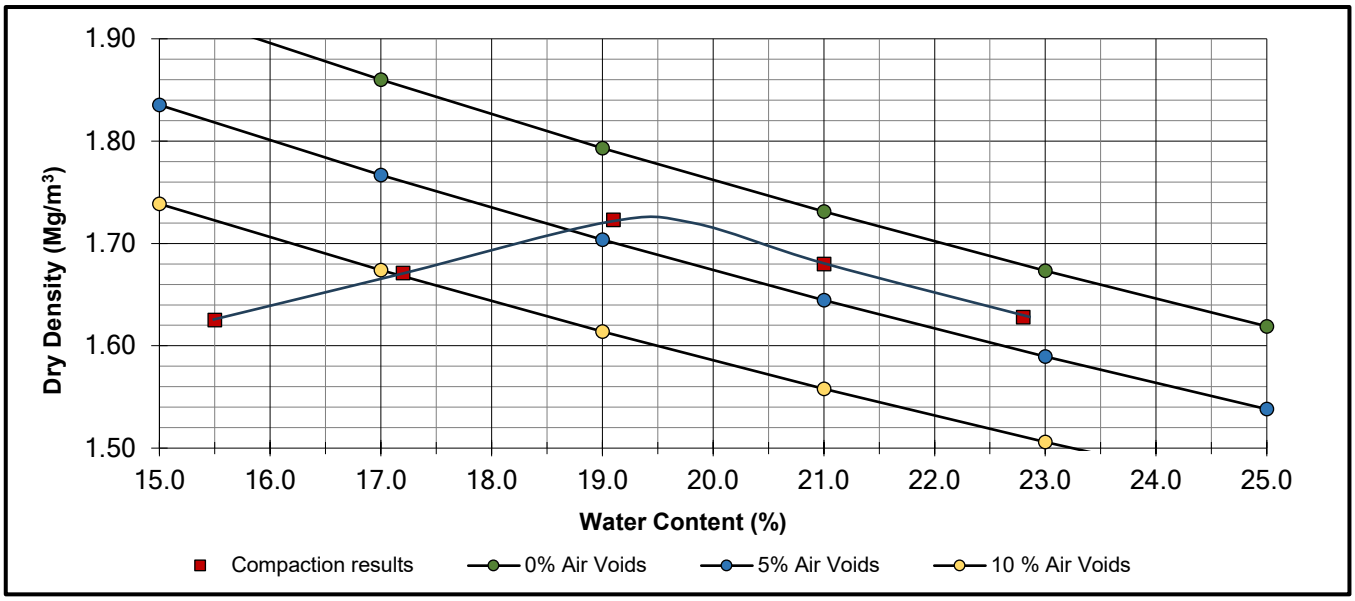
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP12 0.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613639	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 1
RETAINED 20mm	0 %	PARTICLE DENSITY	2.72 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	15.5	1.625
2	17.2	1.671
3	19.1	1.723
4	21.0	1.680
5	22.8	1.628



OPTIMUM WATER CONTENT	**19**	(%)
MAXIMUM DRY DENSITY	**1.72**	(Mg/m^3)

REMARKS
As received water content = 25.3%

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

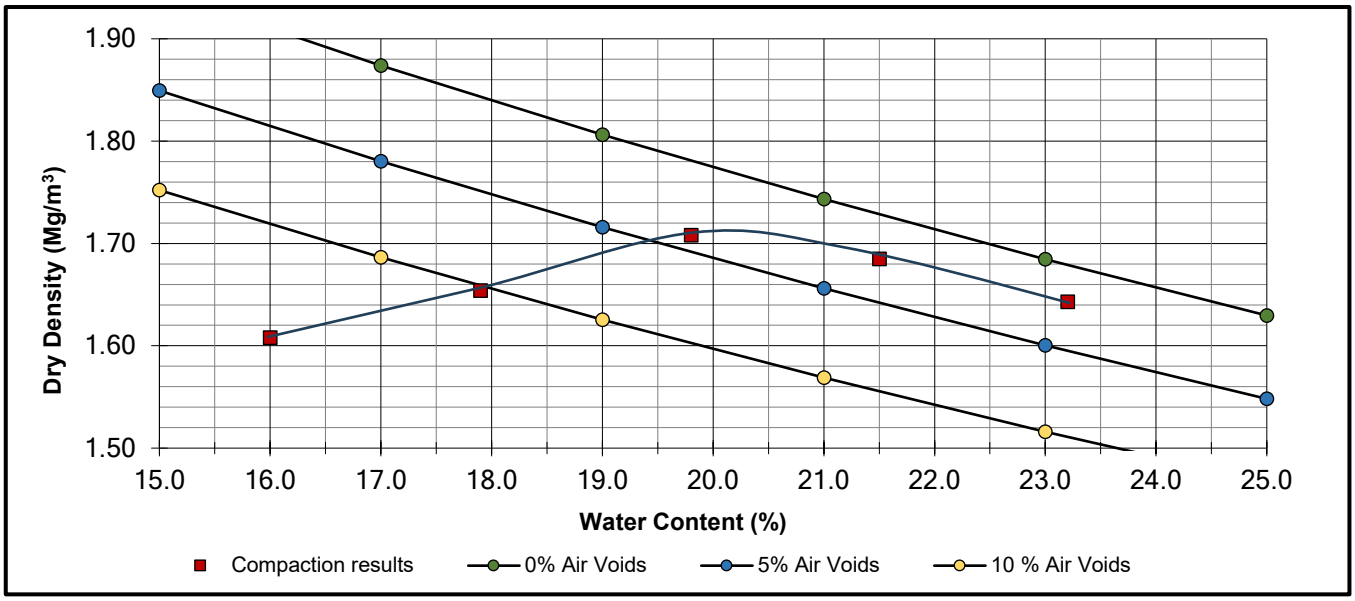
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP15 0.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613641	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slighty sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 1
RETAINED 20mm	0 %	PARTICLE DENSITY	2.75 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	16.0	1.608
2	17.9	1.654
3	19.8	1.708
4	21.5	1.685
5	23.2	1.643



OPTIMUM WATER CONTENT	**20**	(%)
MAXIMUM DRY DENSITY	**1.71**	(Mg/m^3)

REMARKS
As received water content = 21.8%

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

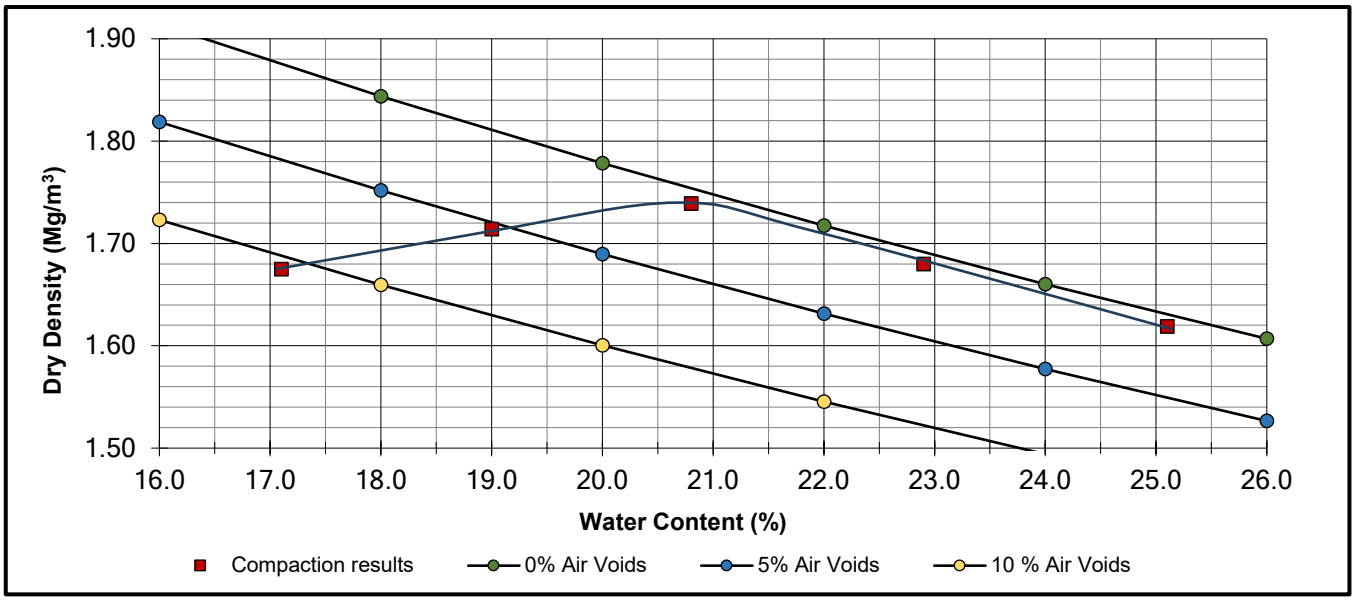
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP16 1 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613643	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown silty slighty sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	1 %	PARTICLE DENSITY	2.76 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	17.1	1.675
2	19.0	1.714
3	20.8	1.739
4	22.9	1.680
5	25.1	1.619



OPTIMUM WATER CONTENT	**21**	(%)
MAXIMUM DRY DENSITY	**1.74**	(Mg/m^3)

REMARKS
As received water content = 22.4%

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DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

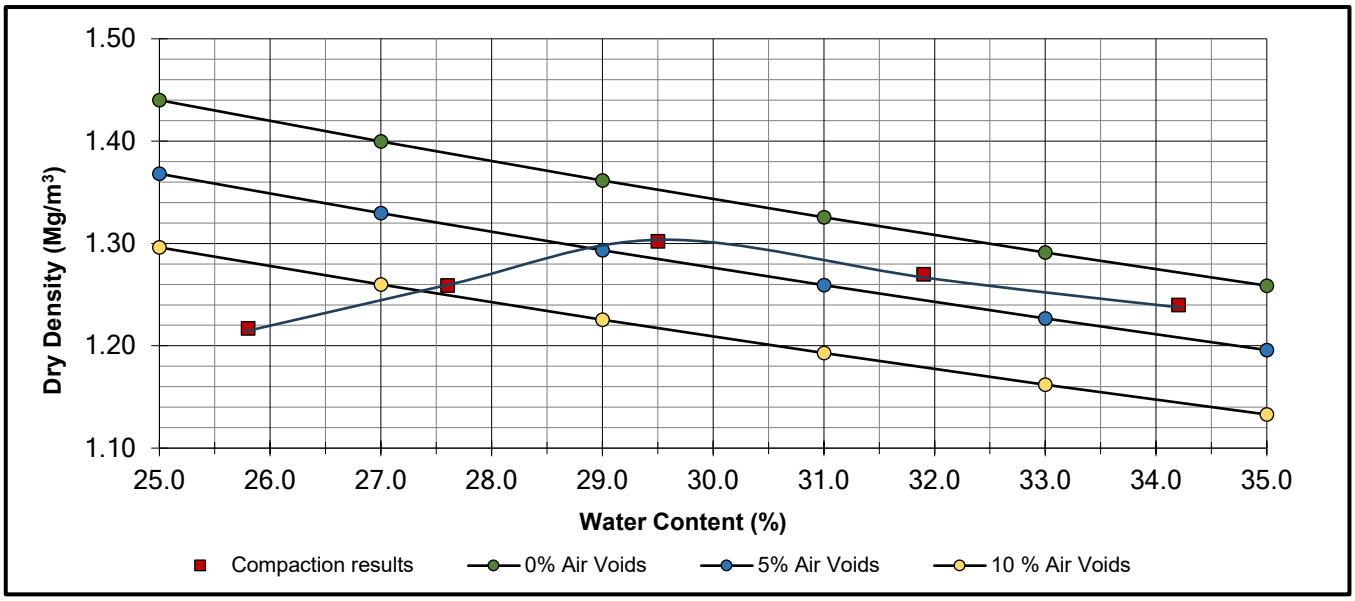
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP18 0.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613644	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Blackish brown silty sandy slightly gravelly ORGANIC MATTER
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	2 %	GRADING ZONE	Zone 4
RETAINED 20mm	2 %	PARTICLE DENSITY	2.25 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	25.8	1.217
2	27.6	1.259
3	29.5	1.302
4	31.9	1.270
5	34.2	1.240



OPTIMUM WATER CONTENT	**30**	(%)
MAXIMUM DRY DENSITY	**1.30**	(Mg/m^3)

REMARKS
As received water content = 58.1%

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DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

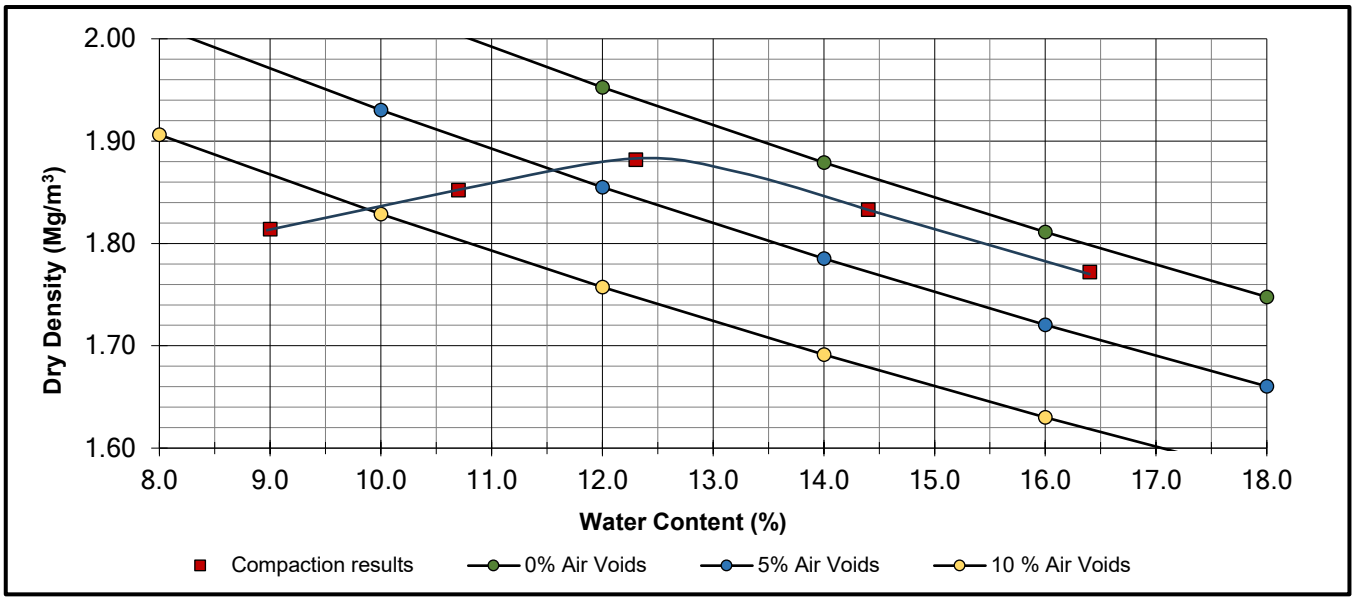
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP18 1.5 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613645	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown clayey SAND & GRAVEL
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	0 %	GRADING ZONE	Zone 2
RETAINED 20mm	4 %	PARTICLE DENSITY	2.55 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	9.0	1.814
2	10.7	1.852
3	12.3	1.882
4	14.4	1.833
5	16.4	1.772



OPTIMUM WATER CONTENT	**12**	(%)
MAXIMUM DRY DENSITY	**1.88**	(Mg/m^3)

REMARKS
As received water content = 16.4%

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TEST CERTIFICATE

DRY DENSITY/WATER CONTENT RELATIONSHIP 2.5kg RAMMER
BS 1377-2:2022 Cl.11
PARTICLE DENSITY METHOD BS 1377-2:2022 Cl.9.2

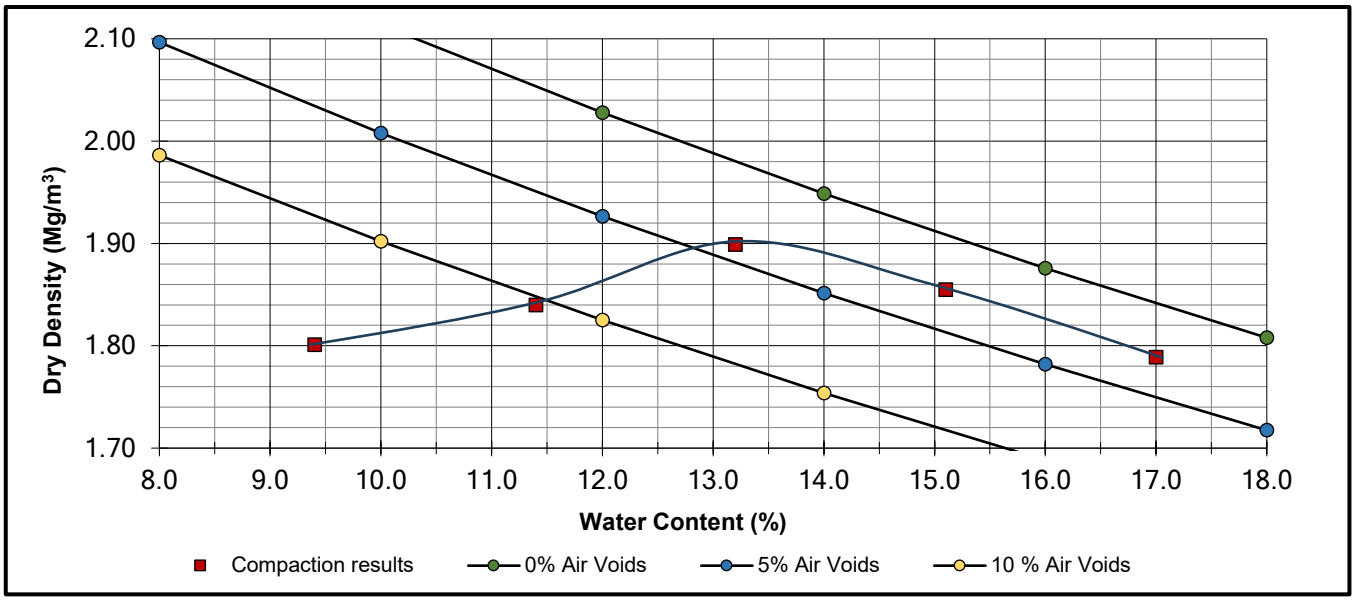
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	TP18 2.2 B	DATE SAMPLED	Not advised
SAMPLE NUMBER	613646	DATE RECEIVED	11-Dec-24
DATE TESTED	08-Jan-25	SAMPLED BY	Client

MATERIAL	Brown clay bound gravelly SAND
ADVISED SOURCE	Site Investigation Sample
PRE TREATMENT	Air Dried / Single Sample

RETAINED 37.5mm	6 %	GRADING ZONE	Zone 5
RETAINED 20mm	16 %	PARTICLE DENSITY	2.68 Mg/m3 (Measured)

POINT NUMBER	WATER CONTENT (%)	DRY DENSITY (Mg/m^3)
1	9.4	1.801
2	11.4	1.840
3	13.2	1.899
4	15.1	1.855
5	17.0	1.789



OPTIMUM WATER CONTENT	**13**	(%)
MAXIMUM DRY DENSITY	**1.90**	(Mg/m^3)

REMARKS
As received water content = 16.6%

NAME O.P. Davies BA (Hons) SIGNED DATE 20-Jan-25
(Director / Head of Laboratory)

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

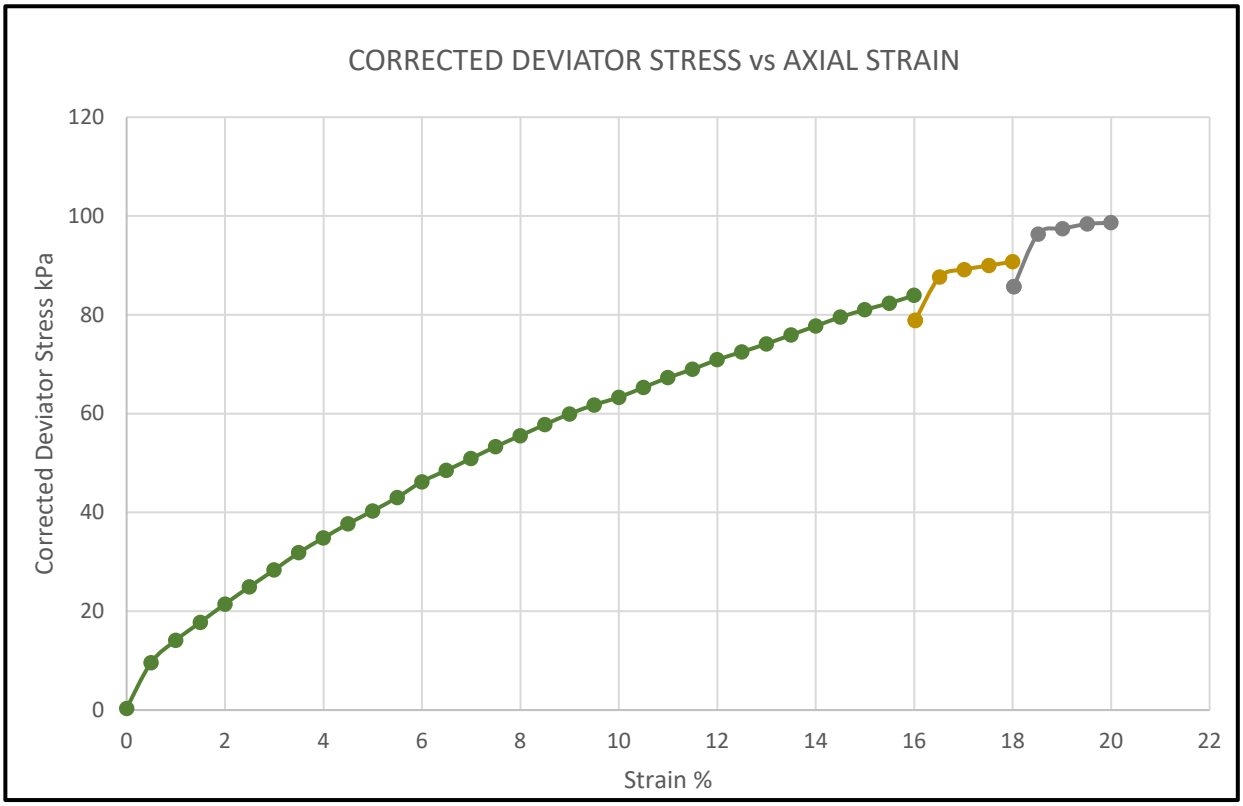
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH16 4.3-4.75 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613624	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

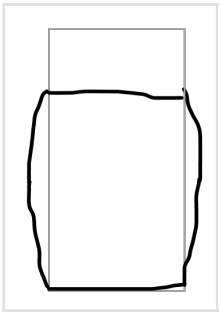
Specimen Location

Sample Length (mm)	280	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	23.6
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.20
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.78
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
45	16	2	82.4	41
90	18	2	90.0	45
180	20	2	98.4	49

Remarks/Abnormalities

Name O.P. Davies BA (Hons) (Director / Head of Laboratory) Signed Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

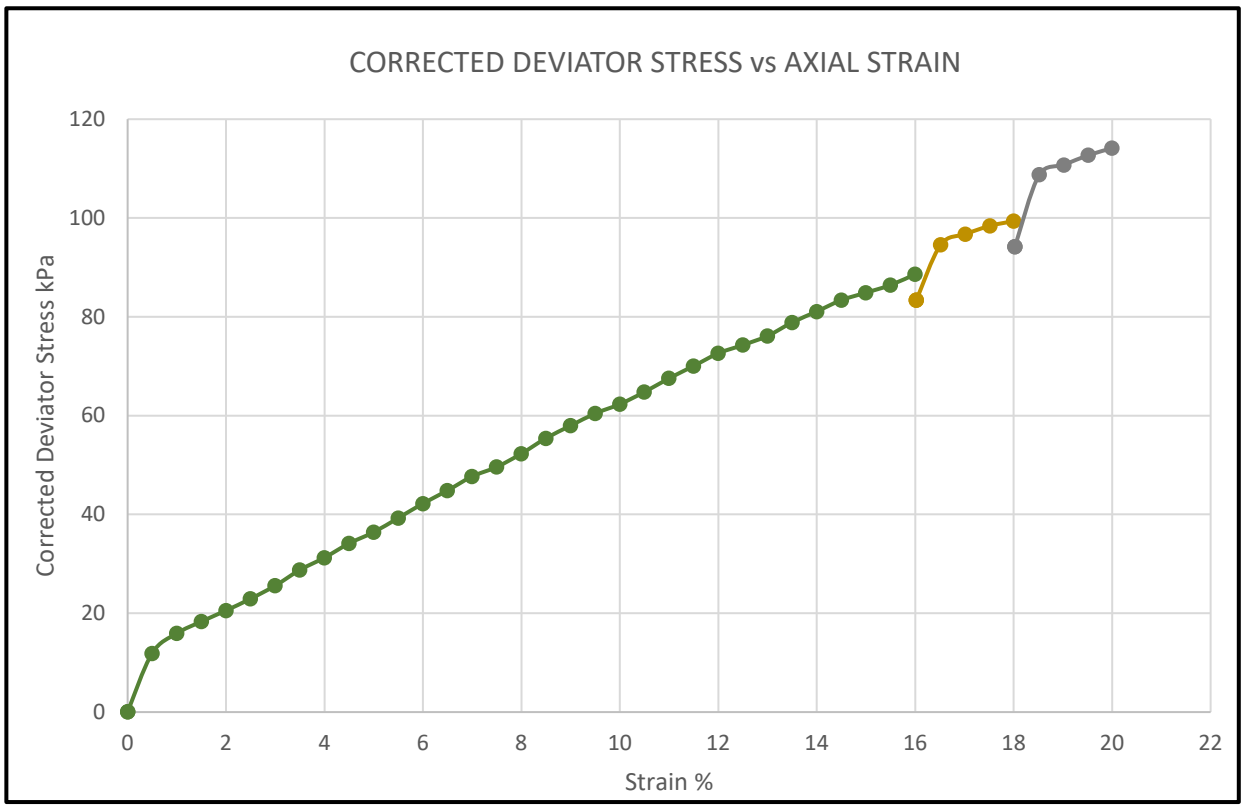
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH16 7.5-7.95 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613625	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

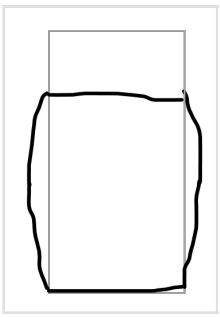
Specimen Location

Sample Length (mm)	310	Specimen depth from top of Sample (mm)		50
Sample Orientation	Vertical	Specimen Condition		Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)		18.6
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)		2.17
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)		1.83
Membrane Correction	1.28	1.39	1.51	



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
75	16	2	86.4	43
150	18	2	98.4	49
300	20	2	112.7	56

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

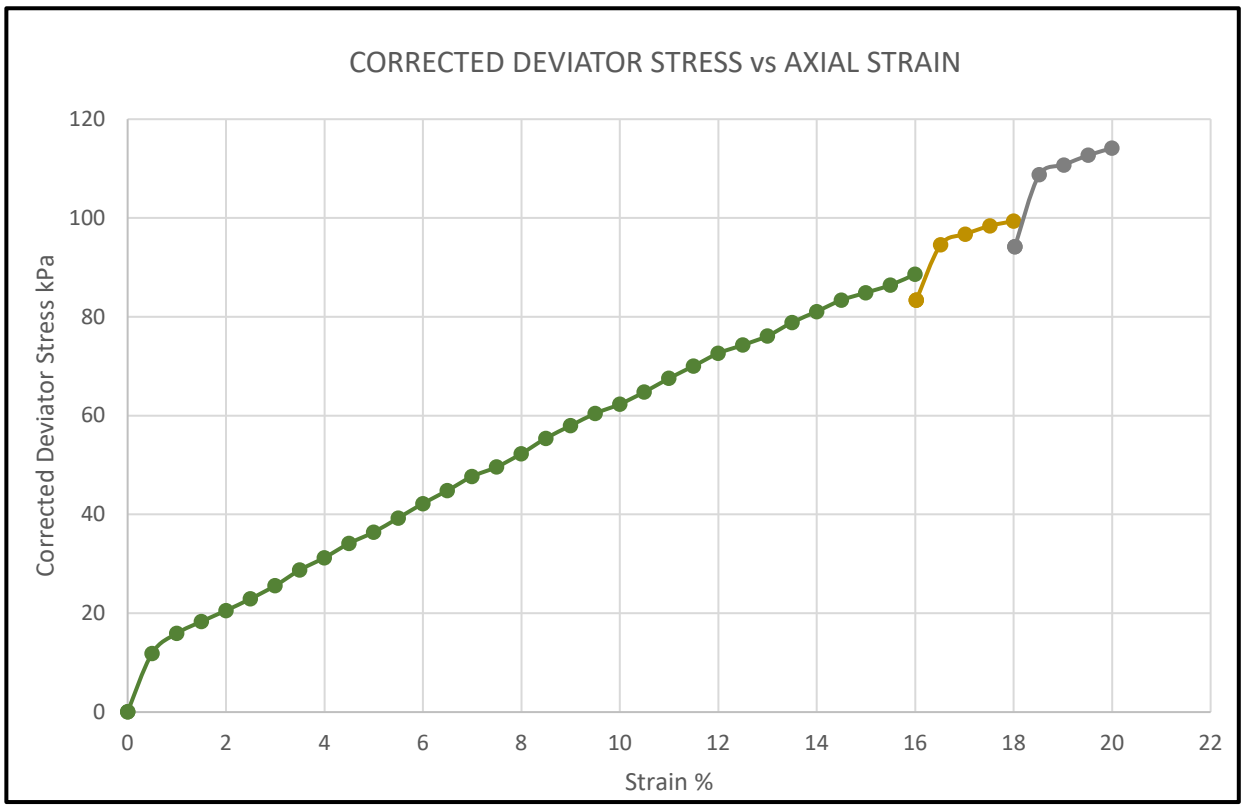
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH16 7.5-7.95 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613625	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slightly sandy CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

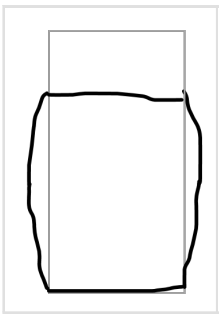
Specimen Location

Sample Length (mm)	310	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	18.6
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.17
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.83
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
75	16	2	86.4	43
150	18	2	98.4	49
300	20	2	112.7	56

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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BS 1377 : PART 7: Clause 9 Multi Stage

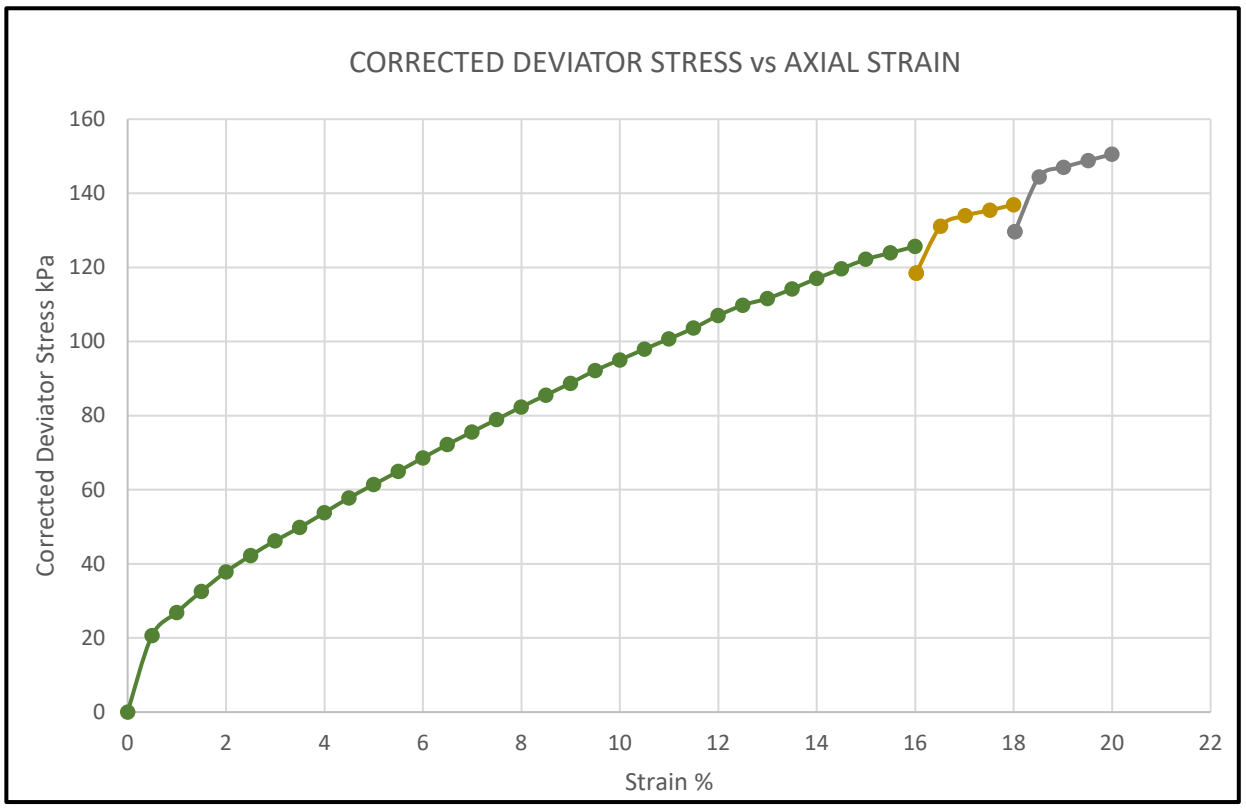
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/3

SAMPLE LABEL	BH17 6.5-6.95 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613627	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

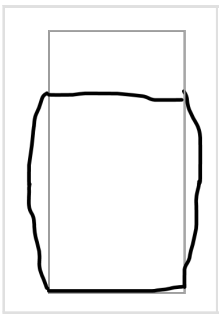
Specimen Location 

Sample Length (mm)	355	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	18.2
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.18
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.84
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
65	16	2	123.9	62
130	18	2	135.4	68
260	20	2	148.9	74

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

MURRAY RIX
CONSULTANCY, SITE INVESTIGATION
CONSTRUCTION MATERIALS TESTING

TEST REPORT

Client Tier Environmental Ltd

Address Suite 513
Chadwick House
Warrington Road
Birchwood
WA3 6AE

Contract TE1890 -
Plot 2, Marchwiel, Wrexham

Job Number MRN 25010/4
Date of Issue 20 January 2025
Pages 1 of 31

Approved Signatories

S J Hutchings, O P Davies

Notes

1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.

2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.

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

4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.

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

6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

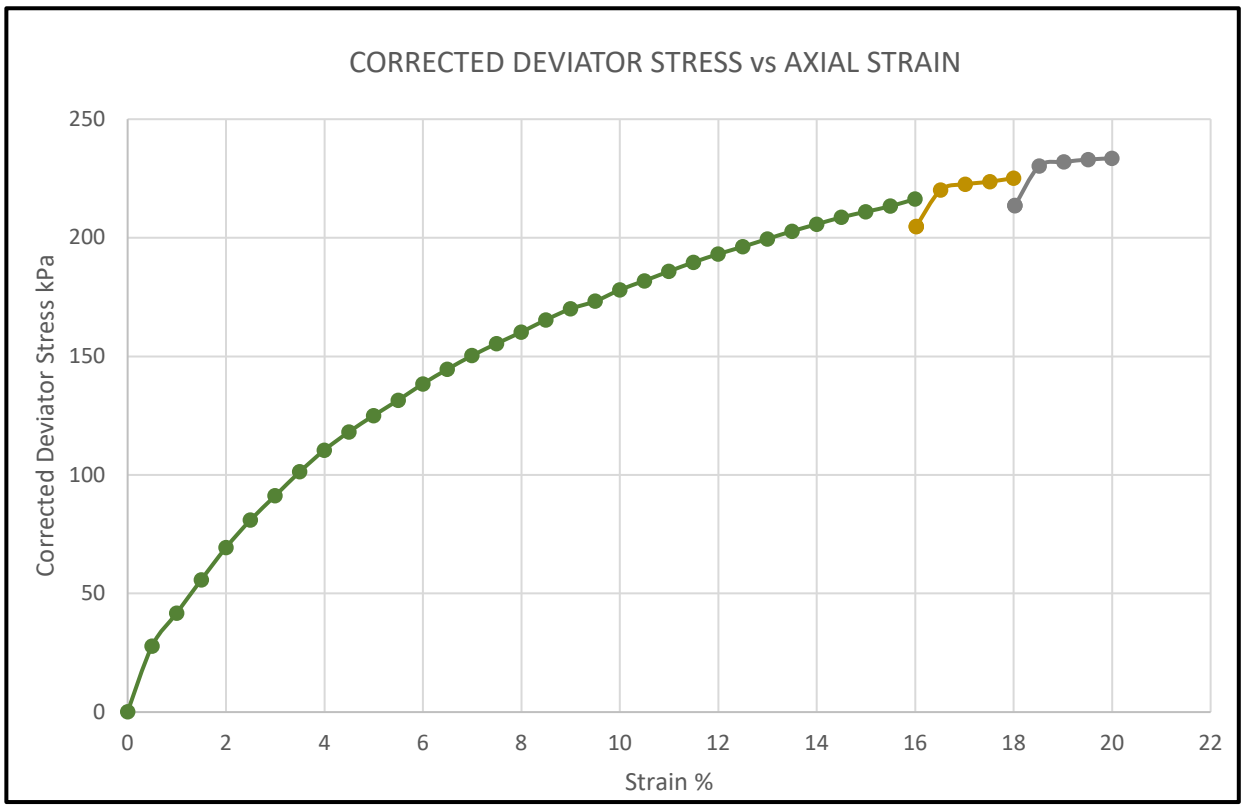
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP1 4.4-4.85 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616801	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

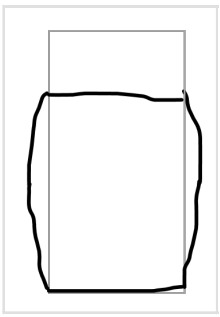
Specimen Location

Sample Length (mm)	445	Specimen depth from top of Sample (mm)		50
Sample Orientation	Vertical	Specimen Condition		Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)		20.7
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)		2.19
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)		1.81
Membrane Correction	1.28	1.39	1.51	



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
45	16	2	213.3	107
90	18	2	223.6	112
180	20	2	233.0	116

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

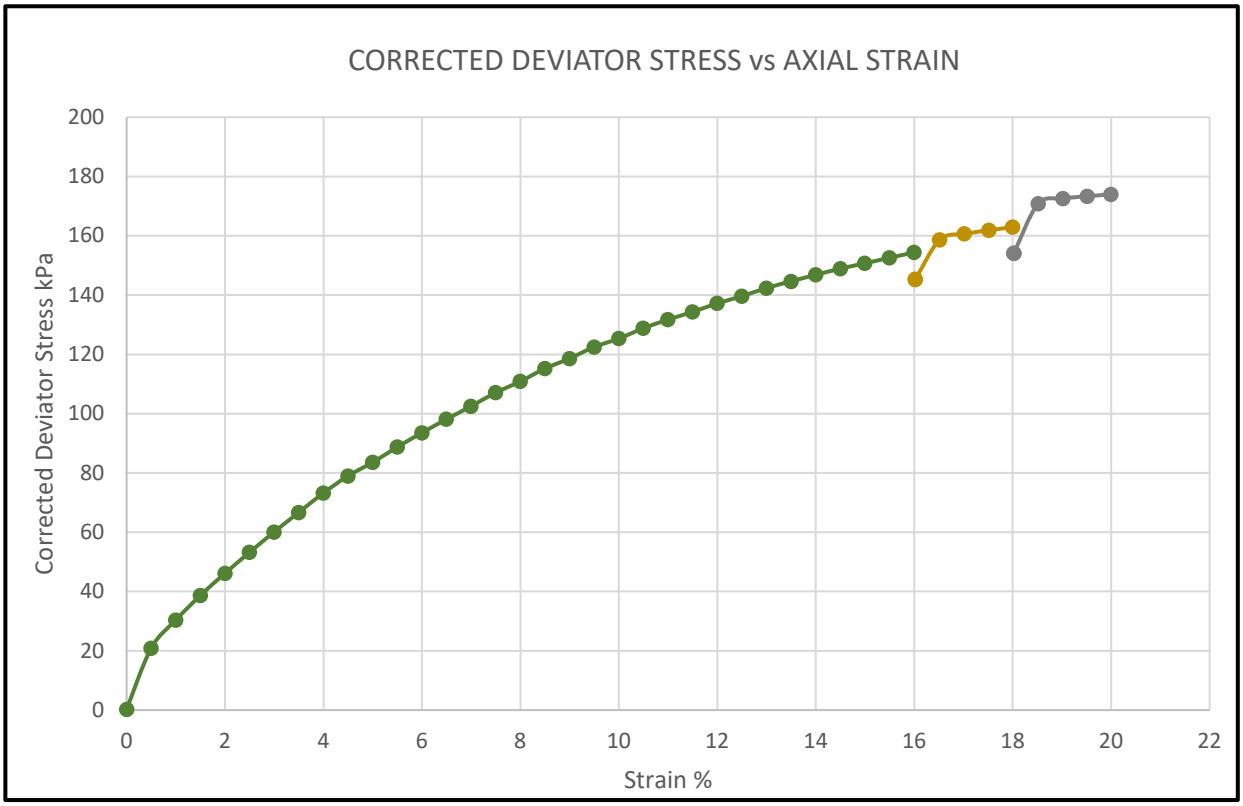
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP1 6.5-6.95 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616802	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

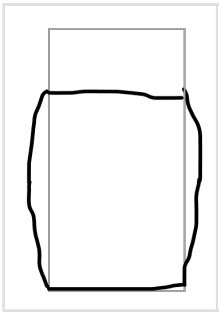
Specimen Location

Sample Length (mm)	260	Specimen depth from top of Sample (mm)		50
Sample Orientation	Vertical	Specimen Condition		Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)		19.8
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)		2.10
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)		1.75
Membrane Correction	1.28	1.39	1.51	



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
65	16	2	152.6	76
130	18	2	161.8	81
260	20	2	173.3	87

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

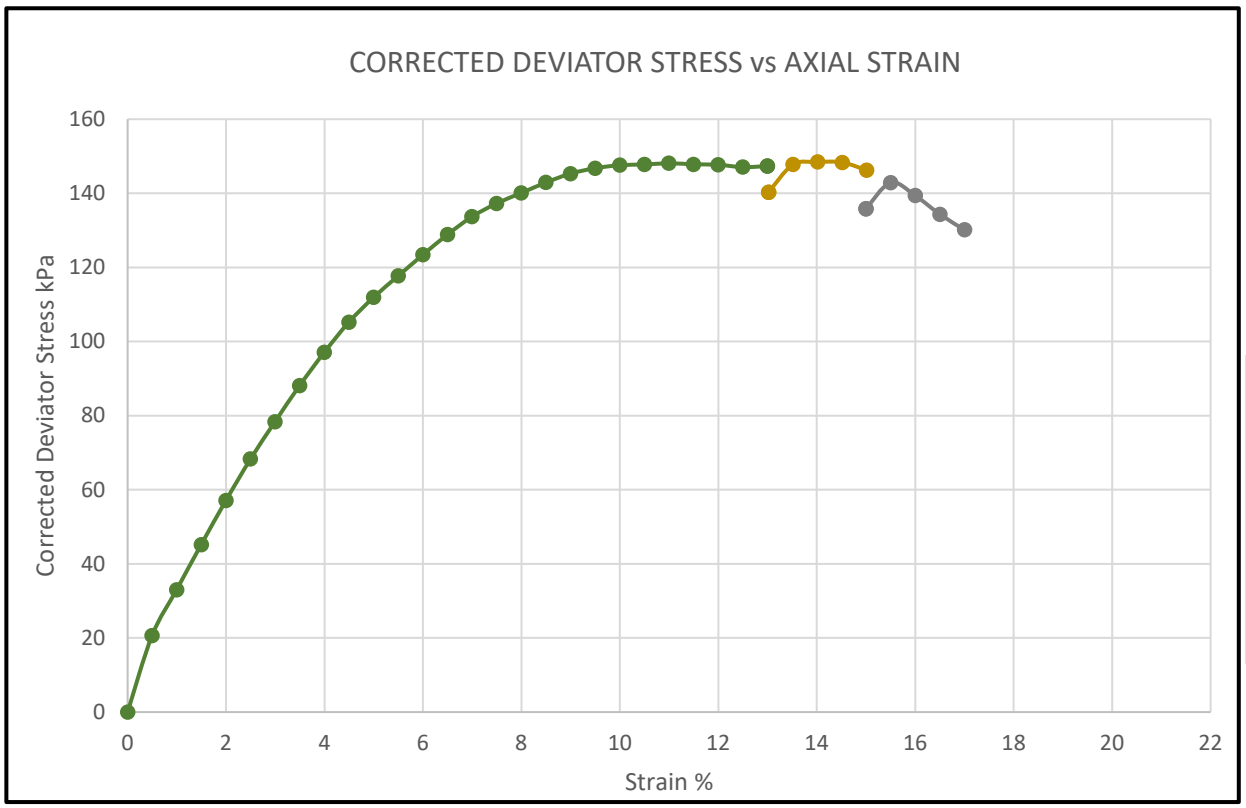
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

MPLE LABEL	BH102 3.0-3.45 U	**DATE SAMPLED**	Not advised
3 SAMPLE No.	613614	**DATE RECEIVED**	11-Dec-24
ATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

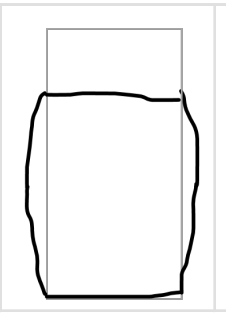
Specimen Location

Sample Length (mm)	325	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	19.7
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.12
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.77
Membrane Correction	1.10	1.28	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
30	11	2	148.1	74
60	14	2	148.4	74
120	16	2	142.9	71

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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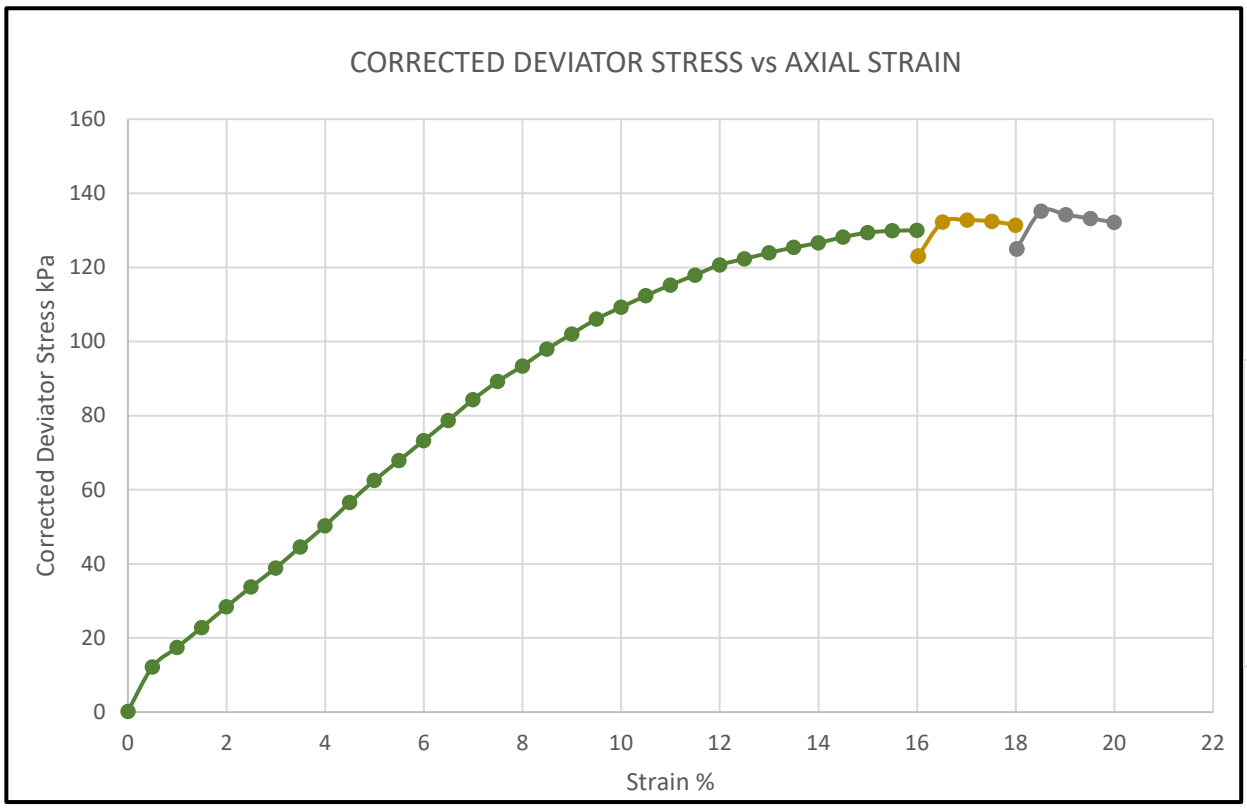
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	BH02 5.0-5.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613615	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

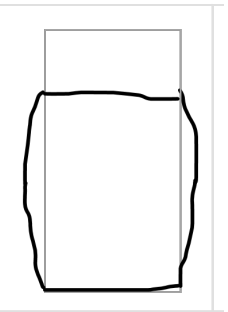
Specimen Location

Sample Length (mm)	440	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	24.7
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.09
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.68
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
50	16	2	129.9	65
100	17	2	132.7	66
200	19	2	135.2	68

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

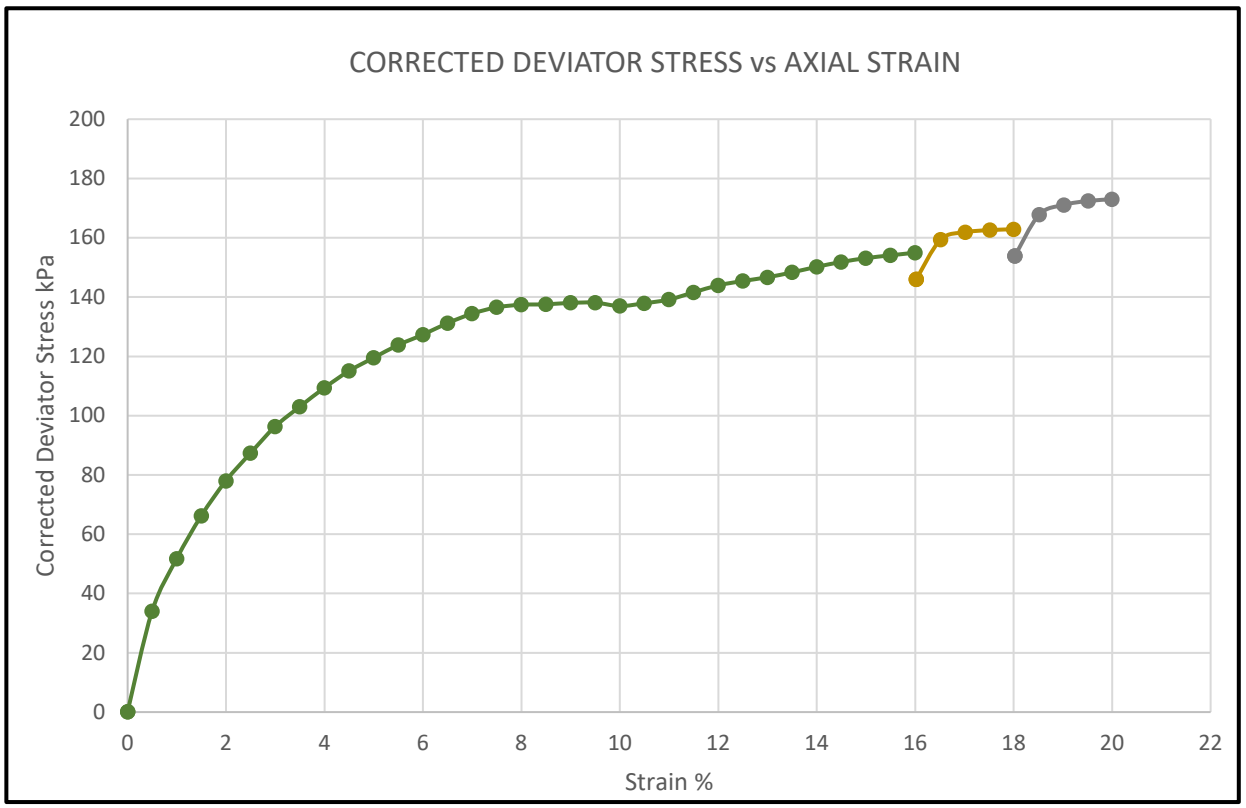
SAMPLE LABEL	BH03 2.0-2.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613616	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

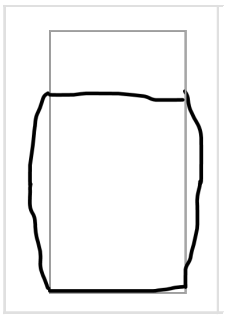


Sample Length (mm)	380	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	22.6
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	1.85
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.51
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
20	16	2	154.1	77
40	18	2	162.6	81
80	20	2	172.4	86

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

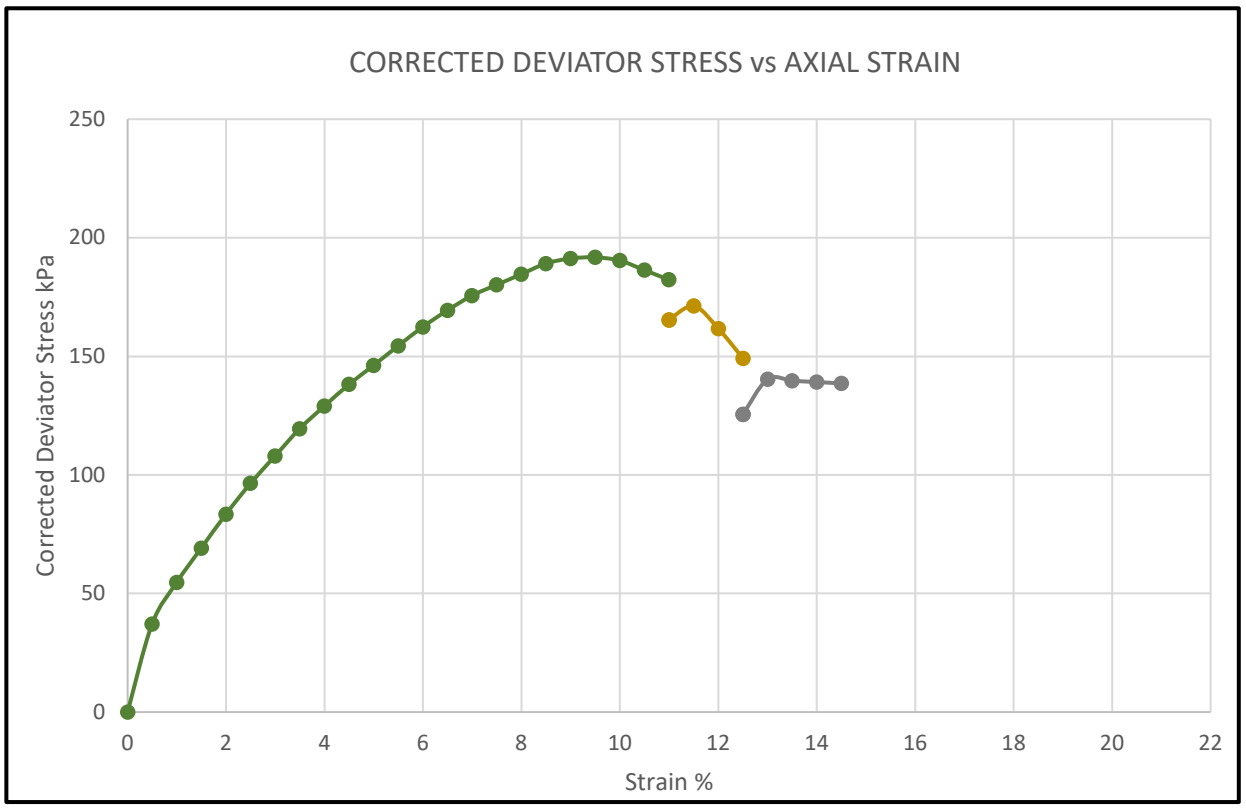
SAMPLE LABEL	BH03 5.0-5.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613617	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

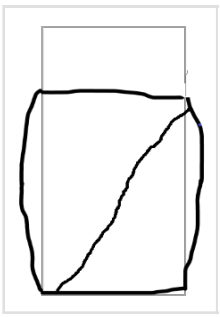


Sample Length (mm)	380	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	21.2
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.13
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.76
Membrane Correction	1.01	1.16	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
50	10	2	191.7	96
100	12	2	171.2	86
200	13	2	140.4	70

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

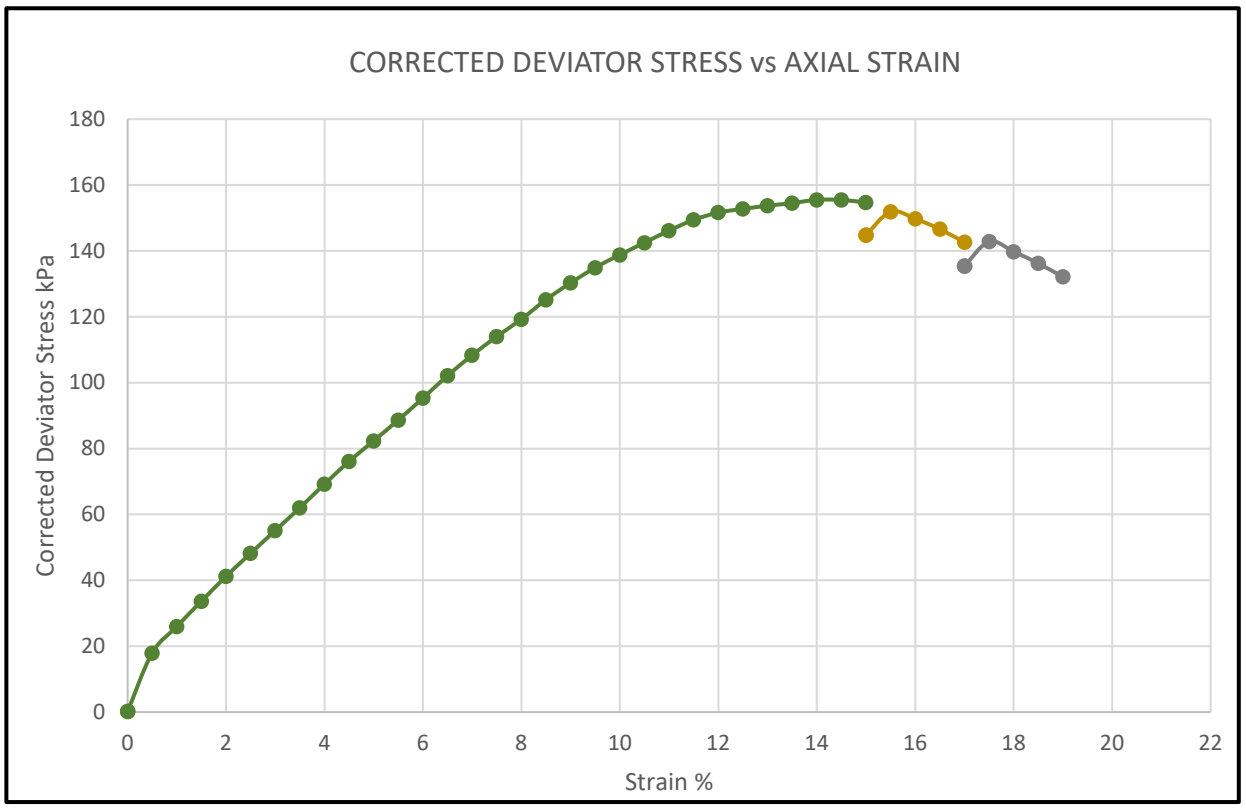
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP4 3.0-3.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616803	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

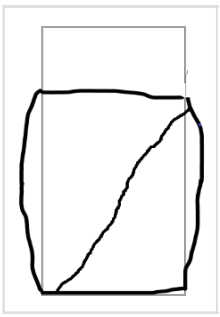
Specimen Location 

Sample Length (mm)	440	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	21.8
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.06
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.69
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
30	14	2	155.5	78
60	16	2	151.9	76
120	18	2	142.9	71

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

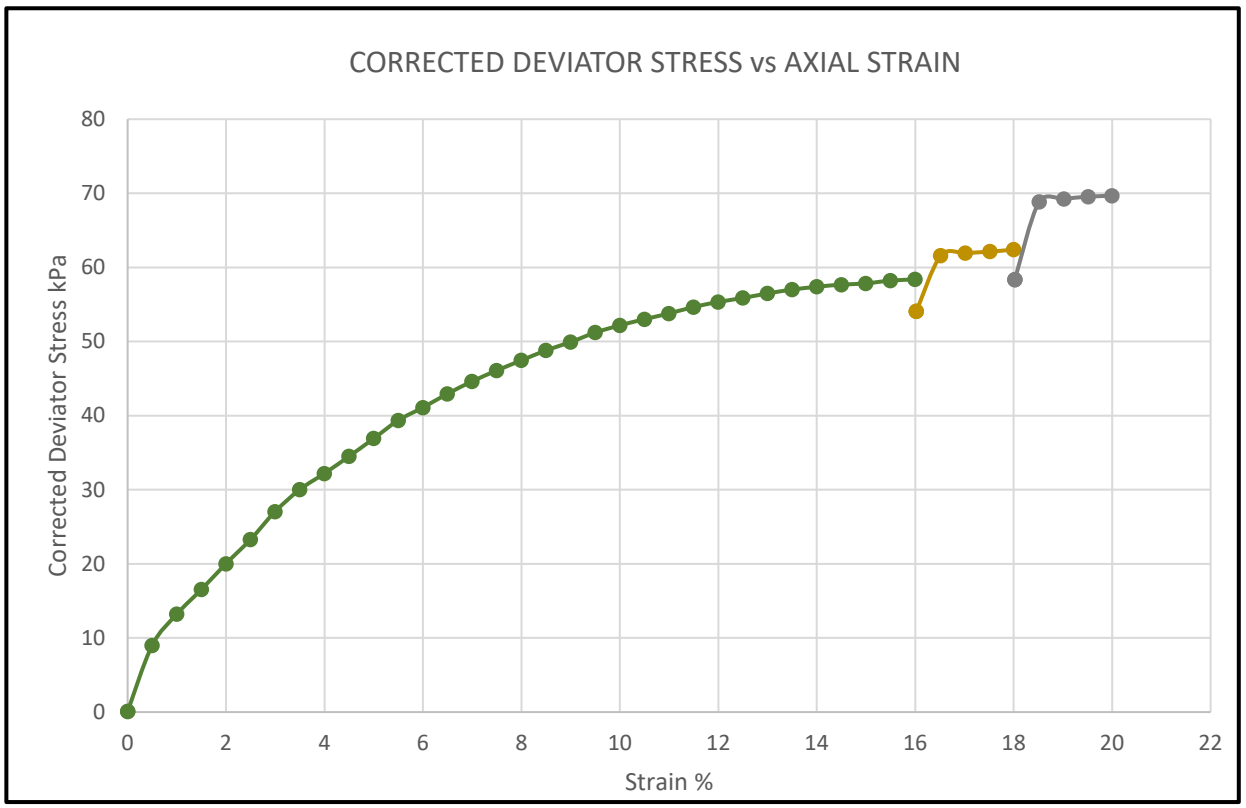
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP4 6.0-6.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616804	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

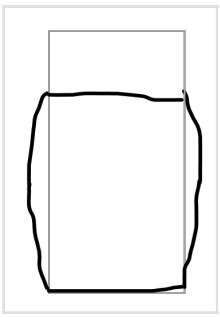
Specimen Location

Sample Length (mm)	300	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	17.6
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.19
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.86
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
60	16	2	58.2	29
120	18	2	62.1	31
240	20	2	69.6	35

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

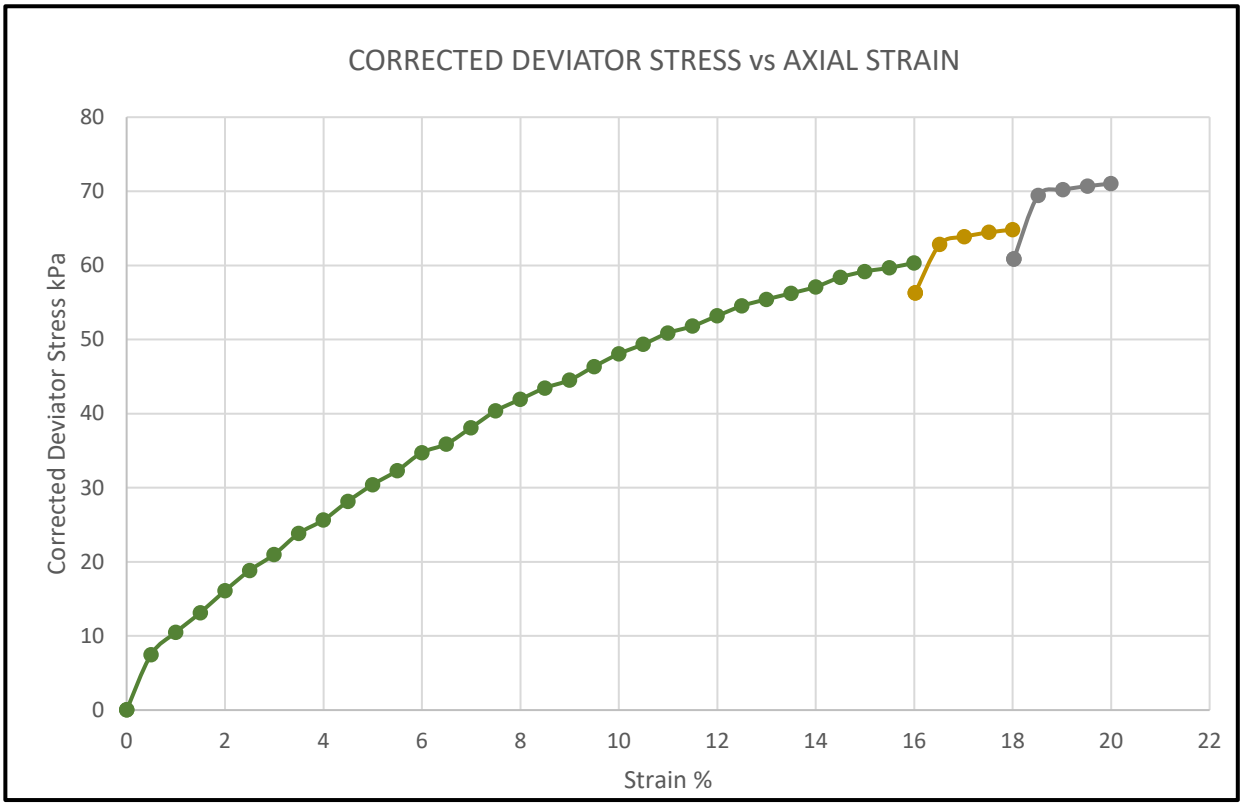
SAMPLE LABEL	CP5 4.3-4.75 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616806	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

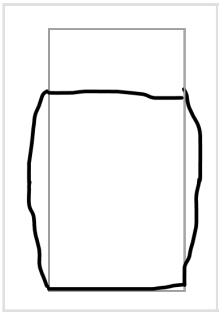


Sample Length (mm)	300	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	23.2
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.08
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.69
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
45	16	2	59.7	30
90	18	2	64.5	32
180	20	2	70.7	35

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

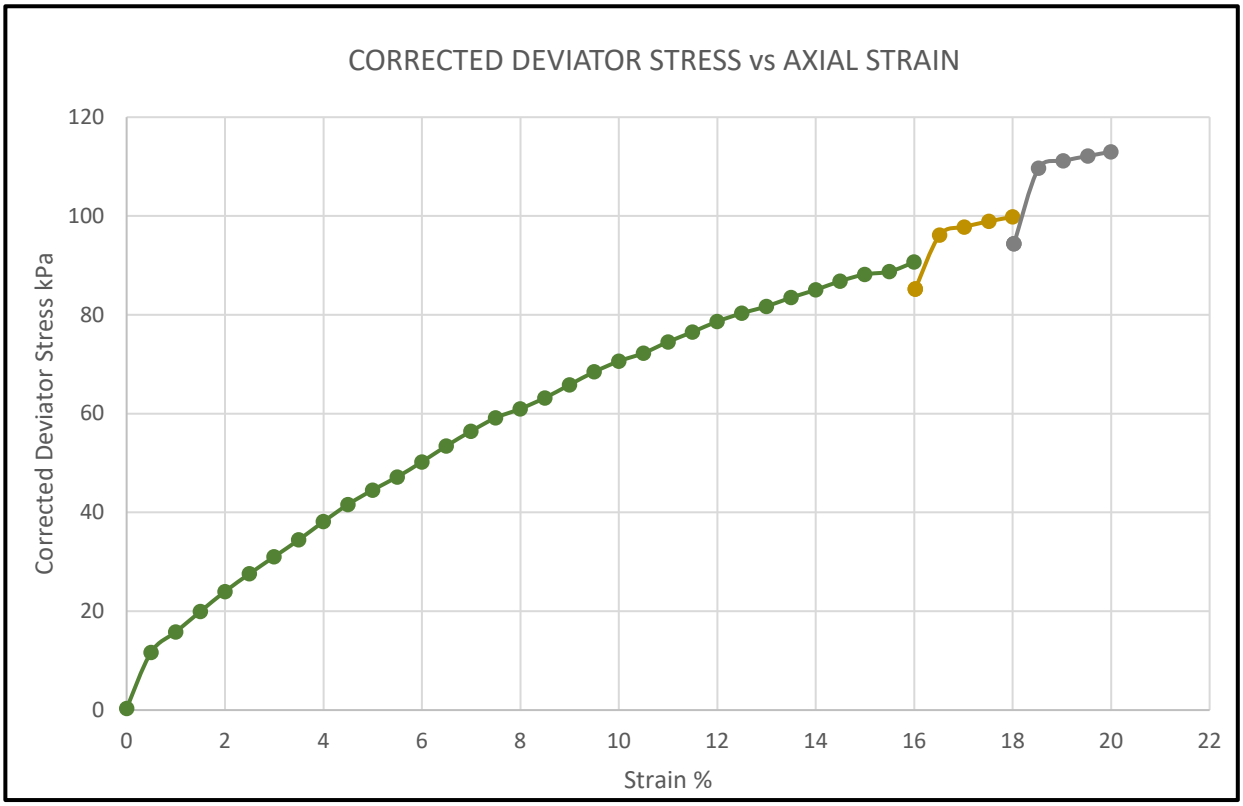
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP5 9.0-9.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616807	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

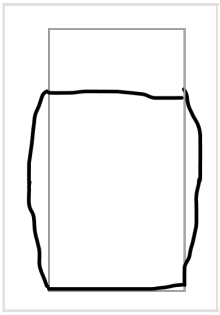
Specimen Location

Sample Length (mm)	350	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	19.5
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.15
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.80
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
90	16	2	88.7	44
180	18	2	98.9	49
360	20	2	112.1	56

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

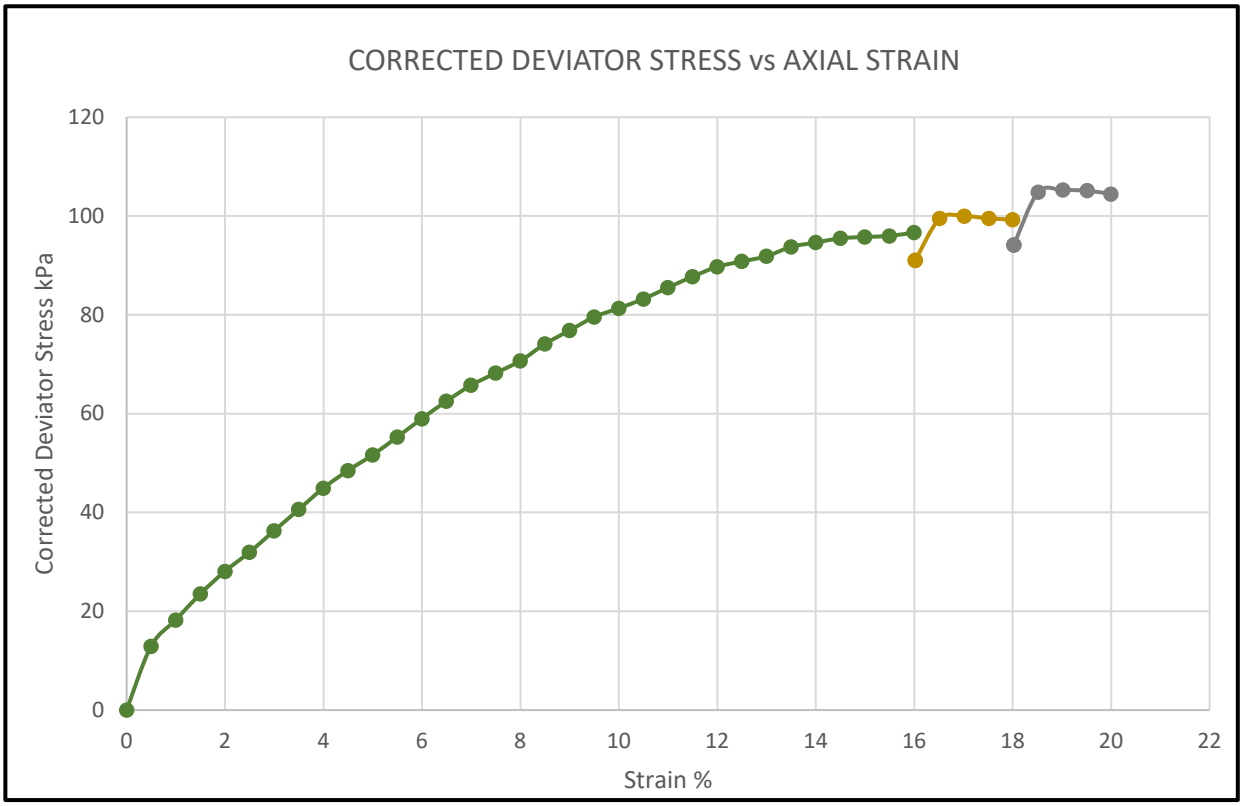
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP6 4.0-4.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616808	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

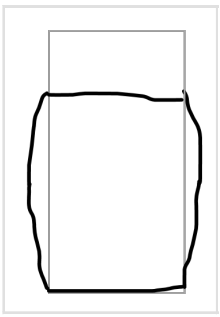
Specimen Location

Sample Length (mm)	440	Specimen depth from top of Sample (mm)		50
Sample Orientation	Vertical	Specimen Condition		Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)		22.9
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)		2.20
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)		1.79
Membrane Correction	1.28	1.39	1.51	



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
40	16	2	96.0	48
80	17	2	100.0	50
160	19	2	105.2	53

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

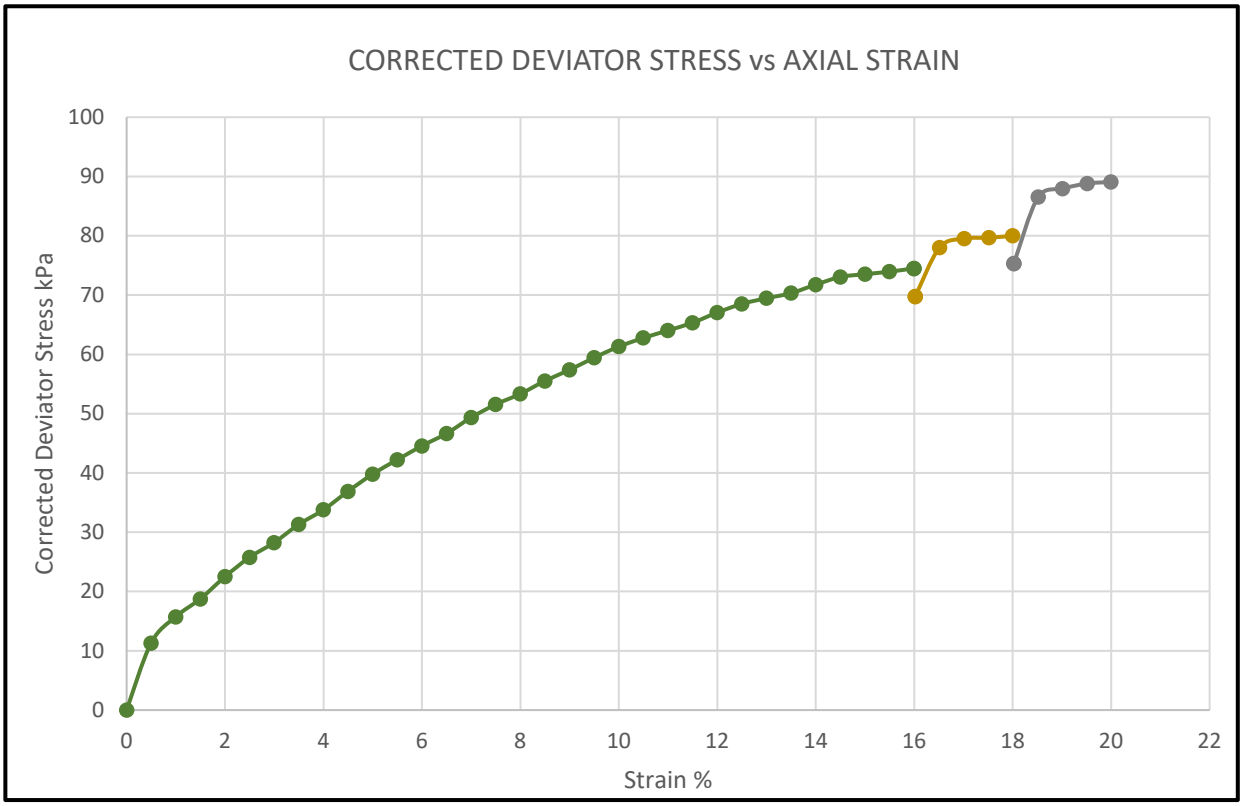
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP6 6.0-6.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616809	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

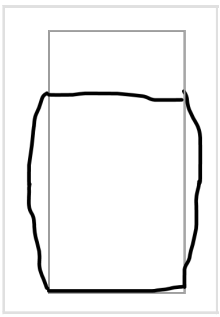
Specimen Location 

Sample Length (mm)	385	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	27.0
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.09
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.65
Membrane Correction	1.27	1.39	1.50



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
60	16	2	74.5	37
120	18	2	79.7	40
240	20	2	88.8	44

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

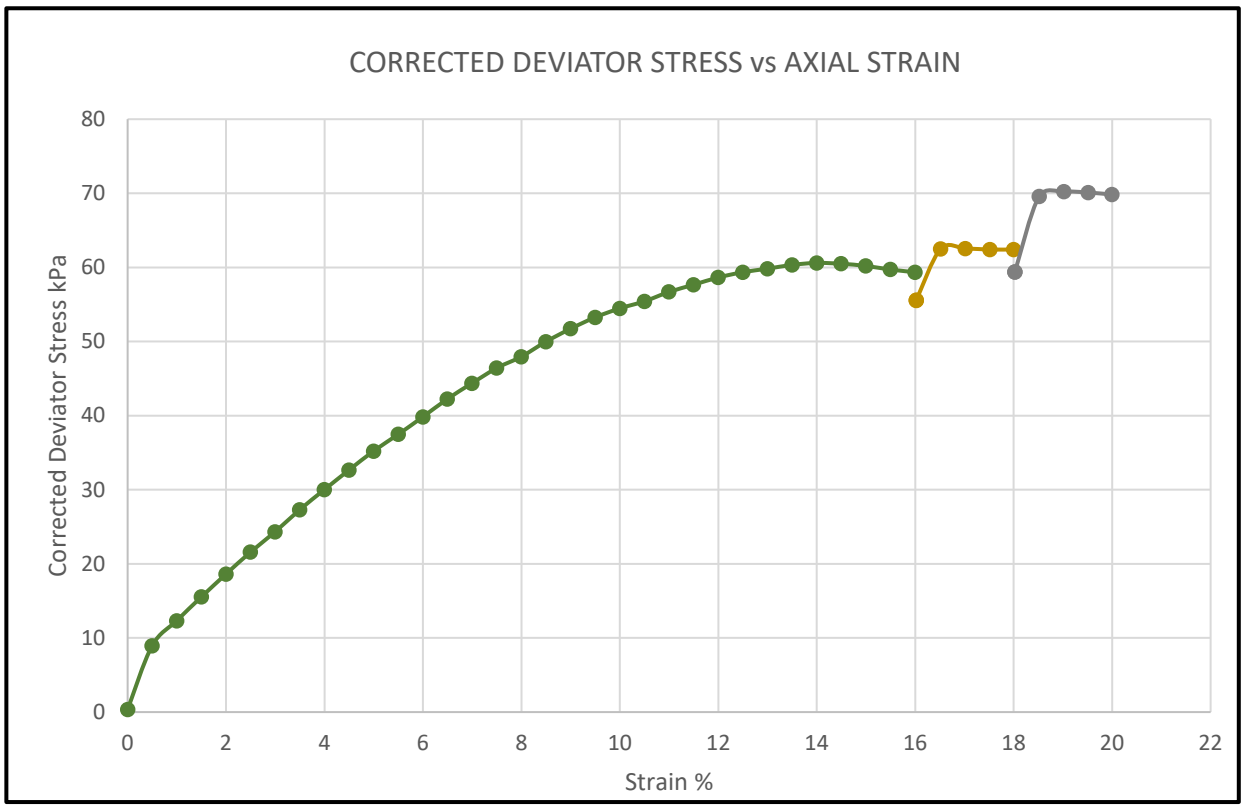
SAMPLE LABEL	CP7 6.5-6.95 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616810	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

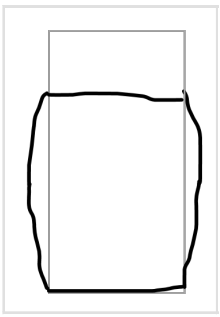


Sample Length (mm)	300	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	26.1
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	1.97
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.56
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
65	14	2	60.6	30
130	17	2	62.6	31
260	19	2	70.2	35

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

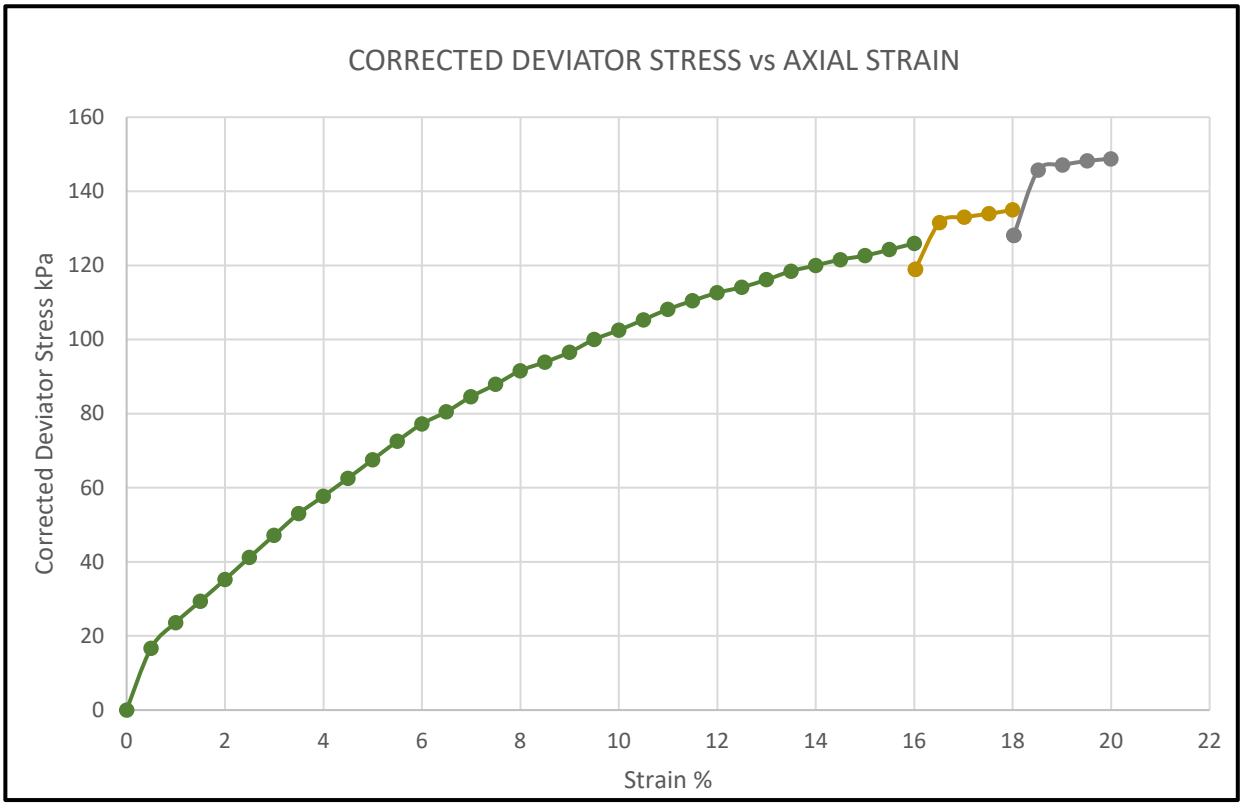
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP7 9.7-10.15 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616811	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

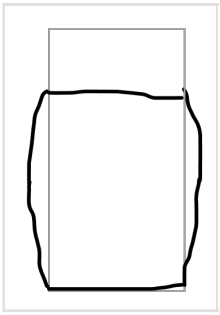
Specimen Location

Sample Length (mm)	440	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	21.5
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.15
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.77
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
100	16	2	124.3	62
200	18	2	133.9	67
400	20	2	148.2	74

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

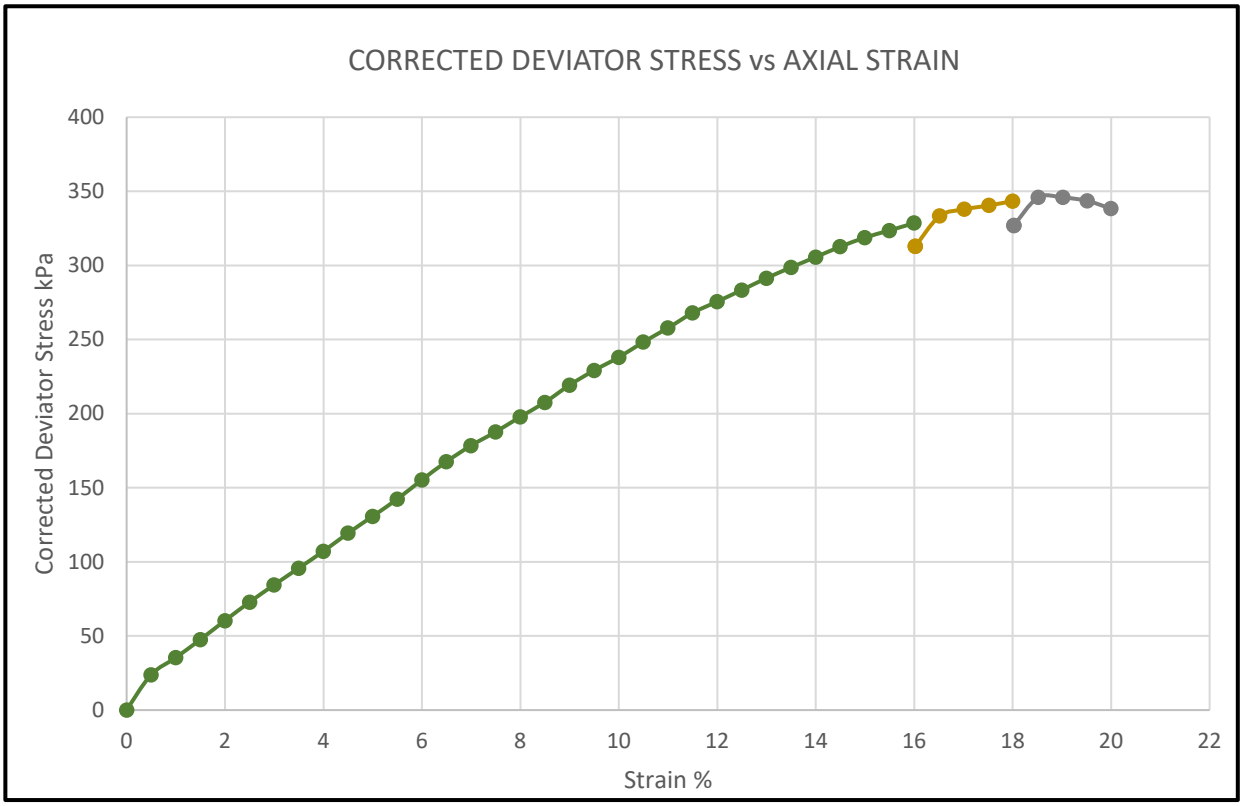
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP8 2.0-2.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616812	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

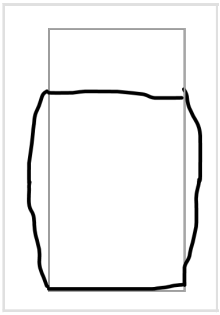
Specimen Location

Sample Length (mm)	390	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	17.2
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.22
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.89
Membrane Correction	1.27	1.39	1.50



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
20	16	2	323.6	162
40	18	2	340.4	170
80	19	2	345.9	173

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

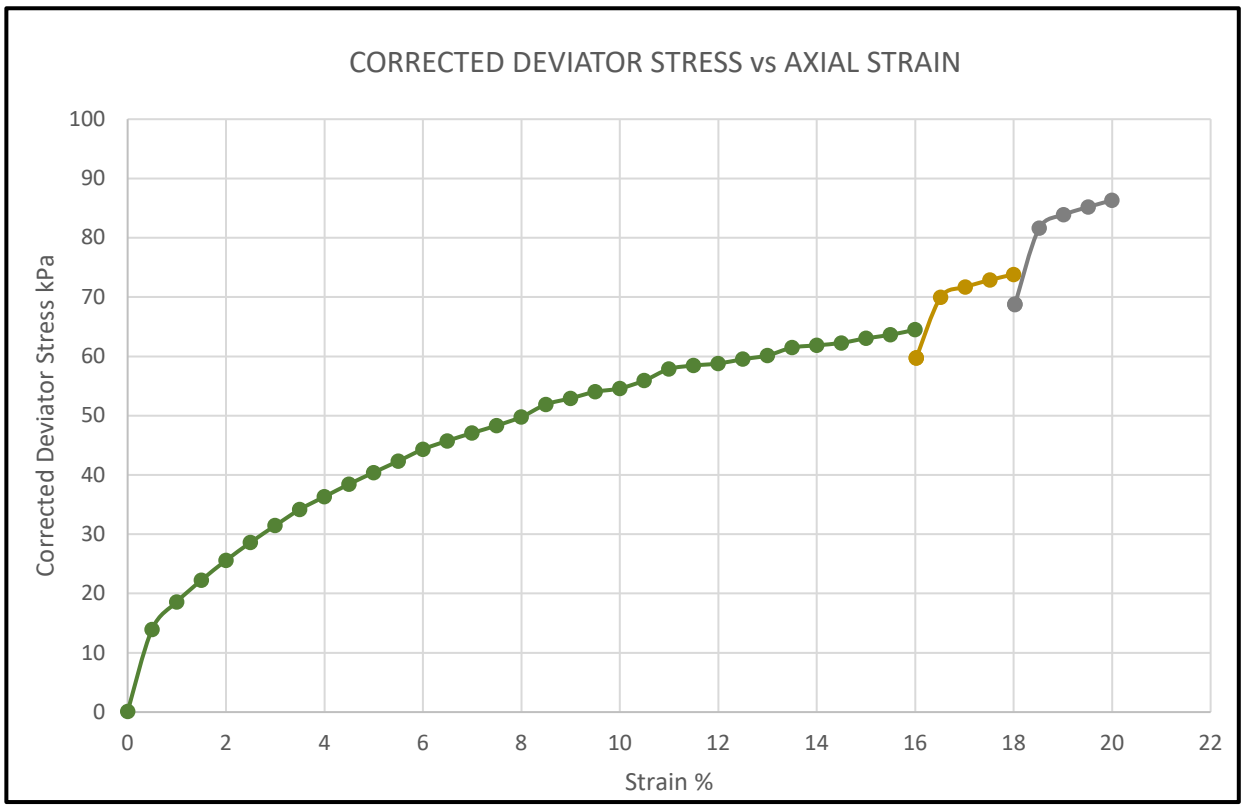
SAMPLE LABEL	CP8 5.0-5.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616813	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

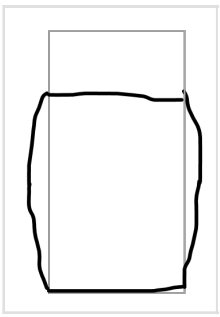


Sample Length (mm)	395	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	20.3
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.25
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.87
Membrane Correction	1.27	1.39	1.50



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
50	16	2	63.6	32
100	18	2	72.9	36
200	20	2	85.2	43

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

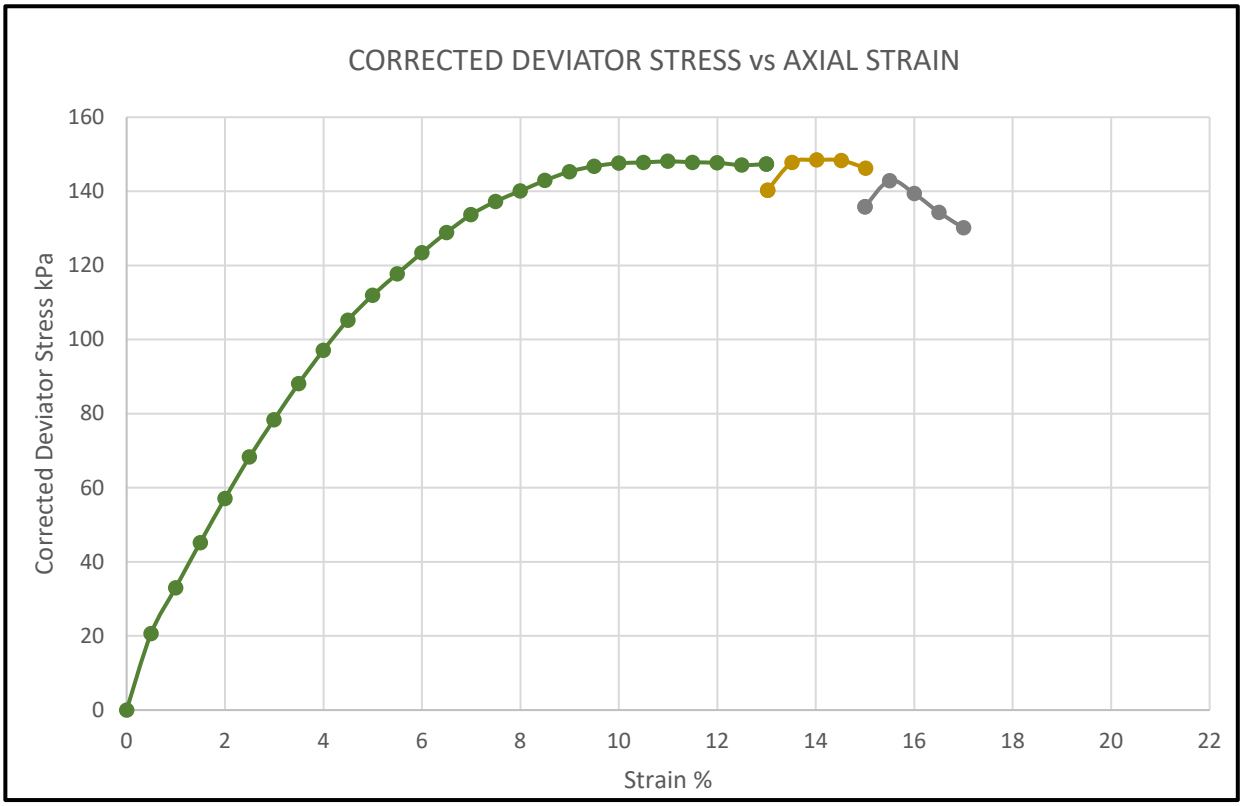
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP9 1.2-1.65 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616814	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

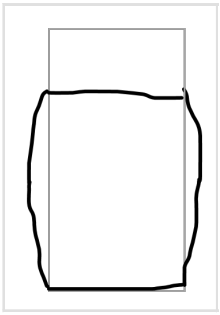
Specimen Location

Sample Length (mm)	395	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	20.3
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.12
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.76
Membrane Correction	1.10	1.28	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
15	11	2	148.1	74
30	14	2	148.4	74
60	16	2	142.9	71

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

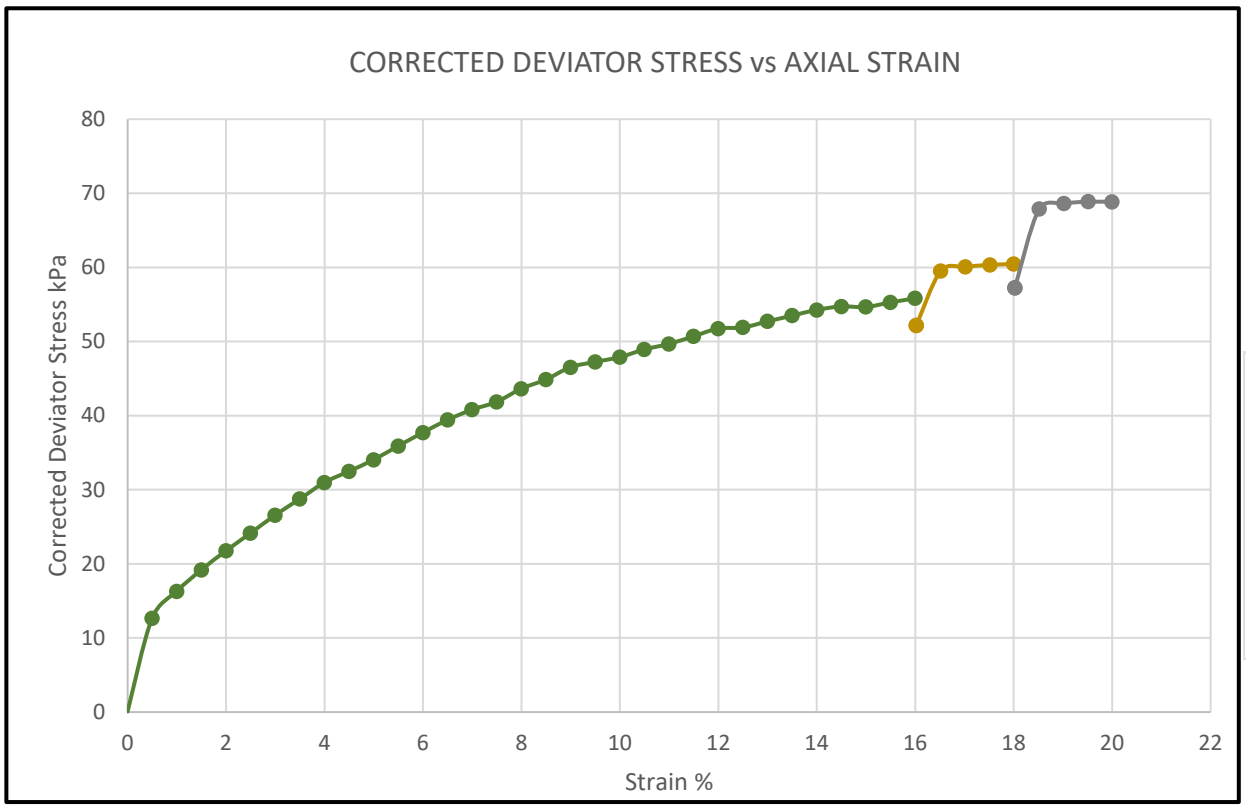
SAMPLE LABEL	CP9 6.7-7.15 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616815	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

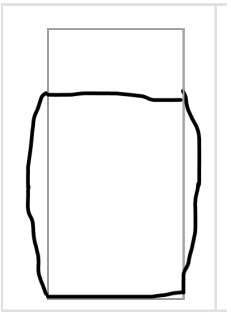


Sample Length (mm)	275	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	199	Specimen Moisture Content (%)	22.9
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.12
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.72
Membrane Correction	1.28	1.40	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
70	16	2	55.3	28
140	18	2	60.3	30
280	20	2	68.9	34

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

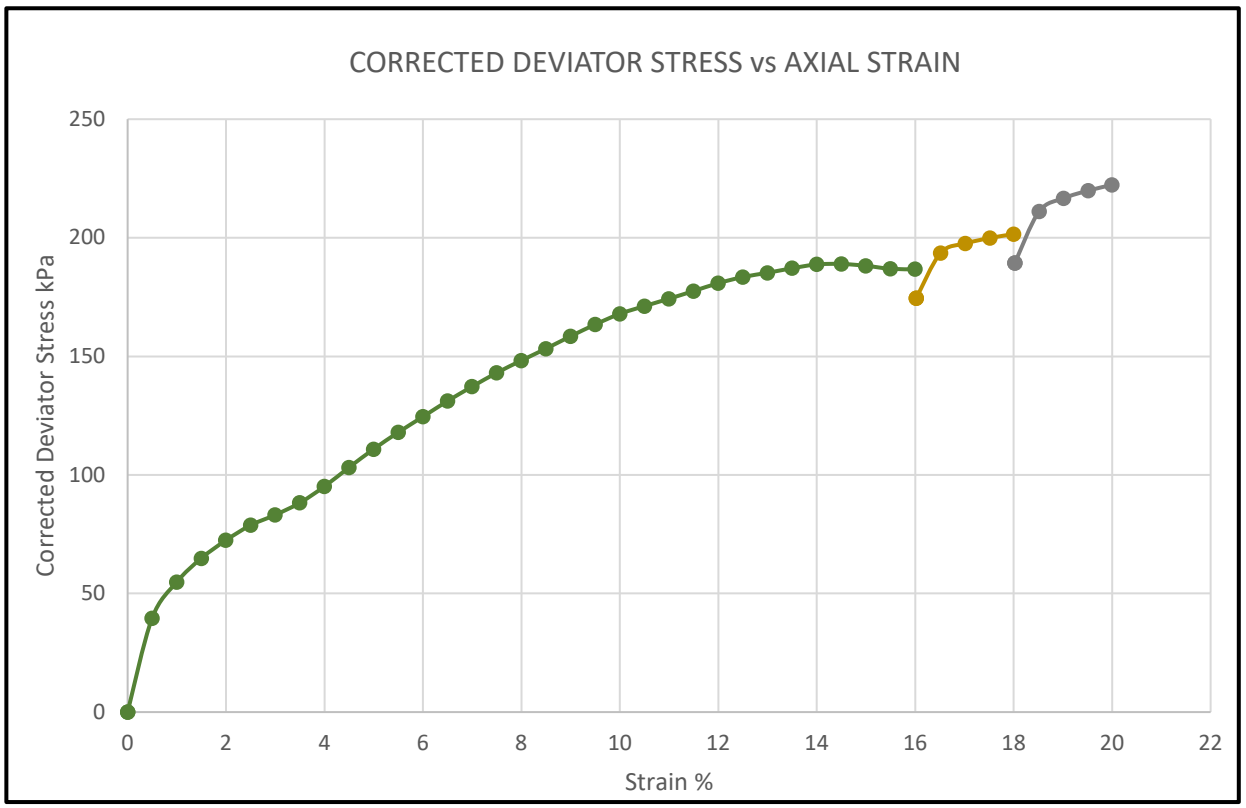
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	BH10 1.2-1.65 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613622	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

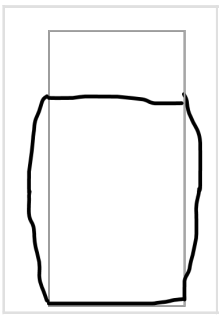
Specimen Location

Sample Length (mm)	355	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	199	Specimen Moisture Content (%)	17.8
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	1.84
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.56
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
15	15	2	189.0	94
30	18	2	199.9	100
60	20	2	219.9	110

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

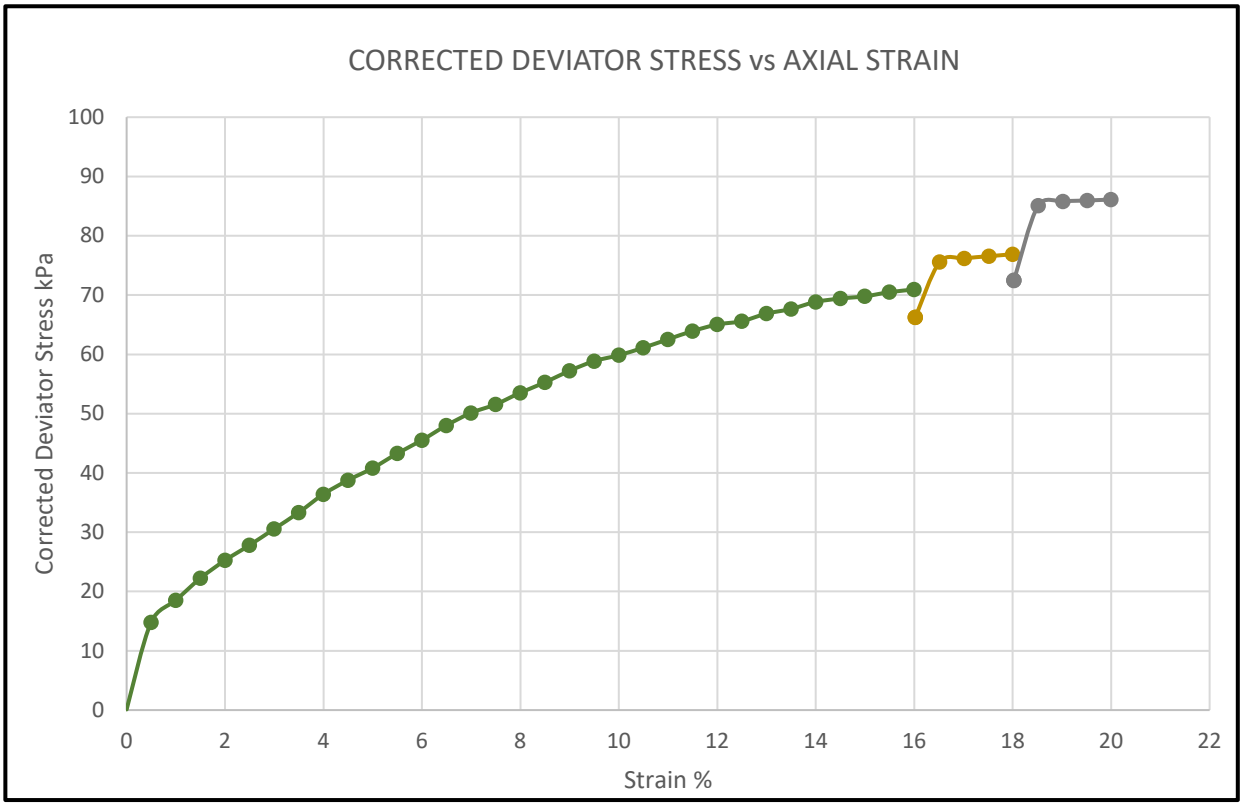
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	BH10 8.6-9.05 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613623	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

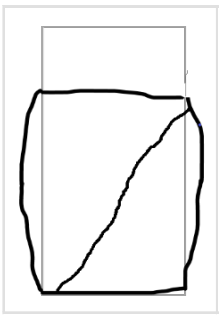
Specimen Location

Sample Length (mm)	380	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	22.6
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.07
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.69
Membrane Correction	1.27	1.39	1.50



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



COMBINED

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
90	16	2	70.5	35
180	18	2	76.6	38
360	20	2	86.0	43

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

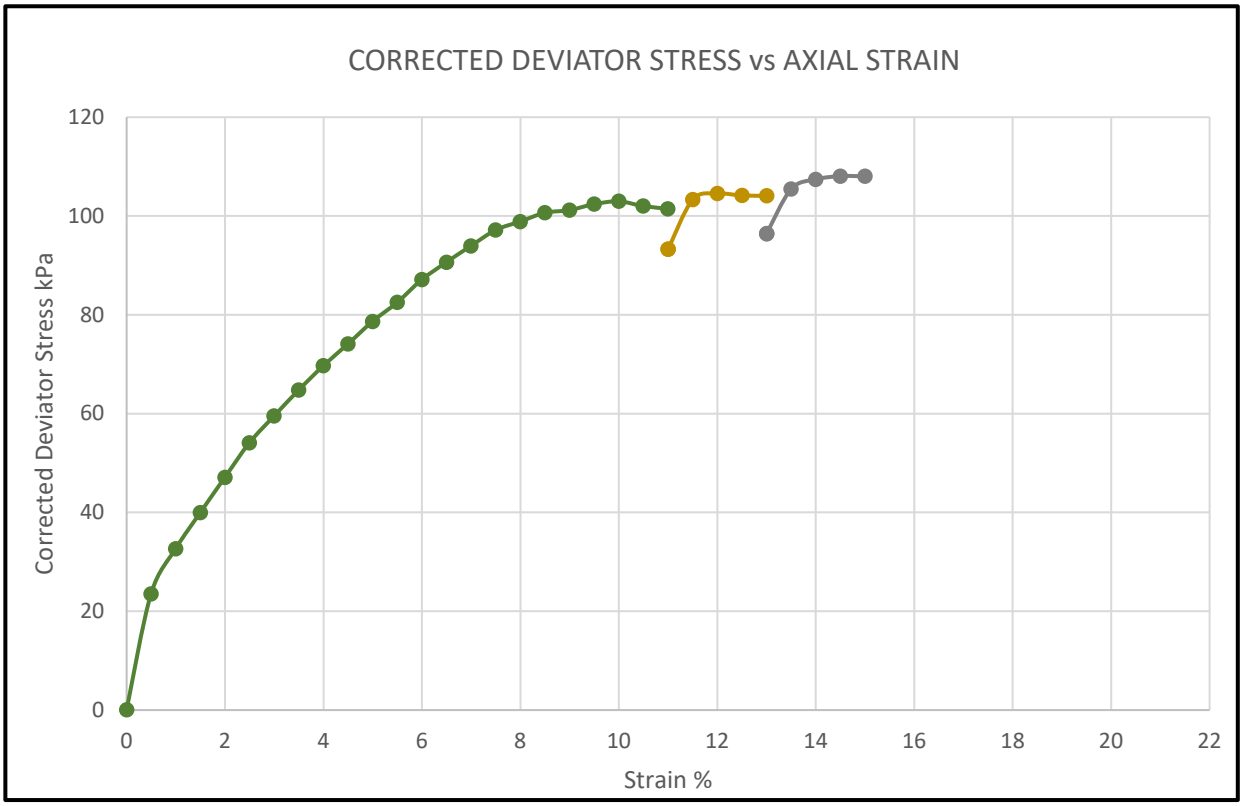
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	BH11 2.0-2.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613619	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

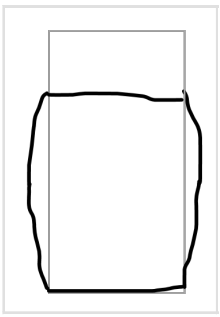
Specimen Location

Sample Length (mm)	365	Specimen depth from top of Sample (mm)		50
Sample Orientation	Vertical	Specimen Condition		Undisturbed
Specimen Length (mm)	199	Specimen Moisture Content (%)		21.3
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)		2.06
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)		1.70
Membrane Correction	1.19	1.37	1.51	



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
20	10	2	103.0	51
40	12	2	104.5	52
80	15	2	108.1	54

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

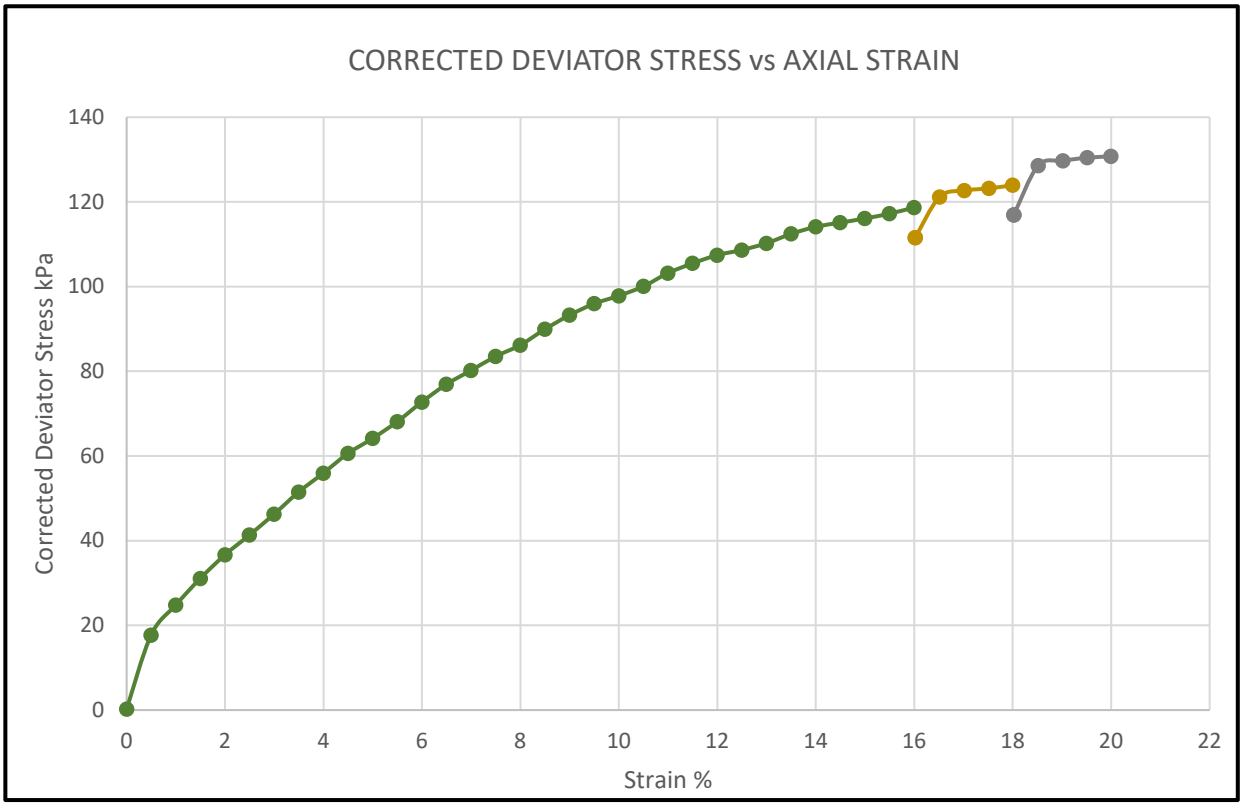
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	BH11 4.0-4.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	613620	**DATE RECEIVED**	11-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

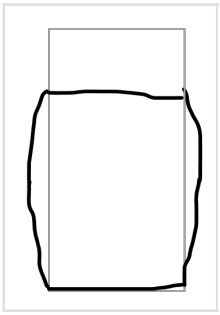
Specimen Location

Sample Length (mm)	440	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	20.9
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.14
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.77
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
40	16	2	117.2	59
80	18	2	123.2	62
160	20	2	130.4	65

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

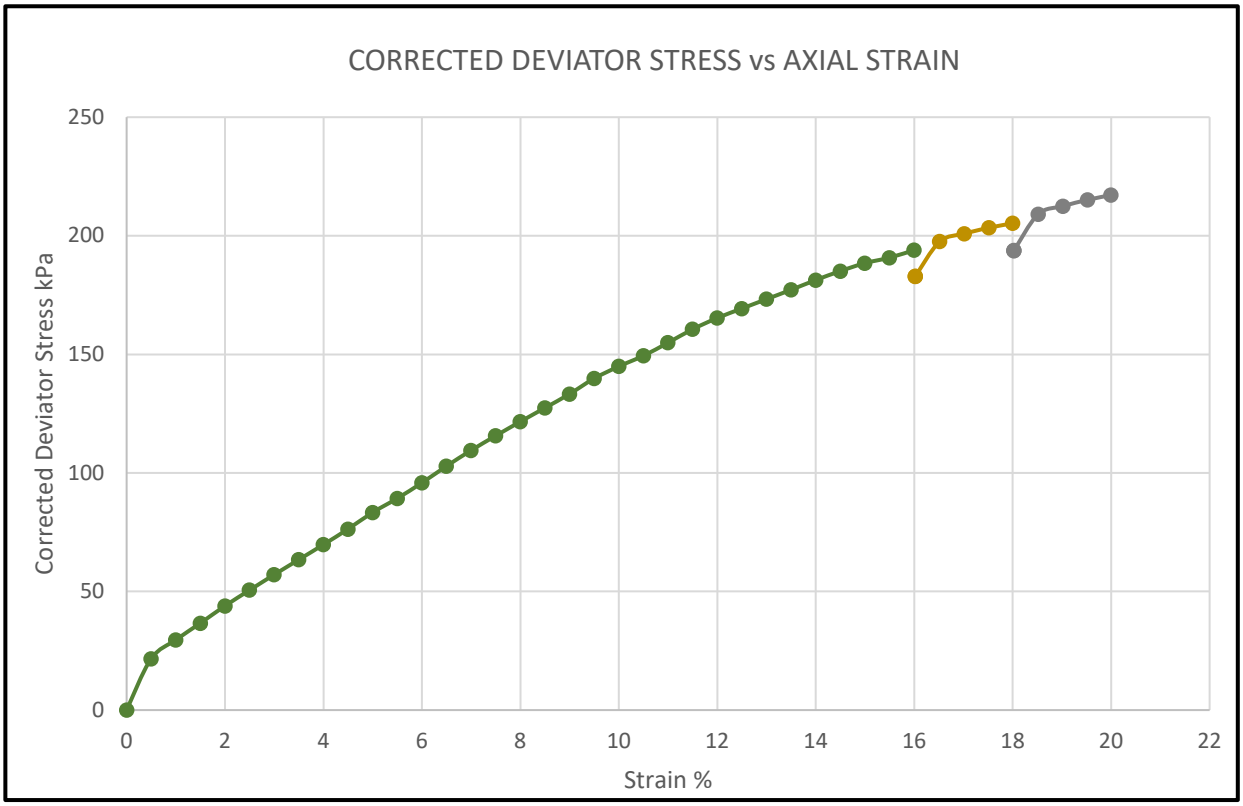
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP12 1.2-1.65 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616816	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

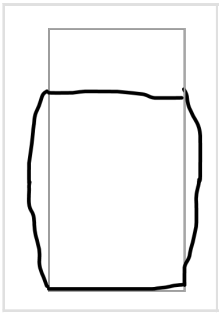
Specimen Location

Sample Length (mm)	270	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	20.9
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.12
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.75
Membrane Correction	1.27	1.39	1.50



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
15	16	2	190.8	95
30	18	2	203.4	102
60	20	2	215.1	108

Remarks/Abnormalities

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

Signed

Date 20 January 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

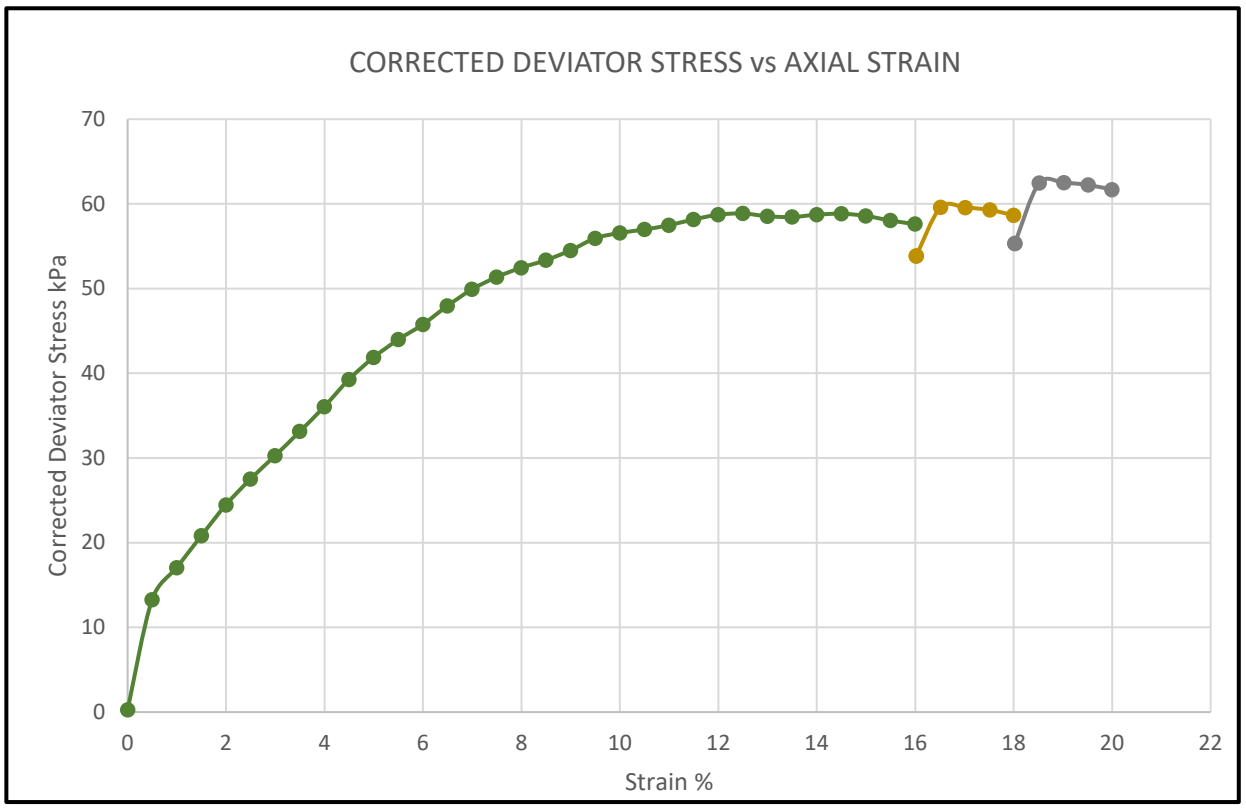
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP12 4.4-4.85 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616817	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

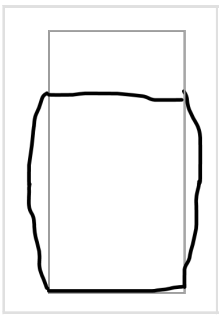
Specimen Location 

Sample Length (mm)	290	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	25.0
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.14
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.71
Membrane Correction	1.28	1.39	1.51



TEST TYPE
MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
45	13	2	58.9	29
90	17	2	59.6	30
180	19	2	62.5	31

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

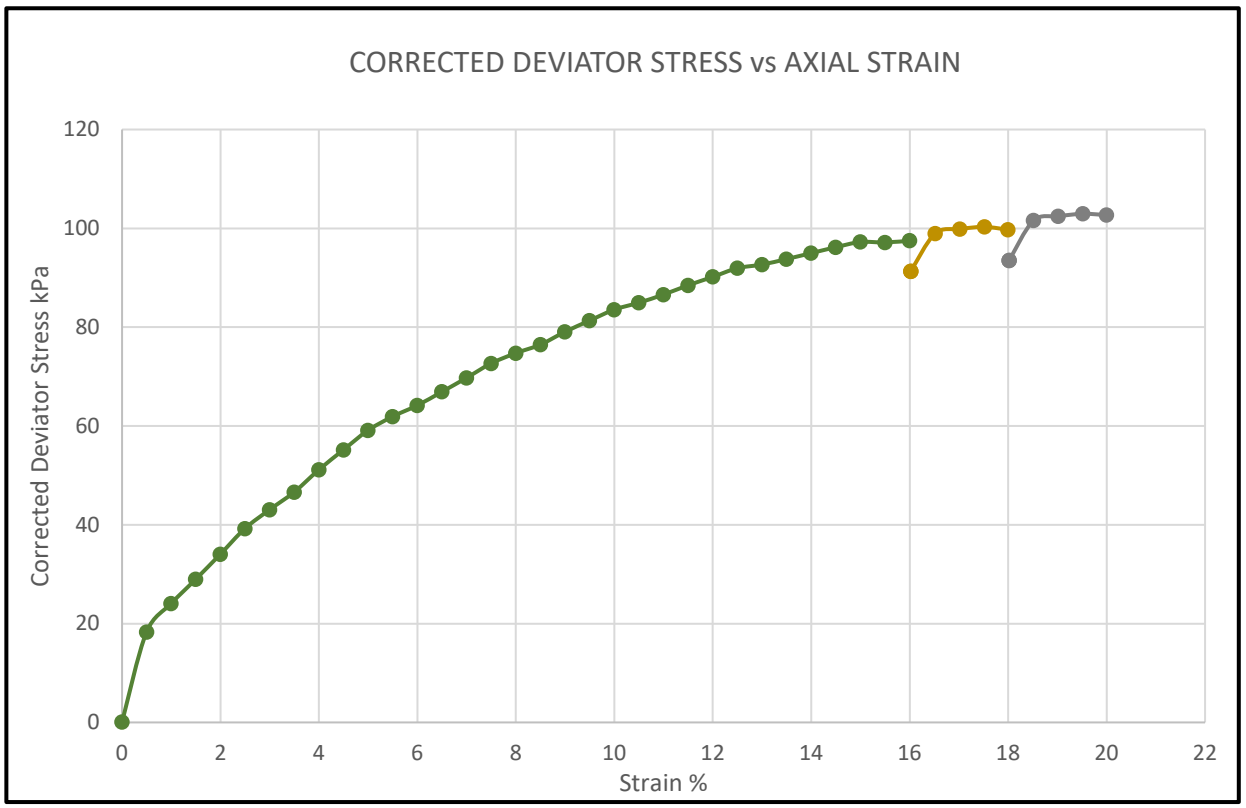
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP13 2.0-2.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616818	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

Sample Length (mm)	260	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	199	Specimen Moisture Content (%)	27.1
Specimen Diameter (mm)	99	Specimen Bulk Density (Mg/m3)	1.83
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.44
Membrane Correction	1.30	1.41	1.53

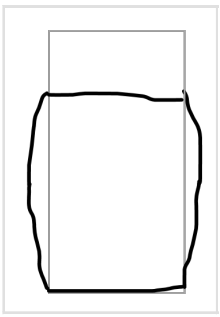


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
20	15	2	97.2	49
40	18	2	100.3	50
80	20	2	102.9	51

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

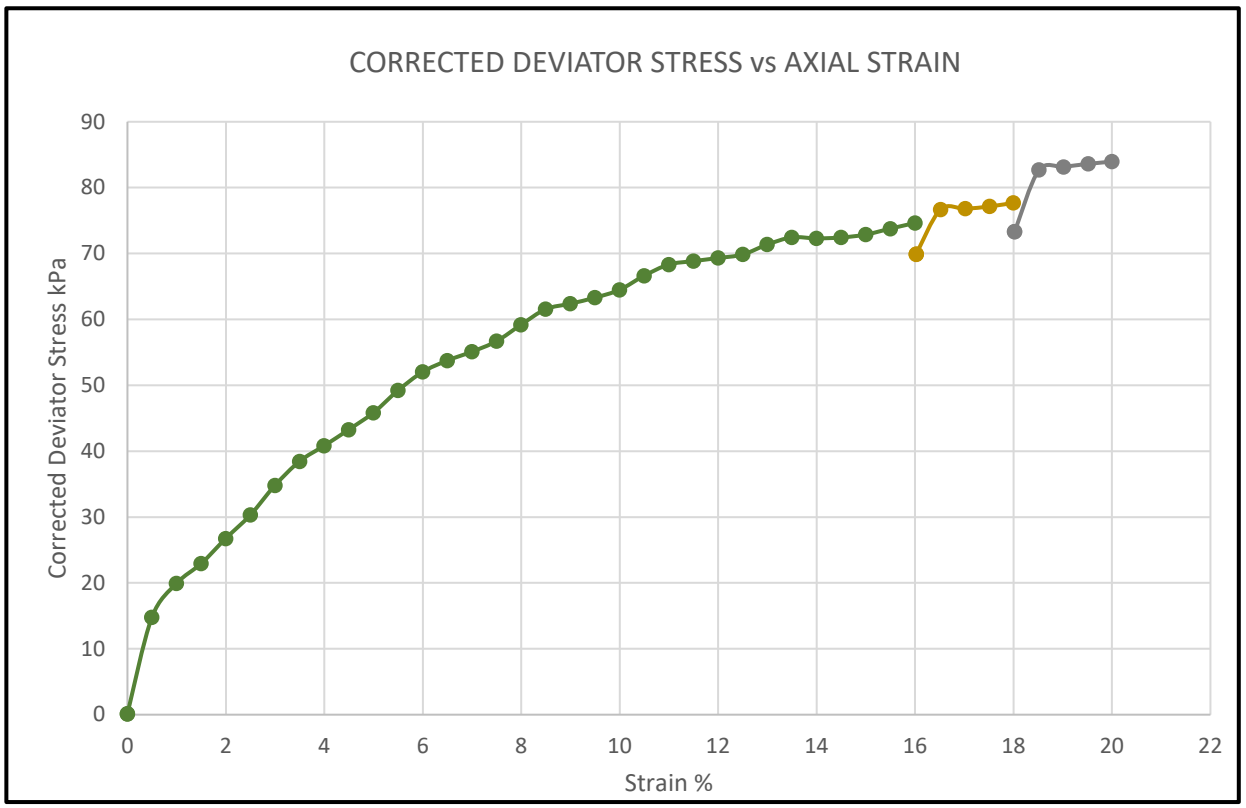
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP13 5.0-5.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616819	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Grey brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

Sample Length (mm)	360	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	21.7
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.08
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.71
Membrane Correction	1.28	1.39	1.51

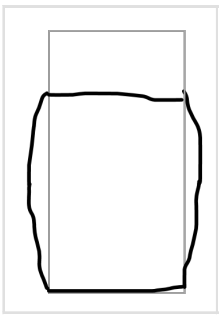


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
50	16	2	73.8	37
100	18	2	77.2	39
200	20	2	83.6	42

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
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UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

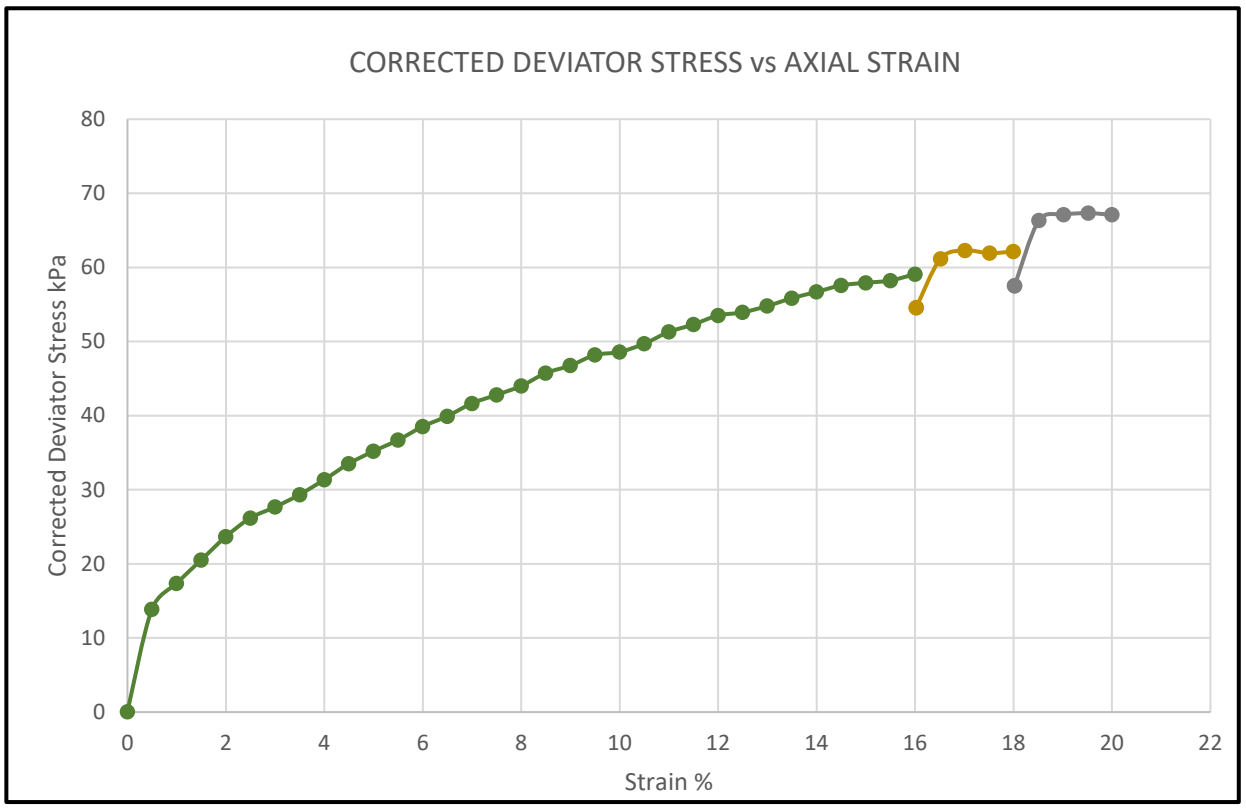
SAMPLE LABEL	CP14 4.0-4.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616820	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location



Sample Length (mm)	395	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	18.8
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.17
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.83
Membrane Correction	1.28	1.39	1.51

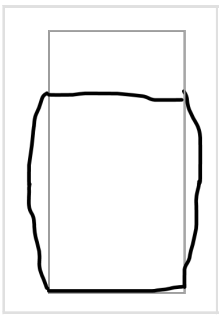


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
40	16	2	58.2	29
80	17	2	62.3	31
160	20	2	67.3	34

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

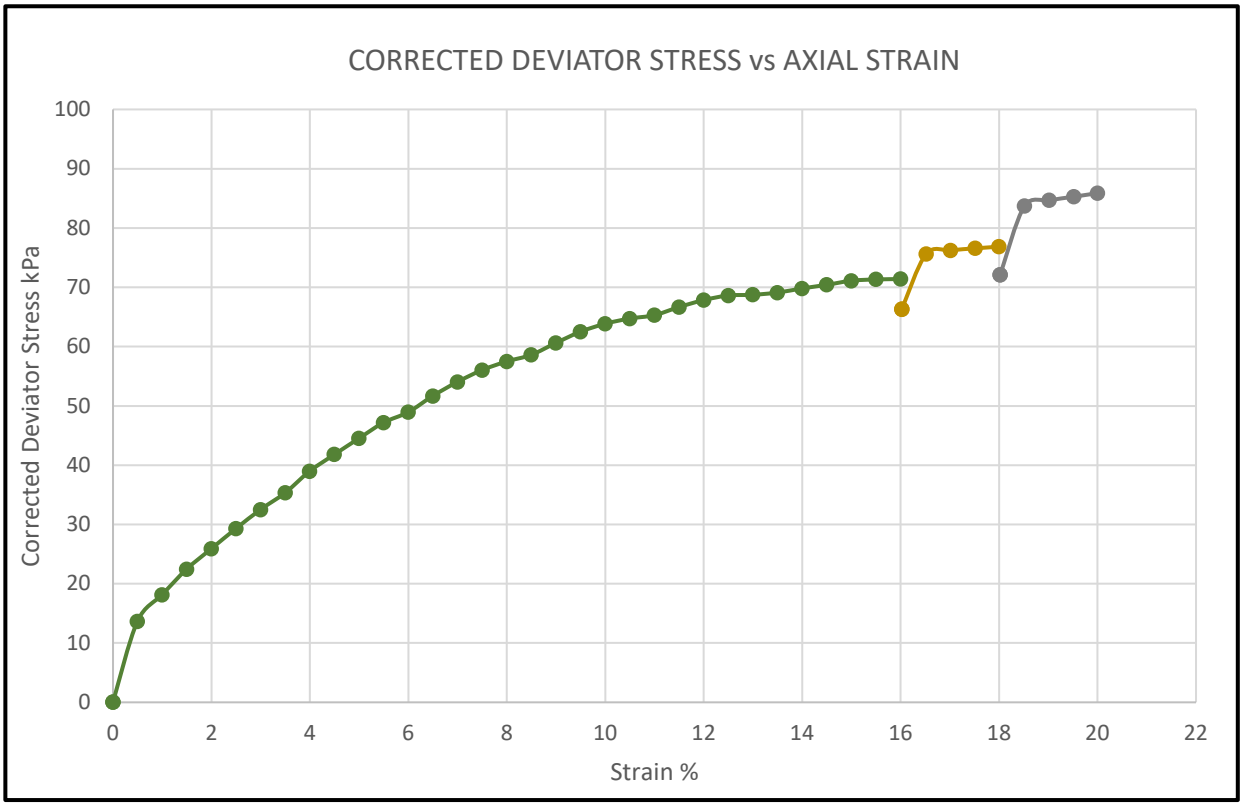
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP14 6.0-6.45 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616821	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

Sample Length (mm)	320	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	200	Specimen Moisture Content (%)	20.0
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.18
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.82
Membrane Correction	1.27	1.38 / 1.50	

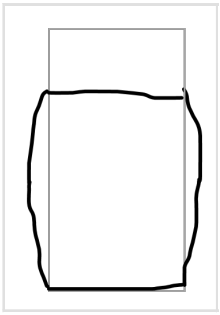


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
60	16	2	71.3	36
120	18	2	76.6	38
240	20	2	85.3	43

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

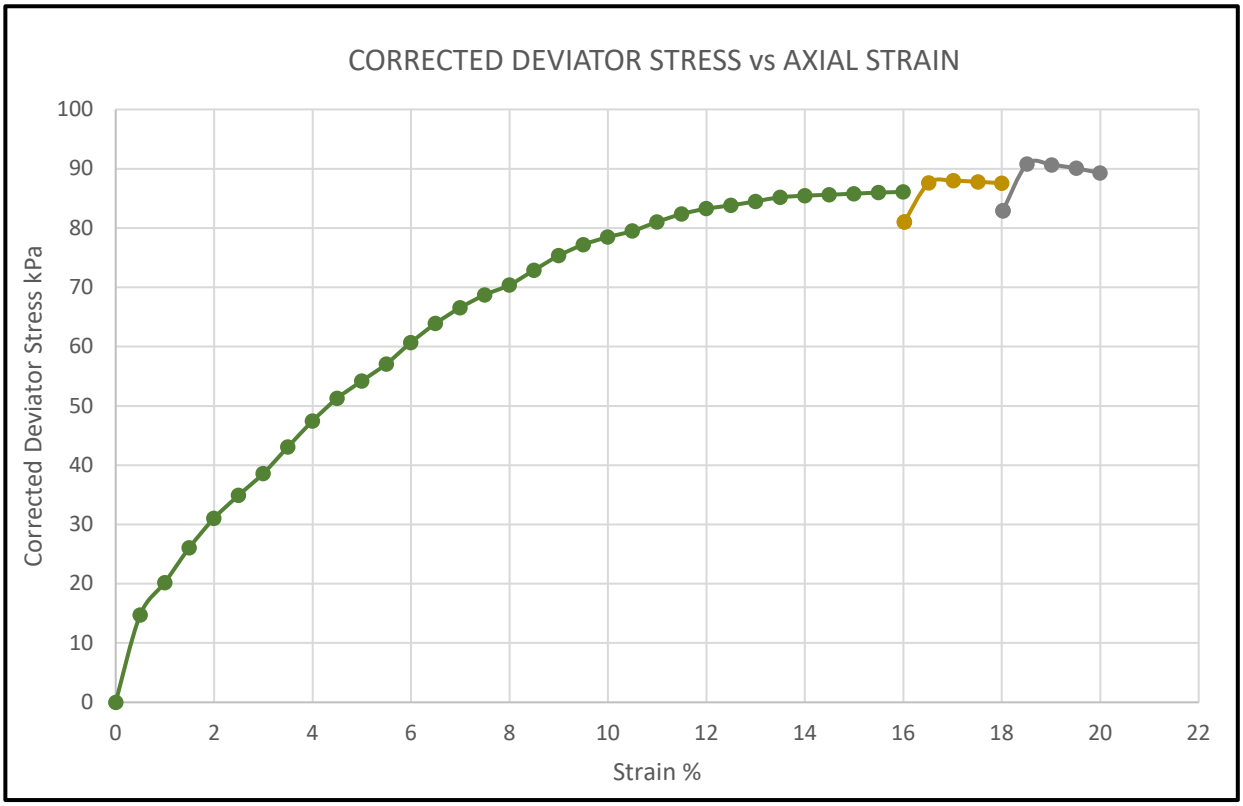
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP15 3.3-3.75 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616822	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location

Sample Length (mm)	270	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	22.9
Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.09
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.70
Membrane Correction	1.28	1.39	1.51

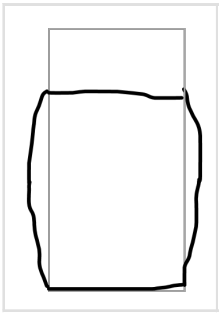


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
35	16	2	86.0	43
70	17	2	88.0	44
140	19	2	90.8	45

Remarks/Abnormalities

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

Signed

Date 20 January 2025

MURRAY RIX

ANDREW HOUSE, HADFIELD STREET,
DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870

UKAS TESTING 1580

TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS 1377 : PART 7: Clause 9 Multi Stage

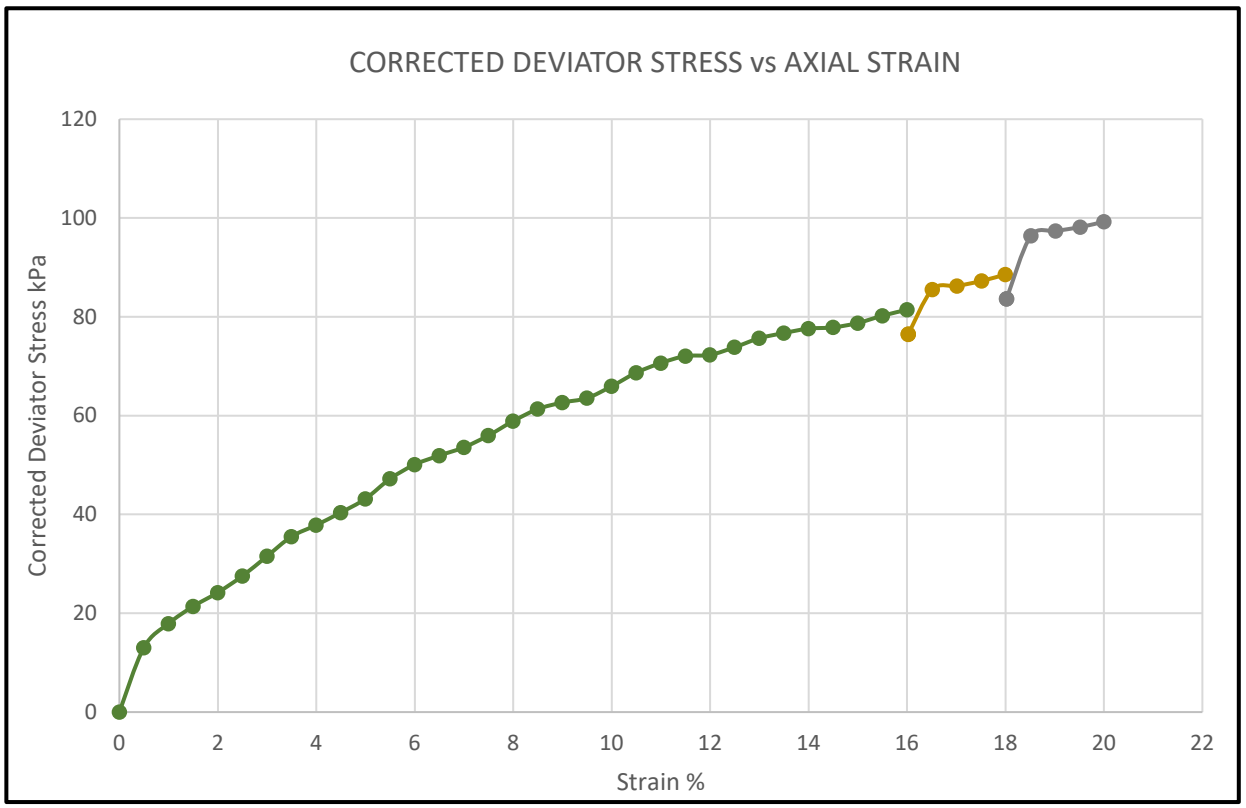
CLIENT	Tier Environmental Ltd
SITE	TE1890 - Plot 2, Marchwiel, Wrexham
JOB NUMBER	MRN 25010/4

SAMPLE LABEL	CP15 7.6-8.05 U	**DATE SAMPLED**	Not advised
LAB SAMPLE No.	616823	**DATE RECEIVED**	17-Dec-24
DATE TESTED	09-Jan-25	**SAMPLED BY**	Client
MATERIAL	Brown silty slighty sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

Specimen Location 

Sample Length (mm)	365	Specimen depth from top of Sample (mm)	50
Sample Orientation	Vertical	Specimen Condition	Undisturbed
Specimen Length (mm)	201	Specimen Moisture Content (%)	19.5
Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.17
Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.82
Membrane Correction	1.27	1.39	1.50

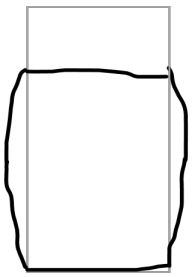


616818

TEST TYPE

MULTI STAGE

SKETCH OF SPECIMEN AT FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
80	16	2	80.2	40
160	18	2	87.3	44
320	20	2	98.1	49

Remarks/Abnormalities

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

Signed 

Date 20 January 2025

APPENDIX F - GROUNDWATER AND GAS MONITORING RESULTS & GAS ANALYSER CALIBRATION CERTIFICATE

GAS AND GROUNDWATER MONITORING ACROSS BOREHOLE LOCATIONS FIELD PROFORMA

JOB DETAILS:	
Client:	Net World Sports
Site:	Plot 2, Marchwiel Wrexham
Date:	09.01.2025

Job No:	TE1890		
Visit No:	1	of	4
Operator:	LEE HOGG		
Project Manager:	SEAN LEE		

Ground Gas Instrument	GA5000										
Ambient Gas Concentrations:	CH_4	ND	CO_2	0.2	O_2	21					
METEOROLOGICAL AND SITE INFORMATION											
State of ground:		Dry		Moist		Wet	X	Snow		Frozen	
Wind:		Calm	X	Light		Moderate		Strong			
Cloud cover:		None		Slight		Cloudy	X	Overcast			
Preciptation:		None	X	Slight		Moderate		Heavy			
Barometric pressure (mbar):			993	Before			1001	After			
Pressure Trend				Falling		Steady	X	Rising			

Key

CS	Hazard Potential	GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% CH4 and <5% CO2
CS2	Low	<0.70	Typical measured flow rate <70 l/h
CS3	Moderate	<3.5	N/A
CS4	Moderate to High	<15	N/A
CS5	High	<70	N/A
CS6	Very High	>70	N/A

Monitoring Point	FLOW DATA		GAS CONCENTRATIONS										WELL AND WATER DATA				RESPONSE ZONE	COMMENTS
	Flow rate (l/hr)		Methane (%v/v) CH4		Carbon dioxide (%v/v) CO2		Oxygen (%v/v) O2		Carbon monoxide (ppm) CO		Hydrogen sulphide (ppm) H2S		Water Depth (mbgl)	Depth of Well (mbgl)	Ground Level (mAOD)	Water Level (mAOD)		
	Peak	Steady	Peak	Steady	Peak	Steady	Lowest	Steady	Peak	Steady	Peak	Steady						
CP01	3.8	ND	ND	ND	4.4	4.4	14.5	14.5	3	3	ND	ND	1.12	9.49	43.73	42.61	Till	
CP02	ND	ND	ND	ND	1.4	1.4	18.7	18.7	6	2	ND	ND	0.76	9.69	42.80	42.04	Till	water drawn up the pipe before 5 mins, this test was cut short
CP03	1.9	ND	ND	ND	0.3	0.3	20.9	20.9	ND	ND	ND	ND	2.92	9.97	45.23	42.31	Till	
CP04	ND	ND	ND	ND	0.4	0.4	21.3	21.3	10	ND	ND	ND	0.77	9.12	41.98	41.21	Till	
CP05	ND	ND	ND	ND	1.8	1.8	11.3	11.3	23	17	ND	ND	0.62	9.68	41.65	41.03	Till	water drawn up the pipe before 5 mins, this test was cut short
CP06	ND	ND	ND	ND	2.4	0.2	15.5	15.7	7	ND	ND	ND	0.87	9.38	41.43	40.56	Till	
CP07	ND	ND	ND	ND	3.7	3.7	5.3	5.3	6	3	ND	ND	1.19	9.75	40.56	39.37	Till	
CP08	0.1	0.1	ND	ND	1.6	1.6	19.0	19.0	4	1	ND	ND	1.09	9.08	41.31	40.22	Till	pipe dent unable to take water sample
CP09	ND	ND	ND	ND	1.9	1.9	12.9	12.9	1	1	ND	ND	0.97	9.60	38.63	37.66	Till	
CP10	13.3	0.2	ND	ND	2.0	2.0	15.0	15.0	2	2	ND	ND	0.93	9.92	39.46	38.53	Till	
CP11	ND	ND	ND	ND	0.6	0.6	12.3	12.3	2	ND	ND	ND	0.81	9.47	37.57	36.76	Till	
CP12	ND	ND	ND	ND	0.8	0.4	18.9	20.4	13	ND	ND	ND	1.37	8.80	38.12	36.75	Till	
CP13	1.5	0.3	ND	ND	1.7	1.7	18.1	18.1	9	3	ND	ND	0.91	9.25	38.41	37.50	Till	
CP14	1.5	0.2	ND	ND	1.2	1.2	13.9	13.9	42	3	ND	ND	0.73	9.24	36.52	35.79	Till	
CP15	ND	ND	ND	ND	0.6	0.6	15.8	15.8	11	1	ND	ND	1.15	8.41	36.32	35.17	Till	
CP16	0.8	0.1	ND	ND	0.8	0.8	7.7	7.7	7	ND	ND	ND	1.28	8.91	34.70	33.42	Till	
CP17	6.9	0.8	ND	ND	2.4	0.7	15.7	20.2	6	1	ND	ND	0.74	9.49	35.98	35.24	Till	
CP18	0.3	ND	ND	ND	2.2	2.2	15.2	15.2	8	1	ND	ND	0.94	9.87	36.35	35.41	Till	water drawn up the pipe before 5 mins, this test was cut short
WS03	3.7	ND	ND	ND	1.5	0.7	4.9	5.0	8	8	ND	ND	0.18	3.96	44.47	44.29	Till	water drawn up the pipe before 5 mins, this test was cut short
WS04	0.6	0.2	ND	ND	2.7	2.7	15.5	15.5	8	7	ND	ND	0.45	3.92	41.26	40.81	Till	water drawn up the pipe before 5 mins, this test was cut short
WS06	3.3	0.2	ND	ND	3.7	3.7	5.0	5.8	73	6	ND	ND	0.66	3.67	39.67	39.01	Till	
WS08	0.1	0.1	ND	ND	3.9	3.9	12.4	12.8	1	ND	ND	ND	0.93	3.73	39.75	38.82	Till	
WS09	ND	ND	ND	ND	3.7	3.7	15.4	15.4	2	ND	ND	ND	1.13	3.54	37.41	36.28	Till	
WS12	2.0	ND	0.1	ND	0.2	0.1	19.6	20.9	23	2	ND	ND	0.89	3.15	35.24	34.35	Till	
Min	0.1	0.1	0.1	0.1	0.2	0.1	4.9	5.0	ND	ND	ND	ND	0.18	3.15	34.70	33.42		
Max	13.3	0.8	0.1	0.1	4.4	4.4	21.3	21.3	73	17	ND	ND	2.92	9.97	45.23	44.29		

Borehole Hazardous Gas Flow Rates (l/hr)							
Peak Flow Rates				Steady Flow Rates			
CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)	CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)
0.0038	0.1672	0.0038	0.1672	0.0001	0.0044	0.0001	0.0044
0.0001	0.0014	0.0001	0.0014	0.0001	0.0014	0.0001	0.0014
0.0019	0.0057	0.0019	0.0057	0.0001	0.0003	0.0001	0.0003
0.0001	0.0004	0.0001	0.0004	0.0001	0.0004	0.0001	0.0004
0.0001	0.0018	0.0001	0.0018	0.0001	0.0018	0.0001	0.0018
0.0001	0.0024	0.0001	0.0002	0.0001	0.0024	0.0001	0.0002
0.0001	0.0037	0.0001	0.0037	0.0001	0.0037	0.0001	0.0037
0.0001	0.0016	0.0001	0.0016	0.0001	0.0016	0.0001	0.0016
0.0001	0.0019	0.0001	0.0019	0.0001	0.0019	0.0001	0.0019
0.0133	0.266	0.0133	0.266	0.0002	0.004	0.0002	0.004
0.0001	0.0006	0.0001	0.0006	0.0001	0.0006	0.0001	0.0006
0.0001	0.0008	0.0001	0.0004	0.0001	0.0008	0.0001	0.0004
0.0015	0.0255	0.0015	0.0255	0.0003	0.0051	0.0003	0.0051
0.0015	0.018	0.0015	0.018	0.0002	0.0024	0.0002	0.0024
0.0001	0.0006	0.0001	0.0006	0.0001	0.0006	0.0001	0.0006
0.0008	0.0064	0.0008	0.0064	0.0001	0.0008	0.0001	0.0008
0.0069	0.1656	0.0069	0.0483	0.0008	0.0192	0.0008	0.0056
0.0003	0.0066	0.0003	0.0066	0.0001	0.0022	0.0001	0.0022
0.0037	0.0555	0.0037	0.0259	0.0001	0.0015	0.0001	0.0007
0.0006	0.0162	0.0006	0.0162	0.0002	0.0054	0.0002	0.0054
0.0033	0.1221	0.0033	0.1221	0.0002	0.0074	0.0002	0.0074
0.0001	0.0039	0.0001	0.0039	0.0001	0.0039	0.0001	0.0039
0.0001	0.0037	0.0001	0.0037	0.0001	0.0037	0.0001	0.0037
0.002	0.004	0.002	0.002	0.0001	0.0002	0.0001	0.0001

GAS AND GROUNDWATER MONITORING ACROSS BOREHOLE LOCATIONS FIELD PROFORMA

JOB DETAILS:	
Client:	Net World Sports
Site:	Plot 2, Marchwiel Wrexham
Date:	14.01.2025

Job No:	TE1890		
Visit No:	2	of	4
Operator:	LEE HOGG		
Project Manager:	SEAN LEE		

Ground Gas Instrument	GA5000										
Ambient Gas Concentrations:	CH_4	ND	CO_2	0.2	O_2	21					
METEOROLOGICAL AND SITE INFORMATION											
State of ground:		Dry		Moist	X	Wet		Snow		Frozen	
Wind:		Calm	X	Light		Moderate		Strong			
Cloud cover:		None		Slight	X	Cloudy		Overcast			
Preciptation:	X	None		Slight		Moderate		Heavy			
Barometric pressure (mbar):			1024	Before			1027	After			
Pressure Trend				Falling	x	Steady		Rising			

Key

CS	Hazard Potential	GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% CH4 and <5% CO2
CS2	Low	<0.70	Typical measured flow rate <70 l/h
CS3	Moderate	<3.5	N/A
CS4	Moderate to High	<15	N/A
CS5	High	<70	N/A
CS6	Very High	>70	N/A

Monitoring Point	FLOW DATA		GAS CONCENTRATIONS										WELL AND WATER DATA				RESPONSE ZONE	COMMENTS
	Flow rate (l/hr)		Methane (%v/v) CH4		Carbon dioxide (%v/v) CO2		Oxygen (%v/v) O2		Carbon monoxide (ppm) CO		Hydrogen sulphide (ppm) H2S		Water Depth (mbgl)	Depth of Well (mbgl)	Ground Level (mAOD)	Water Level (mAOD)		
	Peak	Steady	Peak	Steady	Peak	Steady	Lowest	Steady	Peak	Steady	Peak	Steady						
CP01	ND	ND	ND	ND	3.7	3.7	14.6	14.6	7	ND	ND	ND	1.21	9.38	43.73	42.52	Till	
CP02	5.8	0.2	ND	ND	1.4	1.4	19.8	19.8	2	1	ND	ND	0.79	9.68	42.80	42.01	Till	test cut short because of water in the pipe before 5 mins
CP03	14.3	0.3	ND	ND	1.2	1.2	16.6	16.6	ND	ND	ND	ND	3.38	9.78	45.23	41.85	Till	
CP04	ND	ND	ND	ND	0.7	0.1	20.5	21.2	1	ND	ND	ND	0.78	9.09	41.98	41.20	Till	
CP05	3.0	3.0	ND	ND	1.4	1.4	20.0	20.0	3	1	ND	ND	0.60	9.62	41.65	41.05	Till	test cut short because of water in the pipe before 5 mins
CP06	ND	ND	ND	ND	5.2	3.5	9.5	14.0	1	ND	ND	ND	0.93	9.35	41.43	40.50	Till	
CP07	ND	ND	ND	ND	3.5	3.5	3.2	3.2	11	ND	ND	ND	1.21	9.72	40.56	39.35	Till	
CP08	ND	ND	ND	ND	2.9	2.9	15.0	15.0	3	ND	ND	ND	1.35	9.02	41.31	39.96	Till	
CP09	ND	ND	0.1	ND	1.3	1.3	19.0	19.0	1	ND	ND	ND	1.19	9.60	38.63	37.44	Till	
CP10	4.8	ND	ND	ND	1.5	1.5	17.2	17.2	3	3	ND	ND	0.71	9.91	39.46	38.75	Till	
CP11	7.4	0.2	ND	ND	0.5	0.5	15.9	15.9	ND	ND	ND	ND	1.72	9.87	37.57	35.85	Till	
CP12	3.2	0.2	ND	ND	1.1	1.1	18.1	18.1	3	3	ND	ND	1.38	8.78	38.12	36.74	Till	
CP13	0.4	0.1	ND	ND	1.1	1.1	20.3	20.3	2	ND	ND	ND	0.88	9.24	38.41	37.53	Till	
CP14	ND	ND	0.1	ND	0.8	0.8	4.6	4.6	17	ND	ND	ND	1.06	9.08	36.52	35.46	Till	
CP15	ND	ND	ND	ND	0.3	0.3	20.4	20.4	4	1	ND	ND	1.24	8.37	36.32	35.08	Till	
CP16	0.7	0.1	ND	ND	0.5	0.4	15.1	18.0	1	1	ND	ND	1.31	8.83	34.70	33.39	Till	test cut short because of water in the pipe before 5 mins
CP17	0.4	0.4	ND	ND	1.9	1.9	17.9	17.9	10	9	ND	ND	0.60	9.29	35.98	35.38	Till	
CP18	3.9	0.3	ND	ND	1.2	1.2	20.6	20.6	5	5	ND	ND	1.02	9.84	36.35	35.33	Till	
WS03	6.0	ND	ND	ND	1.3	0.6	14.4	14.4	2	2	ND	ND	0.17	3.95	44.47	44.30	Till	test cut short because of water in the pipe before 5 mins
WS04	10.3	0.4	ND	ND	3.4	3.4	3.6	3.6	30	ND	ND	ND	0.69	3.92	41.26	40.57	Till	
WS06	ND	ND	0.2	ND	2.4	2.4	8.7	8.7	88	ND	ND	ND	0.87	3.66	39.67	38.80	Till	
WS08	ND	ND	ND	ND	3.6	3.6	13.5	13.5	ND	ND	ND	ND	1.12	3.66	39.75	38.63	Till	
WS09	ND	ND	ND	ND	3.6	3.6	14.6	14.6	1	ND	ND	ND	1.15	3.85	37.41	36.26	Till	
WS12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	35.24		Till	standing water, unable to monitor
Min	0.1	0.1	0.1	0.1	0.3	0.1	3.2	3.2	ND	ND	ND	ND	0.17	3.66	34.70	33.39		
Max	14.3	3.0	0.2	0.1	5.2	3.7	20.6	21.2	88	9	ND	ND	3.38	9.91	45.23	44.30		

Borehole Hazardous Gas Flow Rates (l/hr)							
Peak Flow Rates				Steady Flow Rates			
CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)	CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)
0.0001	0.0037	0.0001	0.0037	0.0001	0.0037	0.0001	0.0037
0.0058	0.0812	0.0058	0.0812	0.0002	0.0028	0.0002	0.0028
0.0143	0.1716	0.0143	0.1716	0.0003	0.0036	0.0003	0.0036
0.0001	0.0007	0.0001	0.0001	0.0001	0.0007	0.0001	0.0001
0.003	0.042	0.003	0.042	0.003	0.042	0.003	0.042
0.0001	0.0052	0.0001	0.0035	0.0001	0.0052	0.0001	0.0035
0.0001	0.0035	0.0001	0.0035	0.0001	0.0035	0.0001	0.0035
0.0001	0.0029	0.0001	0.0029	0.0001	0.0029	0.0001	0.0029
0.0001	0.0013	0.0001	0.0013	0.0001	0.0013	0.0001	0.0013
0.0048	0.072	0.0048	0.072	0.0001	0.0015	0.0001	0.0015
0.0074	0.037	0.0074	0.037	0.0002	0.001	0.0002	0.001
0.0032	0.0352	0.0032	0.0352	0.0002	0.0022	0.0002	0.0022
0.0004	0.0044	0.0004	0.0044	0.0001	0.0011	0.0001	0.0011
0.0001	0.0008	0.0001	0.0008	0.0001	0.0008	0.0001	0.0008
0.0001	0.0003	0.0001	0.0003	0.0001	0.0003	0.0001	0.0003
0.0007	0.0035	0.0007	0.0028	0.0001	0.0005	0.0001	0.0004
0.0004	0.0076	0.0004	0.0076	0.0004	0.0076	0.0004	0.0076
0.0039	0.0468	0.0039	0.0468	0.0003	0.0036	0.0003	0.0036
0.006	0.078	0.006	0.036	0.0001	0.0013	0.0001	0.0006
0.0103	0.3502	0.0103	0.3502	0.0004	0.0136	0.0004	0.0136
0.0002	0.0024	0.0001	0.0024	0.0002	0.0024	0.0001	0.0024
0.0001	0.0036	0.0001	0.0036	0.0001	0.0036	0.0001	0.0036
0.0001	0.0036	0.0001	0.0036	0.0001	0.0036	0.0001	0.0036
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

GAS AND GROUNDWATER MONITORING ACROSS BOREHOLE LOCATIONS FIELD PROFORMA

JOB DETAILS:	
Client:	Net World Sports
Site:	Plot 2, Marchwiel Wrexham
Date:	28.01.2025

Job No:	TE1890		
Visit No:	3	of	4
Operator:	LEE HOGG		
Project Manager:	SEAN LEE		

Ground Gas Instrument	GA5000										
Ambient Gas Concentrations:	CH_4	ND	CO_2	0.1	O_2	20.9					
METEOROLOGICAL AND SITE INFORMATION											
State of ground:		Dry		Moist	X	Wet		Snow		Frozen	
Wind:		Calm	X	Light		Moderate		Strong			
Cloud cover:		None		Slight		Cloudy	X	Overcast			
Preciptation:		None	X	Slight		Moderate		Heavy			
Barometric pressure (mbar):			972	Before			975	After			
Pressure Trend				Falling	X	Steady		Rising			

Key

CS	Hazard Potential	GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% CH4 and <5% CO2
CS2	Low	<0.70	Typical measured flow rate <70 l/h
CS3	Moderate	<3.5	N/A
CS4	Moderate to High	<15	N/A
CS5	High	<70	N/A
CS6	Very High	>70	N/A

Monitoring Point	FLOW DATA		GAS CONCENTRATIONS										WELL AND WATER DATA				RESPONSE ZONE	COMMENTS
	Flow rate (l/hr)		Methane (%v/v) CH4		Carbon dioxide (%v/v) CO2		Oxygen (%v/v) O2		Carbon monoxide (ppm) CO		Hydrogen sulphide (ppm) H2S		Water Depth (mbgl)	Depth of Well (mbgl)	Ground Level (mAOD)	Water Level (mAOD)		
	Peak	Steady	Peak	Steady	Peak	Steady	Lowest	Steady	Peak	Steady	Peak	Steady						
CP01	4.5	ND	ND	ND	4.4	4.4	12.7	12.7	ND	ND	ND	ND	1.11	9.38	43.73	42.62	Till	
CP02	6.7	ND	ND	ND	1.2	1.2	20.6	20.6	1	1	ND	ND	0.74	9.66	42.80	42.06	Till	
CP03	13.9	0.2	ND	ND	1.4	1.4	14.6	14.6	ND	ND	ND	ND	3.38	9.90	45.23	41.85	Till	
CP04	ND	ND	ND	ND	0.3	0.1	20.2	21.2	9	1	ND	ND	0.78	9.05	41.98	41.20	Till	
CP05	ND	ND	ND	ND	1.4	1.4	16.5	16.5	41	41	ND	ND	0.59	9.54	41.65	41.06	Till	
CP06	-0.1	ND	ND	ND	5.6	5.6	6.8	6.8	ND	ND	ND	ND	0.78	9.36	41.43	40.65	Till	
CP07	-2.0	-0.2	ND	ND	4.0	4.0	2.3	2.3	ND	ND	ND	ND	1.19	9.70	40.56	39.37	Till	
CP08	ND	ND	ND	ND	0.4	0.1	17.7	17.7	8	8	ND	ND	1.08	8.94	41.31	40.23	Till	
CP09	2.2	ND	NR	NR	NR	NR	NR	NR	44	NR	ND	NR	0.94	9.85	38.63	37.69	Till	Pressure in pipe causing pump shut off
CP10	3.7	ND	NR	NR	NR	NR	NR	NR	3	NR	ND	NR	0.68	9.92	39.46	38.78	Till	Pressure in pipe causing pump shut off
CP11	ND	ND	NR	NR	NR	NR	NR	NR	4	NR	ND	NR	1.50	9.49	37.57	36.07	Till	Pressure in pipe causing pump shut off
CP12	-3.5	ND	NR	NR	NR	NR	NR	NR	4	NR	ND	NR	1.28	8.76	38.12	36.84	Till	Pressure in pipe causing pump shut off
CP13	2.3	0.1	ND	ND	1.4	1.4	19.0	19.0	25	ND	ND	ND	0.97	9.19	38.41	37.44	Till	
CP14	-12.2	-0.8	0.1	ND	3.3	3.3	0.6	0.6	24	2	ND	ND	0.71	9.04	36.52	35.81	Till	
CP15	ND	ND	NR	NR	NR	NR	NR	NR	5	NR	ND	NR	1.23	8.32	36.32	35.09	Till	Pressure in pipe causing pump shut off
CP16	2.4	ND	NR	NR	NR	NR	NR	NR	62	NR	ND	NR	1.19	8.82	34.70	33.51	Till	Pressure in pipe causing pump shut off
CP17	-4.7	ND	NR	NR	NR	NR	NR	NR	12	NR	ND	NR	0.56	9.28	35.98	35.42	Till	Pressure in pipe causing pump shut off, and water drawn up pipe
CP18	ND	ND	NR	NR	NR	NR	NR	NR	53	NR	ND	NR	0.86	9.81	36.35	35.49	Till	Pressure in pipe causing pump shut off
WS03	0.2	ND	ND	ND	1.5	1.4	10.2	10.4	1	1	ND	ND	0.15	3.95	44.47	44.32	Till	
WS04	ND	ND	ND	ND	3.3	3.3	15.1	15.1	3	ND	ND	ND	0.42	3.94	41.26	40.84	Till	
WS06	-9.0	-0.4	ND	ND	2.7	2.7	6.0	6.6	38	4	ND	ND	0.10	3.66	39.67	39.57	Till	
WS08	4.7	0.1	ND	ND	3.2	3.2	14.1	14.1	ND	ND	ND	ND	0.94	3.65	39.75	38.81	Till	
WS09	ND	ND	NR	NR	NR	NR	NR	NR	106	NR	ND	NR	1.14	3.55	37.41	36.27	Till	
WS12	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	35.24		Till	standing water, unable to monitor
Min	0.1	0.1	0.1	0.1	0.3	0.1	0.6	0.6	ND	ND	ND	ND	0.10	3.55	34.70	33.51		
Max	13.9	0.2	0.1	0.1	5.6	5.6	20.6	21.2	106	41	ND	ND	3.38	9.92	45.23	44.32		

Borehole Hazardous Gas Flow Rates (l/hr)								
Peak Flow Rates				Steady Flow Rates				
CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)	CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)
0.0045	0.198	0.0045	0.198	0.0001	0.0044	0.0001	0.0044
0.0067	0.0804	0.0067	0.0804	0.0001	0.0012	0.0001	0.0012
0.0139	0.1946	0.0139	0.1946	0.0002	0.0028	0.0002	0.0028
0.0001	0.0003	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001
0.0001	0.0014	0.0001	0.0014	0.0001	0.0014	0.0001	0.0014
-0.0001	-0.0056	-0.0001	-0.0056	0.0001	0.0056	0.0001	0.0056
-0.002	-0.08	-0.002	-0.08	-0.0002	-0.008	-0.0002	-0.008
0.0001	0.0004	0.0001	0.0001	0.0001	0.0004	0.0001	0.0001
0.0022	0.0022	0.0022	0.0022	0.0001	0.0001	0.0001	0.0001
0.0037	0.0037	0.0037	0.0037	0.0001	0.0001	0.0001	0.0001
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-0.0035	-0.0035	-0.0035	-0.0035	0.0001	0.0001	0.0001	0.0001
0.0023	0.0322	0.0023	0.0322	0.0001	0.0014	0.0001	0.0014
-0.0122	-0.4026	-0.0122	-0.4026	-0.0008	-0.0264	-0.0008	-0.0264
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
0.0024	0.0024	0.0024	0.0024	0.0001	0.0001	0.0001	0.0001
-0.0047	-0.0047	-0.0047	-0.0047	0.0001	0.0001	0.0001	0.0001
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
0.0002	0.003	0.0002	0.0028	0.0001	0.0015	0.0001	0.0014
0.0001	0.0033	0.0001	0.0033	0.0001	0.0033	0.0001	0.0033
-0.009	-0.243	-0.009	-0.243	-0.0004	-0.0108	-0.0004	-0.0108
0.0047	0.1504	0.0047	0.1504	0.0001	0.0032	0.0001	0.0032
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

GAS AND GROUNDWATER MONITORING ACROSS BOREHOLE LOCATIONS FIELD PROFORMA

JOB DETAILS:	
Client:	Net World Sports
Site:	Plot 2, Marchwiel Wrexham
Date:	07.02.2025

Job No:	TE1890		
Visit No:	4	of	4
Operator:	LEE HOGG		
Project Manager:	SEAN LEE		

Ground Gas Instrument	GA5000						
Ambient Gas Concentrations:	CH_4	ND	CO_2	0.2	O_2	21.2	

METEOROLOGICAL AND SITE INFORMATION												
State of ground:		Dry		Moist	X	Wet		Snow		Frozen		
Wind:		Calm	X	Light		Moderate		Strong				
Cloud cover:		None		Slight	X	Cloudy		Overcast				
Preciptation:	X	None		Slight		Moderate		Heavy				
Barometric pressure (mbar):			1037	Before			1020	After				
Pressure Trend			x	Falling		Steady		Rising				

Key

CS	Hazard Potential	GSV (l/hr)	Additional Factors
CS1	Very Low	<0.07	Typically <1% CH4 and <5% CO2
CS2	Low	<0.70	Typical measured flow rate <70 l/h
CS3	Moderate	<3.5	N/A
CS4	Moderate to High	<15	N/A
CS5	High	<70	N/A
CS6	Very High	>70	N/A

Monitoring Point	FLOW DATA		GAS CONCENTRATIONS										WELL AND WATER DATA				RESPONSE ZONE	COMMENTS
	Flow rate (l/hr)		Methane (%v/v) CH4		Carbon dioxide (%v/v) CO2		Oxygen (%v/v) O2		Carbon monoxide (ppm) CO		Hydrogen sulphide (ppm) H2S		Water Depth (mbgl)	Depth of Well (mbgl)	Ground Level (mAOD)	Water Level (mAOD)		
	Peak	Steady	Peak	Steady	Peak	Steady	Lowest	Steady	Peak	Steady	Peak	Steady						
CP01	ND	ND	ND	ND	4.3	4.2	15.7	15.7	3	ND	ND	ND	1.29	9.37	43.73	42.44	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
CP02	-4.5	-0.1	ND	ND	0.8	0.7	21.1	21.3	1	1	ND	ND	0.88	9.52	42.80	41.92	Till	Flow rate measured for 570 seconds (9 minutes and 30 seconds).
CP03	9.6	0.1	ND	ND	1.7	1.7	13.6	13.6	ND	ND	ND	ND	3.24	9.78	45.23	41.99	Till	Flow rate measured for 680 seconds (11 minutes and 20 seconds).
CP04	ND	ND	ND	ND	0.4	0.3	21.1	21.7	ND	ND	ND	ND	0.91	9.07	41.98	41.07	Till	Flow rate measured for 80 seconds (1 minute and 20 seconds).
CP05	-1.9	-0.1	ND	ND	1.6	1.6	19.1	19.1	3	2	ND	ND	0.73	9.55	41.65	40.92	Till	Flow rate measured for 680 seconds (11 minutes and 20 seconds).Wa
CP06	ND	ND	ND	ND	0.6	0.2	20.9	22.1	ND	ND	ND	ND	1.00	9.37	41.43	40.43	Till	Flow rate measured for 60 seconds (1 minute).
CP07	ND	ND	ND	ND	5.4	5.4	2.7	2.7	ND	ND	ND	ND	1.22	9.83	40.56	39.34	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
CP08	ND	ND	ND	ND	4.4	4.4	13.5	13.5	2	ND	ND	ND	1.40	9.02	41.31	39.91	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
CP09	ND	ND	ND	ND	2.9	2.9	13.9	13.9	ND	ND	ND	ND	1.21	9.33	38.63	37.42	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
CP10	ND	ND	ND	ND	2.0	2.0	19.2	19.2	6	6	ND	ND	0.60	9.75	39.46	38.86	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds). Water
CP11	ND	ND	ND	ND	0.6	0.6	14.7	14.7	3	ND	ND	ND	1.45	9.56	37.57	36.12	Till	Flow rate measured for 150 seconds (2 minutes and 30 seconds).
CP12	-0.6	-0.1	ND	ND	1.4	1.2	15.4	15.6	3	1	ND	ND	1.38	8.91	38.12	36.74	Till	Flow rate measured for 410 seconds (6 minutes and 50 seconds).
CP13	-4.5	ND	ND	ND	0.8	0.5	20.0	21.7	ND	ND	ND	ND	0.97	9.21	38.41	37.44	Till	Flow rate measured for 130 seconds (2 minutes and 10 seconds).
CP14	ND	ND	ND	ND	3.2	3.2	0.9	0.9	ND	ND	ND	ND	1.13	8.90	36.52	35.39	Till	Flow rate measured for 80 seconds (1 minute and 20 seconds).
CP15	ND	ND	ND	ND	0.2	0.2	21.6	21.8	1	ND	ND	ND	1.29	8.31	36.32	35.03	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds). Fan st
CP16	-1.3	-0.2	ND	ND	1.4	0.6	17.2	20.7	ND	ND	ND	ND	1.37	8.82	34.70	33.33	Till	Flow rate measured for 360 seconds (6 minutes).
CP17	-8.7	-1.3	ND	ND	0.9	0.9	21.8	21.8	10	10	ND	ND	0.60	9.29	35.98	35.38	Till	Flow rate measured for 450 seconds (7 minutes and 30 seconds). Fan
CP18	ND	ND	ND	ND	1.5	1.5	21.3	21.3	18	17	ND	ND	1.01	9.81	36.35	35.34	Till	Flow rate measured for 90 seconds (1 minute and 30 seconds).
WS03	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	44.47		Till	Well flooded
WS04	-14.2	-0.4	ND	ND	3.4	3.4	5.2	5.2	3	ND	ND	ND	0.77	3.90	41.26	40.49	Till	Flow rate measured for 750 seconds (12 minutes and 30 seconds).
WS06	-0.1	ND	ND	ND	3.0	2.9	5.5	5.5	17	1	ND	ND	0.99	3.05	39.67	38.68	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
WS08	ND	ND	ND	ND	4.5	4.5	15.3	15.3	ND	ND	ND	ND	1.15	3.15	39.75	38.60	Till	Flow rate measured for 60 seconds (1 minute).
WS09	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	37.41		Till	Well flooded
WS12	ND	ND	ND	ND	0.2	0.2	21.8	22.3	ND	ND	ND	ND	1.10	3.08	35.24	34.14	Till	Flow rate measured for 70 seconds (1 minute and 10 seconds).
Min	0.1	0.1	0.1	0.1	0.2	0.2	0.9	0.9	ND	ND	ND	ND	0.60	3.05	34.70	33.33		
Max	9.6	0.1	0.1	0.1	5.4	5.4	21.8	22.3	18	17	ND	ND	3.24	9.83	45.23	42.44		

Borehole Hazardous Gas Flow Rates (l/hr)							
Peak Flow Rates				Steady Flow Rates			
CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)	CH4 Qhg (Peak)	CO2 Qhg (Peak)	CH4 Qhg (Steady)	CO2 Qhg (Steady)
0.0001	0.0043	0.0001	0.0042	0.0001	0.0043	0.0001	0.0042
-0.0045	-0.036	-0.0045	-0.0315	-0.0001	-0.0008	-0.0001	-0.0007
0.0096	0.1632	0.0096	0.1632	0.0001	0.0017	0.0001	0.0017
0.0001	0.0004	0.0001	0.0003	0.0001	0.0004	0.0001	0.0003
-0.0019	-0.0304	-0.0019	-0.0304	-0.0001	-0.0016	-0.0001	-0.0016
0.0001	0.0006	0.0001	0.0002	0.0001	0.0006	0.0001	0.0002
0.0001	0.0054	0.0001	0.0054	0.0001	0.0054	0.0001	0.0054
0.0001	0.0044	0.0001	0.0044	0.0001	0.0044	0.0001	0.0044
0.0001	0.0029	0.0001	0.0029	0.0001	0.0029	0.0001	0.0029
0.0001	0.002	0.0001	0.002	0.0001	0.002	0.0001	0.002
0.0001	0.0006	0.0001	0.0006	0.0001	0.0006	0.0001	0.0006
-0.0006	-0.0084	-0.0006	-0.0072	-0.0001	-0.0014	-0.0001	-0.0012
-0.0045	-0.036	-0.0045	-0.0225	0.0001	0.0008	0.0001	0.0005
0.0001	0.0032	0.0001	0.0032	0.0001	0.0032	0.0001	0.0032
0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002
-0.0013	-0.0182	-0.0013	-0.0078	-0.0002	-0.0028	-0.0002	-0.0012
-0.0087	-0.0783	-0.0087	-0.0783	-0.0013	-0.0117	-0.0013	-0.0117
0.0001	0.0015	0.0001	0.0015	0.0001	0.0015	0.0001	0.0015
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-0.0142	-0.4828	-0.0142	-0.4828	-0.0004	-0.0136	-0.0004	-0.0136
-0.0001	-0.003	-0.0001	-0.0029	0.0001	0.003	0.0001	0.0029
0.0001	0.0045	0.0001	0.0045	0.0001	0.0045	0.0001	0.0045
0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
0.0001	0.0002	0.0001	0.0002	0.0001	0.0002	0.0001	0.0002

APPENDIX G - PHOTOGRAPHS

Photo 1: TP07



Photo 2: TP16



Photo 3: TP01



Photo 3: TP06

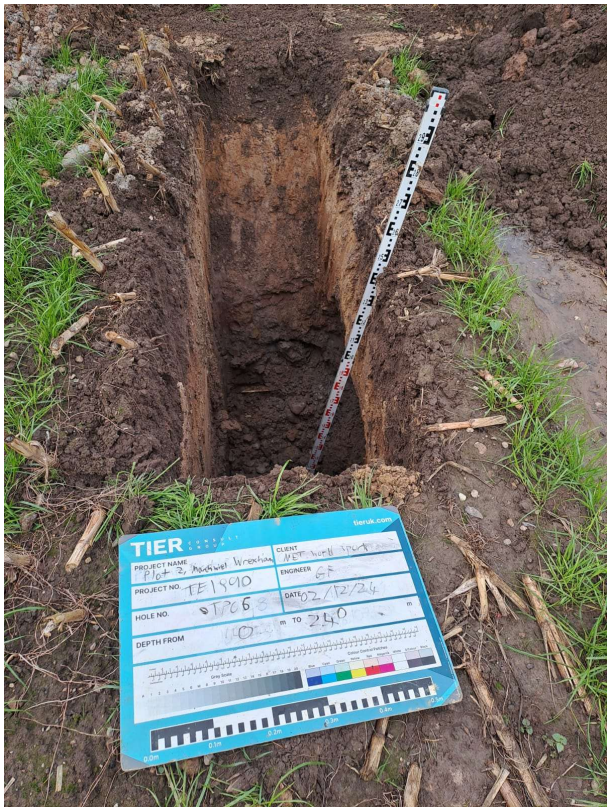


Photo 5: TP05



Photo 6: TP02



Photo 7: TP04



Photo 8: CP16



APPENDIX H - DEFINITIONS OF TERMS USED IN QUALITATIVE AND QUANTITATIVE RISK ASSESSMENTS

CIRIA C552 Terminology

For the qualitative and quantitative assessment of risks posed by potential pollutant linkages have been undertaken using the risk matrix adapted from CIRIA C552 and outlined in the table below.

	Category	Definition
Potential severity	Severe	Acute (short term) risk to human health, Major pollution of sensitive controlled waters, ecosystems or habitat. Catastrophic damage to buildings or property or crops.
	Medium	Chronic (Medium / long term) risk to human health Pollution of sensitive controlled waters, ecosystems or species, Significant damage to crops, buildings or structures
	Mild	Easily preventable permanent health effects on humans. Pollution of non-sensitive controlled waters. Minor damage to buildings or structures.
	Minor	Easily preventable non-permanent health effects on humans, or no effects. Minor, low level and localised contamination of on-site soil. Easily repairable damage to buildings or structures.
Probability of risk	High Likelihood	Pollutant linkage may be present, and the risk is almost certain to occur , or there is evidence of harm already occurring.
	Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
	Low Likelihood	Pollutant linkages may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
	Unlikely	Pollutant linkage may be present but the circumstances under which harm would occur are improbable.

		Potential Severity			
		Severe	**Medium**	**Mild**	**Minor**
Probability of risk	**High Likelihood**	Very high risk	High risk	Moderate risk	Moderate / low risk
	Likely	High risk	Moderate risk	Moderate / low risk	Low risk
	Low Likelihood	Moderate risk	Moderate / low risk	Low risk	Very low risk
	Unlikely	Moderate / low risk	Low risk	very low risk	Very low risk

APPENDIX I - HUMAN HEALTH ASSESSMENT CRITERIA

HUMAN HEALTH ASSESSMENT CRITERIA

Context

Contaminated Land is defined under law through Part IIA of the Environmental Protection Act 1990, implemented through Section 57 of the Environment Act 1995 and associated guidance ("Part IIA"). These specify that a "suitable for use" approach is to be applied in the assessment of potentially contaminated land, implemented through a phased programme of site investigation and risk assessment appropriate to the site under consideration.

The assessment of potential risks posed by contaminated land is based upon the assessment of plausible contaminant source - pathway - receptor linkages ("pollutant linkages") for the current and/or proposed future use of the site. The process for the assessment of contaminated land adopted in this report is in line with guidance issued by the Environment Agency Land contamination risk management (LCRM) - GOV.UK (www.gov.uk)

Land contamination can harm:

- human health
- drinking water supplies, groundwater and surface water
- soils
- ecosystems including wildlife, animals and wetlands.
- property

It can also affect the current and future land use. Dealing with land contamination helps make the environment clean and safe. Through regeneration it can:

- enhance the health and wellbeing of all.
- add to the economic, ecological and amenity value of the area.

Use land contamination risk management (LCRM) to:

- identify and assess if there is an unacceptable risk.
- assess what remediation options are suitable to manage the risk.
- plan and carry out remediation.
- verify that remediation has worked.

You can use LCRM in a range of regulatory and management contexts. For example, voluntary remediation, planning, assessing liabilities or under the Part 2A contaminated land regime. The Environment Agency expects you to follow LCRM if you are managing the risks from land contamination.

We support the use of the National Quality Mark Scheme (NQMS). You can use it for any type of land contamination report.

Using the NQMS:

- will make sure all legislative requirements and necessary standards related to managing land contamination are met.
- can provide increased confidence by submitting reports of the quality we expect.
- can result in cost and time savings by 'getting it right first time'.

LCRM is made up of 4 guides.

1. LCRM: Before you start.
2. LCRM: Risk assessment.
3. LCRM: Options appraisal.
4. LCRM: Remediation and verification.

We use a staged risk based approach. There are 3 stages, and each stage is broken down into tiers or steps.

Stage 1: Risk assessment

You will use a tiered approach to risk assessment. The 3 tiers are:

1. Preliminary risk assessment.
2. Generic quantitative risk assessment.
3. Detailed quantitative risk assessment.

Stage 1 includes information for intrusive site investigations.

Stage 2: Options appraisal

There are 3 steps to follow.

1. Identify feasible remediation options.
2. Do a detailed evaluation of options.
3. Select the final remediation option.

Stage 3: Remediation and verification

There are 4 steps to follow.

1. Develop a remediation strategy.
2. Remediate.
3. Produce a verification report.
4. Do long term monitoring and maintenance, if required

You must always start with a preliminary risk assessment.

The risk assessment stage is an iterative process. You can do the 3 tiers in order or progress from a preliminary risk assessment to a detailed quantitative risk assessment. As part of a generic or detailed quantitative risk assessment you will need to collect detailed information about the site. This is usually through an intrusive site investigation.

Depending on the level of risk or regulatory requirements, you can proceed from a preliminary risk assessment to the options appraisal stage. If you proceed direct to the options appraisal stage, you still need to collect the detailed site investigation information required by the generic and detailed quantitative risk assessments. This is to confirm that your approach is viable and acceptable.

Following the risk assessment stage, if you conclude that the risks are acceptable, with agreement from the relevant regulator, you can end the process.

If there are unacceptable risks, then remediation or mitigation is required. Follow stages 2 and 3 in order.

In stage 2 options appraisal, you will:

- look at the most feasible options.
- produce a shortlist of options.
- use evaluation criteria to assess them.
- select which ones are the most suitable to take forward to stage 3.

In stage 3 remediation and verification, you will produce a remediation strategy, do the remediation and then produce a verification report.

You will decide at the options appraisal stage if long term monitoring and maintenance is the remediation option. You may need to do post-remediation monitoring for further verification.

The risk assessment and subsequent investigation, remediation and verification must address all potential sources of pollutants that may be present on the site (the “hazards”), all receptors that may be harmed by these (e.g., human health, controlled waters, ecological receptors) and the pathways by which the contamination may be transported from the contaminant source(s) to the receptor(s). This is defined within the conceptual model for the site, which represents the characteristics of the site in a form that shows the possible pollutant linkages. As further information becomes available (for example, through site investigation), so the conceptual model will be refined.

Remedial action can be specified at any phase within this assessment process to break the identified pollutant linkage in determining whether or not to undertake further assessment or to undertake remediation, the potential cost-savings arising from a more thorough assessment of the pollutant linkages and more tightly defined remedial strategy must be considered against the direct costs involved in the work and the time that this will take to execute and gain regulatory approval.

A different approach to the statistical appraisal of data is required depending on whether the assessment is being undertaken to assess land as Contaminated Land in accordance with the regulations or whether the assessment is to assess whether the site is suitable for new development in accordance with the Planning regime. The statistical approach to assessment is discussed further in CL:AIRE:2020 “Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration”.

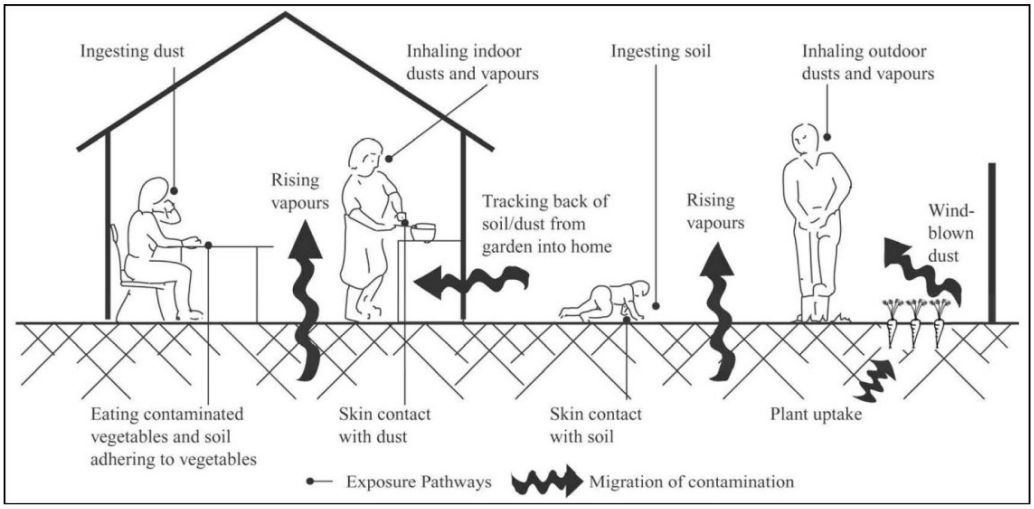
Some form of Detailed Quantitative Risk Assessment (DQRA) will be essential for those cases where appropriate GAC values cannot be established for the contaminant linkages under consideration.

Generic Assessment Criteria for Human Health Risk Assessment

In March 2002, the Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency (EA) published the Contaminated Land Exposure Assessment (CLEA) Model and a series of related reports and guidance. These were designed to provide a scientifically based framework for the assessment of chronic risks to human health from contaminated land. The initial documents (CLR7 – 10) were withdrawn and replaced with revised guidance issued by the Environment Agency including:

- "Using Soil Guideline Values"; EA,2009; Land contamination: using soil guideline values (SGVs) - GOV.UK (www.gov.uk)
- "Human Health toxicology assessment of contaminants in soil" EA;, 2009; https://www.gov.uk/government/publications/human-health-toxicological-assessment-of-contaminants-in-soil
- "Update technical background to the CLEA model" 2009; https://www.gov.uk/government/publications/updated-technical-background-to-the-clea-model
- CLEA Software (Version1.05) Handbook 2015; https://www.gov.uk/government/publications/contaminated-land-exposure-assessment-clea-tool
- Compilation of Data for priority Organic Contaminants for Derivation of Soil Guideline Values; Science Report SC050021/SR7, 2008; and,
- "Professional Guidance: Comparing Soil Contamination Data with a Critical Concentration". CL:AIRE:2020 https://www.claire.co.uk/component/phocadownload/category/9-other-cl-aire-documents?download=745:2020-stats-guidance

The CLEA model and associated guidance was developed to calculate an estimated tolerable daily intake (TDI) of contaminants for site users given a set of 'typical' human health exposure pathways which are detailed in "SR3: Updated technical background to the CLEA model"



(Science Report SC050021/SR3, EA, 2009) and reproduced below.

Ingestion

- Outdoor soil;
- Indoor dust;
- Home grown produce;
- Soil attached to home grown produce.

Dermal Contact

- Outdoor soil;
- Indoor dust.

Inhalation

- Outdoor dust;
- Indoor dust;
- Outdoor vapour;
- Indoor vapour.

It should be noted that the CLEA model does not include an exhaustive list of potential exposure pathways, e.g. certain compounds can pass through plastic water pipes into drinking water supply.

The potential significance of each of the exposure pathways is dependent upon the type of land use and the nature of the contaminant being considered. The CLEA model considers principal 'default' land use scenarios and makes a series of assumptions with regards to building type (where applicable), identification of the critical human receptor group, exposure frequency and duration. The definitions of the principal land use types given in SR3 (EA, 2009) are:

Residential land use;

- A typical residential property consisting of a two-storey terraced house built on a ground-bearing slab of 0.15m thickness with a private garden consisting of lawn, flowerbeds, and a small fruit and vegetable patch. The occupants are assumed to be parents with young children, who make regular use of the garden. The critical receptor is a 0 – 6-year-old female.
- Active exposure pathways are ingestion of outdoor soil, ingestion of indoor dust, ingestion of home grown produce and soil adhering to home grown produce; direct dermal contact with outdoor soil and indoor dust; inhalation of outdoor dust and vapour and indoor dust and vapour.

Allotments

- A plot of open space commonly made available by the Local Authority to tenants to grow fruit and vegetables for their own consumption. There are usually several plots to a site and the overall site area may cover more than one hectare. The tenants are assumed to be the parents or grandparents and that young children make occasional accompanied visits to the plots. The critical receptor is a 0 – 6-year-old female and there is no building present on site.
- Active exposure pathways are ingestion of outdoor soil, ingestion of home grown produce and soil adhering to home grown produce; direct dermal contact with outdoor soil; inhalation of outdoor vapour.

Commercial and industrial land use.

- A typical commercial or light industrial property consisting of a three-story office building (pre-1970) with a ground bearing floor slab at which employees spend most time indoors and are involved in office based or related light physical work. The critical receptor is a working female adult aged 16 – 65 years.
- Active exposure pathway is ingestion of outdoor soil, ingestion of indoor dust; direct dermal contact with outdoor soil and indoor dust; inhalation of outdoor dust and vapour and inhalation of indoor dust and vapour.

Soil Guideline Values

Based on the assumption of each land use type, the EA and DEFRA developed and published Soil Guideline Value (SGV) using the CLEA model for a number of principal contaminants and 'default' end-use scenarios of residential, allotments and commercial/industrial use. The primary purpose of the SGVs is as trigger value for the tolerable daily intake (TDI), below which it can be assumed that the soil does not pose an unacceptable risk to the identified receptor. Where soils contamination is present above this level further assessment may be required. SGVs were developed for the following contaminants:

- Heavy metals and other inorganic compounds: arsenic, cadmium, chromium, cyanide, lead (now withdrawn), mercury, nickel and selenium.
- Benzene, ethylbenzene, toluene and xylenes.
- Phenol.
- Dioxins and dioxin-like polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs) – 11 substances

LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment

In addition, in 2009 CIEH through LQM and EIC published generic assessment criteria (GACs) for 82 substances including metals, petroleum hydrocarbons, PAHs and explosive substances for a variety of soil types and the three 'default' land uses – (residential, allotments and commercial end-uses) as described in SR3 (EA, 2009). These have been superseded as described below.

Category 4 Screening Values

In 2013 "SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination" (CL:AIRE 2013) was issued which detailed findings of a research project undertaken by CL:AIRE to set out the framework by which potential Category 4 Screening Levels (pC4SL) may be derived for 6 contaminants of concern, Arsenic, Benzene, Benzo(a)pyrene, Cadmium, Chromium VI and Lead.

This was supplemented in 2014 by "SP1010: Development of Category 4 Screening Levels for the Assessment of Land Affected by Contamination – Policy Companion Document" (DEFRA, 2014). SP1010 proposed several updated toxicology information relating to contaminant behaviour updated assumptions relating to the modelling of human exposure to soil contaminants, derivation of separate C4SLs for residential with the consumption of home grown produce, residential without the consumption of home grown produce, and two new land uses: public open spaces near residential housing (POS resi) and public parks (POS park).

Public Open Space: Residential

- For public open space in close proximity to residential housing and the central green area around which houses are located, as on many housing estates from the 1930s to 1970s. It is also applicable for smaller areas commonly incorporated in newer developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soil with planting. It is considered to be a generally grassed area up to 0.5ha with up to 50% bare soil. The land use is an important resource

for children and the area is near the homes. The critical receptor is a female child age >3 - <9 years old (CLEA age class 4 – 9) as younger children are unlikely to play outdoors unsupervised.

- Active exposure pathways are ingestion of outdoor soil, ingestion of indoor dust; direct dermal contact with outdoor soil and indoor soil derived dust; inhalation of outdoor and indoor dust and inhalation of outdoor vapour.

Public Open Space: Park

- A public park is defined as an area of open space provided for recreational use and usually owned and maintained by the Local Authority. It is anticipated the park could be used for a wide range of activities, including the following:
    - Family visits and picnics;
    - Children's play area;
    - Sporting activities such as football on an informal basis (i.e. not a dedicated sports pitch); and
    - Dog walking.
- The park is modelled as an area >0.5 ha of predominantly grasses open space with no more than 25% of exposed soil.
- The critical receptor is a female child with CLEA age classes 1 – 6.
- Active exposure pathways are: ingestion of outdoor soil; direct dermal contact with outdoor soil; inhalation of outdoor dust and inhalation of outdoor vapour.

Furthermore, the C4SLs are based on a different toxicological benchmark, the 'low level of toxicological concern' (LLTC). This difference in approach was adopted because the C4SLs were primarily intended for use under Part2A of the EPA 1990 to quickly screen out Category 4 sites where there is "*no risk or that the level of risk posed is low*". SGVs and LQM GACs are based on the more conservative 'minimal or tolerable level of risk' as defined in SR2 (EA, 2009) and were derived for assessment of contamination for the Planning process.

LQM/CIEH Suitable 4 Use Levels (S4ULs)

The publication of the C4SLs resulted in considerable and inconclusive debate about the applicability of the lower level of protection of the C4SL, which are underlain by the LLTC, outside of the Part 2A context for which they were derived. In 2014 LQM/CIEH presented a Suitable 4 Use Levels (S4ULs), which incorporate the updated assumption exposure derived for the production of the C4SLs but within the context of deriving screening criteria above which further assessment of the risks or remedial action may be needed. The S4ULs replace the 82 substances, species and fractions and congeners contained in the previous LQM/CIEH GACs issued in 2009. Additionally, following changes and new land uses proposed in the C4SL research project, S4ULs have also been derived for the majority of substances for which the EA derived SGVs in 2009 with the exception of lead (see below).

Lead

The C4SL for lead provides a technically robust and conservative assessment tool using significantly updated toxicological modelling than the withdrawn SGV and derived in line with current science of lead toxicology.

EIC/AGS/CL:AIRE Soil Generic Assessment Criteria (2010)

In some instances, EIC/AGC/CL:AIRE GACs for certain VOC / SVOC potential contaminants of concern have been used *in lieu* of available LQM / CIEH S4UL values.

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Metals/metalloids																			
Arsenic	37			40			43			640			79			170			LQM (2014)
Beryllium	1.7			1.7			35			12			2.2			63			LQM (2014)
Boron	290			11000			45			240000			21000			46000			LQM (2014)
Cadmium	11			85			1.9			190			120			532			LQM (2014)
Chromium III	910			910			18000			8600			1500			33000			LQM (2014)
Chromium VI	6			6			1.8			33			7.7			220			LQM (2014)
Copper	2400			7100			520			68000			12000			44000			LQM (2014)
Lead	200			310			80			2330			630			1300			C4SL
Mercury (elemental)	1.2			1.2			21			58 (25.8)			16			30 (25.8)			LQM (2014)
Mercury (Inorganic)	40			56			19			1100			120			240			LQM (2014)
Methylmercury	11			15			6			320			40			68			LQM (2014)
Nickel	180			180			230			980			230			3400			LQM (2014)
Selenium	250			430			88			12000			1100			1800			LQM (2014)
Vanadium	410			1200			91			9000			2000			5000			LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Zinc	3700			40000			620			730000			81000			170000			LQM (2014)
Other																			
Total Sulphate	2,400			2,400			2,400			2,400			2,400			2,400			BRE (2005)
Water Soluble Sulphate (g/l)	0.5			0.5			0.5			0.5			0.5			0.5			BRE (2005)
PAHs																			
Acenaphthene	210	510	1100	3000 (57)	4700(141)	6000 (336)	34	85	200	84000 (57)	97000 (141)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Acenaphthylene	170	420	920	2900 (86.1)	4600 (212)	6000 (506)	28	69	160	8300 (86.1)	97000 (212)	100000	15000	15000	15000	29000	30000	30000	LQM (2014)
Anthracene	2400	5400	11000	31000 (1.17)	35000	37000	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000	LQM (2014)
Benzo(a)anthracene	7.2	11	13	11	14	15	2.9	6.5	13	170	170	180	29	29	29	49	56	62	LQM (2014)
Benzo(a)pyrene	2.2	2.7	3	3.2	3.2	3.2	0.97	2	3.5	35	35	36	5.7	5.7	5.7	11	12	13	LQM (2014)
Benzo(b)fluoranthene	2.6	3.3	3.7	3.9	4	4	0.99	2.1	3.9	44	44	45	7.1	7.1	7.1	13	15	16	LQM (2014)
Benzo(g,h,i)perylene	320	340	350	360	360	360	290	470	640	3900	4000	4000	640	640	640	1400	1500	1600	LQM (2014)
Benzo(k)fluoranthene	77	93	100	110	110	110	37	75	130	1200	1200	1200	190	190	190	370	410	440	LQM (2014)
Chrysene	15	22	27	30	31	32	4.1	9.4	19	350	350	350	57	57	57	93	110	120	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Dibenz(a,h)anthracene	0.24	0.28	0.3	0.31	0.32	0.32	0.14	0.27	0.61	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4	LQM (2014)
Fluoranthene	280	560	890	1500	1600	1600	52	130	290	23000	23000	23000	3100	3100	3100	63	6300	6400	LQM (2014)
Fluorene	170	400	860	2800 (30.9)	3800 (76.5)	4500 (183)	27	67	160	63000 (30.9)	68000	71000	9900	9900	9900	20000	20000	20000	LQM (2014)
Indeno(1,2,3-cd)pyrene	27	36	41	45	46	46	9.5	21	39	500	510	510	82	82	82	150	170	180	LQM (2014)
Naphthalene	2.3	5.6	13	2.3	5.6	13	4.1	10	24	190 (76.4)	460 (183)	1100 (432)	4900	4900	4900	1200 (76.4)	1900 (183)	3000	LQM (2014)
Phenanthrene	95	220	440	1300 (36)	1500	1500	15	38	90	22000	22000	23000	3100	3100	3100	6200	6200	6300	LQM (2014)
Pyrene	620	1200	2000	3700	3800	3800	110	270	620	54000	54000	54000	7400	7400	7400	15000	15000	15000	LQM (2014)
Coal Tar (BaP as surrogate marker)	0.79	0.98	1.1	1.2	1.2	1.2	0.32	0.67	1.2	15	15	15	2.2	2.2	2.2	4.4	4.7	4.8	LQM (2014)
BTEX and TPH																			
Benzene	0.087	0.17	0.37	0.38	0.7	1.4	0.017	0.034	0.075	27	47	90	72	72	73	90	100	110	LQM (2014)
Toluene	130	290	660	880 vap (869)	1900	3900	22	51	120	56000 vap (869)	110000 vap (1920)	180000 vap (4360)	56000	56000	56000	87000 vap (869)	95000 vap (1920)	100000 vap (4360)	LQM (2014)
Ethylbenzene	47	110	260	83	190	440	16	39	91	5700 vap (518)	13000 vap (1220)	27000 vap (2840)	24000	24000	25000	17000 vap (518)	22000 vap (1220)	27000 vap (2840)	LQM (2014)
Xylene - o	60	140	330	88	210	480	28	67	160	6600 (478)	15000 (1120)	33000 (2620)	41000	42000	43000	17000 (478)	24000 (1120)	33000 (2620)	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Xylene - m	59	140	320	82	190	450	31	74	170	6200 (625)	14000 (1470)	31000 (3460)	41000	42000	43000	17000 (625)	24000 (1470)	32000 (3460)	LQM (2014)
Xylene - p	56	130	310	79	180	430	29	69	160	5900 (576)	14000 (1350)	30000 (3170)	41000	42000	43000	17000 (576)	23000 (1350)	31000 (3170)	LQM (2014)
Aliphatic EC 5-6	42	78	160	42	78	160	730	1700	3900	3200 (304)	5900 (558)	12000 (1150)	570000 (304)	590000	600000	95000 (304)	130000 (558)	180000 (1150)	LQM (2014)
Aliphatic EC >6-8	100	230	530	100	230	530	2300	5600	13000	7800 (144)	17000 (322)	40000 (736)	600000	610000	620000	150000 (144)	220000 (322)	320000 (736)	LQM (2014)
Aliphatic EC >8-10	27	65	150	27	65	150	320	770	1700	2000 (78)	4800 (190)	11000 (451)	13000	13000	13000	14000 (78)	18000 (190)	21000 (451)	LQM (2014)
Aliphatic EC >10-12	130 (48)	330 (118)	760 (283)	130 (48)	330 (118)	760 (283)	2200	4400	7300	9700 (48)	23000 (118)	47000 (283)	13000	13000	13000	21000 (48)	23000 (118)	24000(283)	LQM (2014)
Aliphatic EC >12-16	1100 (24)	2400 (59)	4300 (142)	1100 (24)	2400 (59)	4300 (142)	11000	13000	13000	59000 (24)	82000 (59)	90000 (142)	13000	13000	13000	25000 (24)	25000 (59)	26000 (142)	LQM (2014)
Aliphatic EC >16-35	65000 (8.48)	92000 (21)	110000	65000 (8.48)	92000 (21)	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aliphatic EC >35-44	65000 (8.48)	92000 (21)	110000	65000 (8.48)	92000 (21)	110000	260000	270000	270000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000	LQM (2014)
Aromatic EC 5-7	70	140	300	370	690	1400	13	27	57	26000 (1220)	46000 (2260)	86000 (4710)	56000	56000	56000	76000 (1220)	84000 (2260)	92000 (4710)	LQM (2014)
Aromatic EC >7-8	130	290	660	860	1800	3900	22	51	120	56000 (869)	110000 (1920)	180000 (4360)	56000	56000	56000	87000 (869)	95000 (1920)	100000 (4360)	LQM (2014)
Aromatic EC >8-10	34	83	190	47	110	270	8.6	21	51	3500 (613)	8100 (1500)	17000 (3580)	5000	5000	5000	7200 (613)	8500 (1500)	9300 (3580)	LQM (2014)
Aromatic EC >10-12	74	180	380	250	590	1200	13	31	74	16000 (364)	28000 (899)	34000 (2150)	5000	5000	5000	9200 (364)	9700 (899)	10000	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Aromatic EC >12-16	140	330	660	1800	2300 (419)	2500	23	27	130	36000 (169)	37000	38000	5100	5100	5000	10000	10000	10000	LQM (2014)
Aromatic EC >16-21	260	540	930	1900	1900	1900	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800	LQM (2014)
Aromatic EC >21-35	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
Aromatic EC >35-44	1100	1500	1700	1900	1900	1900	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
Aromatic EC >44-75	1600	1800	1900	1900	1900	1900	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900	LQM (2014)
VOCs																			
1,2-dichloroethane (1,2-DCA)	0.0071	0.011	0.019	0.0092	0.013	0.023	0.0046	0.0083	0.016	0.67	0.97	1.7	29	29	29	21	24	28	LQM (2014)
1,1,1-trichloroethane	8.8	18	39	9	18	40	48	110	240	660	1300	3000	140000	140000	140000	57000 (1425)	76000 (2915)	100000 (6392)	LQM (2014)
1,1,2,2,tetrachloroethane	1.6	3.4	7.5	3.9	8	17	0.41	0.89	2	270	550	1100	1400	1400	1400	1800	2100	2300	LQM (2014)
tetrachloroethene	0.18	0.39	0.9	0.18	0.4	0.92	0.65	1.5	3.6	19	45	95	1400	1400	1400	810 (424)	1100 (951)	1500	LQM (2014)
tetrachloromethane (Carbon tetrachloride)	0.026	0.056	0.13	0.026	0.056	0.13	0.45	1	2.4	2.9	6.3	14	890	920	950	190	270	400	LQM (2014)
Trichloroethene	0.016	0.034	0.075	0.017	0.036	0.08	0.041	0.091	0.21	1.2	2.6	5.7	120	120	120	70	91	120	LQM (2014)
Trichloromethane (chloroform)	0.91	1.7	3.4	1.2	2.1	4.2	0.42	0.83	1.7	99	170	350	2500	2500	2500	2600	2800	3100	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Chloroethene (Vinyl chloride)	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.00055	0.001	0.0018	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4	LQM (2014)
2,4,6 Trinitrotoluene (TNT)	1.6	3.7	8.1	65	66	66	0.24	0.58	1.4	1000	1000	1000	130	130	130	260	270	270	LQM (2014)
RDX	120	250	540	13000	13000	13000	17	38	85	210000	210000	210000	26000	26000	27000	49000 (18.7)	51000	53000	LQM (2014)
HMX	5.7	13	26	6700	6700	6700	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	23000 (0.35)	23000 (0.39)	24000 (0.48)	LQM (2014)
Aldrin	5.7	6.6	7.1	7.3	7.4	7.5	3.2	6.1	9.6	170	170	170	18	18	18	30	31	31	LQM (2014)
Dieldrin	0.97	2	3.5	7	7.3	7.4	0.17	0.41	0.96	170	170	170	18	18	18	30	30	31	LQM (2014)
Atrazine	3.3	7.6	17.4	610	620	620	0.5	1.2	2.7	9300	9400	9400	1200	1200	1200	2300	2400	2400	LQM (2014)
Dichlovos	0.032	0.066	0.014	6.4	6.5	6.6	0.0049	0.01	0.022	140	140	140	16	16	16	26	26	27	LQM (2014)
Alpha-Endosulfan	7.4	18	41	160 (0.003)	280 (0.007)	410 (0.016)	1.2	2.9	6.8	5600 (0.003)	7400 (0.007)	8400 (0.016)	1200	1200	1200	2400	2400	2500	LQM (2014)
alpha-Hexachlorocyclohexane	0.23	0.55	1.2	6.9	9.2	11	0.035	0.087	0.21	170	180	180	24	24	24	47	48	48	LQM (2014)
beta-hexachlorocyclohexanes	0.085	0.2	0.46	3.7	3.8	3.8	0.013	0.032	0.077	65	65	65	8.1	8.1	8.1	15	15	16	LQM (2014)
gamma-hexachlorocyclohexanes	0.06	0.14	0.33	2.9	3.3	3.5	0.0092	0.023	0.054	67	69	70	8.2	8.2	8.2	14	15	15	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Chlorobenzene	0.46	1	2.4	0.46	1	2.4	5.9	14	32	56	130	290	11000	13000	14000	1300 (675)	2000 (1520)	2900	LQM (2014)
1,2-Dichlorobenzene	23	55	130	24	57	130	94	230	540	2000 (571)	4800 (1370)	11000 (3240)	90000	95000	98000	24000 (571)	36000 (1370)	51000 (3240)	LQM (2014)
1,3-Dichlorobenzene	0.4	1	2.3	0.44	1.1	2.5	0.25	0.6	1.5	30	73	170	300	300	300	390	440	470	LQM (2014)
1,4-Dichlorobenzene	61	150	350	61	150	350	15	37	88	4400 (224)	10000 (540)	25000 (1280)	17000	17000	17000	36000 (224)	36000 (540)	36000 (1280)	LQM (2014)
VOCs Continued																			
1,2,3-Trichlorobenzene	1.5	3.6	8.6	1.5	3.7	8.8	4.7	12	28	102	250	590	1800	1800	1800	770 (134)	1100 (330)	1600 (789)	LQM (2014)
1,2,4-Trichlorobenzene	2.6	6.4	15	2.6	6.4	15	55	140	320	220	530	1300	15000	17000	19000	1700 (318)	2600 (786)	4000 (1880)	LQM (2014)
1,3,5-Trichlorobenzene	0.33	0.81	1.9	0.33	0.81	1.9	4.7	12	28	23	55	130	1700	1700	1800	380 (36.7)	580 (90.8)	860 (217)	LQM (2014)
1,2,3,4-Tetrachlorobenzene	15	36	78	24	56	120	4.4	11	26	1700 (122)	3080 (304)	4400 (728)	830	830	830	1500 (122)	1600	1600	LQM (2014)
1,2,3,5-Tetrachlorobenzene	0.66	1.6	3.7	0.75	1.9	4.3	0.38	0.9	2.2	49 (39.4)	120 (98.1)	240 (235)	78	79	79	110 (39)	120	130	LQM (2014)
1,2,4,5-Tetrachlorobenzene	0.33	0.77	1.6	0.73	1.7	3.5	0.06	0.16	0.37	42 (19.7)	72 (49.1)	96	13	13	13	25	26	26	LQM (2014)
Pentachlorobenzene	5.8	12	22	19	30	38	1.2	3.1	7	640 (43)	770 (107)	830	100	100	100	190	190	190	LQM (2014)

Parameter	Residential with homegrown produce			Residential without homegrown produce			Allotment			Commercial / Industrial			Public Open Space near Residential			Public Open Space - Park			Source
	(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			(mg/kg, unless otherwise stated)			
SOM	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	**1%**	**2.50%**	**6%**	
Hexachlorobenzene	1.8 (0.2)	3.3 (0.5)	4.9	4.1 (0.2)	5.7 (0.5)	6.7 (1.2)	0.47	1.1	2.5	110 (0.2)	120	120	16	16	16	30	30	30	LQM (2014)
Phenol	280	550	1100	750	1300	2300	66	140	280	760 dir (31000)	1500 dir (35000)	3200 dir (37000)	760 dir (31000)	1500 dir (35000)	3200 dir (37000)	760 dir (31000)	1500 dir (35000)	3200 dir (37000)	LQM (2014)
Chlorophenols (excluding pentachlorophenol)	0.87 (g)	2	4.5	94	150	210	0.13 (g)	0.3	0.7	3500	4000	4300	620	620	620	1100	1100	1100	LQM (2014)
Pentachlorophenol	0.22	0.52	1.2	27 (16.4)	29	31	0.03	0.08	0.19	400	400	400	60	60	60	110	120	120	LQM (2014)
Carbon Disulphide	0.14	0.29	0.62	0.14	0.29	0.62	4.8	10	23	11	22	47	11000	11000	12000	1300	1900	2700	LQM (2014)
Hexachlorobutadiene	0.29	0.7	1.6	0.32	0.78	1.8	0.25	0.61	1.4	31	66	120	25	25	25	48	50	51	LQM (2014)

(g) derived based on 2,3,4,6-tetrachlorophenol; dir - based on a threshold protective of direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustration only); (vap) calculated for vapour phase only. SOM – Soil Organic Matter; (4.5) solubility.

APPENDIX J - CONTROLLED WATERS RISK ASSESSMENT

CURRENT GUIDANCE FOR CONTROLLED WATERS RISK ASSESSMENT

Regulatory Context

Government policy is based upon a "suitable for use approach," which is relevant to both the current use of land and also to any proposed future use. When considering the current use of land, Part IIA of the Environment Protection Act 1990 (EPA 1990) provides the regulatory regime, which was introduced by Section 57 of the Environment Act 1995, which came into force in England on 1 April 2000. The main objective of introducing the Part IIA regime is to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health, controlled waters or the wider environment given the current use and circumstances of the land. Part IIA provides a statutory definition of contaminated land under Section 78A(2) as:

> *"any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land, that:*
>
> *(a) Significant harm is being caused or there is a significant possibility of such harm being caused; or*
>
> *(b) Pollution of controlled waters is being, or is likely to be, caused."*

Part IIA provides a statutory definition of the pollution of controlled waters under Section 78A(9) as:

> *"the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter"*

Controlled Waters are defined Section 104 of the Water Resources Act 1991. In summary, the comprise relevant territorial waters which extend seaward for three miles from the low-tide limit from which the territorial sea adjacent to England and Wales is measured.

The Environment Agency has powers under Part 7 of The Water Resources Act (1991) to take action to prevent or remedy the pollution of controlled waters, including circumstances where the pollution arises from contamination in the land. This is reinforced in The Contaminated Land (England) (Amendment) Regulations 2012 and Contaminated Land Statutory Guidance (DEFRA, 2012) which came into force in early April 2012.

Part IIA introduces the concept of a contaminant linkage; where for potential harm to exist there must be a connection between the source of the hazard and the receptor via a pathway. Risk assessment in contaminated land is therefore directed towards identifying the contaminants, pathways and receptors that can provide contaminant linkages. This is known as the contaminant-pathway-receptor link (CPR or contaminant linkage).

Part IIA places contaminated land responsibility as a part of the planning and redevelopment process, rather than Local Authority or Environment Agency directly, except in cases of very high pollution risk or where harm is occurring. In the planning process, guidance is provided by National Planning Policy Framework (NPPF) of March 2012. The NPPF requires that a site which has been developed shall not be capable of being determined "contaminated land" under Part IIA. Therefore, appropriate risk-based investigation is required to identify the contaminant linkages that can then be assessed, and then mitigated using methods that can be agreed with the planners.

Source Protection Zones

Source Protection Zones (SPZs) are defined by the Environment Agency (for England and Wales), SEPA (Scotland) and the Environment and Heritage Service (Northern Ireland) for groundwater sources such as wells, boreholes and springs that are used for public drinking water supply. The zones show the risk of contamination from activities that might cause groundwater pollution in the area. The size and shape of a zone depends upon subsurface conditions, how the groundwater is removed, and other environmental factors.

SPZs are classified into four categories:

- **Zone 1 (Inner protection zone).** Any pollution that can travel to the abstraction point within 50 days from any point within the zone is classified as being inside Zone 1. This applies at and below the groundwater table. This zone also has a minimum 50m protection radius around the abstraction point. These criteria are designed to protect against the transmission of toxic chemicals and water-borne disease.
- **Zone 2 (Outer protection zone).** The outer zone covers pollution that takes up to 400 days to travel to the abstraction point, or 25% of the total catchment area, whichever area is the largest. This travel time is the minimum period over which the Environment Agency considers that pollutants need to be diluted, reduced in strength or delayed by the time they reach the abstraction point.
- **Zone 3 (Total catchment).** This is the total area needed to support removal of water from the abstraction point, and to support any discharge from this.
- **Zone of special interest.** This may occasionally be defined as a special case. This is usually where local conditions mean that industrial sites and other potential sources of contamination could affect the groundwater source, even though they are outside the normal catchment area.

Groundwater Vulnerability Assessments

From 1 April 2010 The Environment Agency Groundwater Protection Policy began to use aquifer designations which are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The aquifer designation data is based on geological mapping provided by the British Geological Survey. It is updated regularly to reflect their ongoing programme of improvements to these maps. The maps are split into two different type of aquifer designation:

- Superficial (Drift) - permeable unconsolidated (loose) deposits. For example, sands and gravels.
- Bedrock -solid permeable formations e.g. sandstone, chalk and limestone.

The maps display the following aquifer designations:

Table 1. Aquifer Classification ("Geological Classification").

Classification	Definition
Principal Aquifers (Highly Permeable)	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
Secondary A Aquifers	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.
Secondary B Aquifers	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
Secondary Undifferentiated Aquifers	This has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Environment Agency Guidance

The Environment Agency's stance on groundwater resources is:

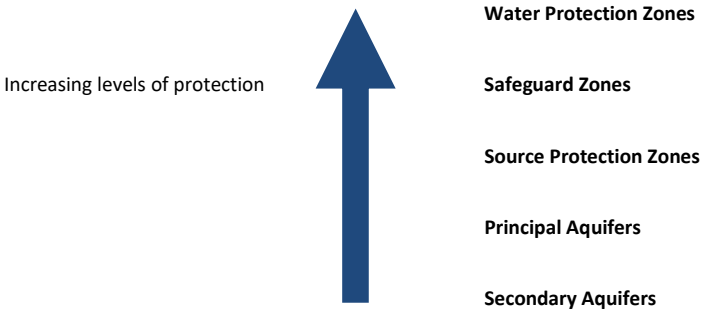
> *"to protect and manage groundwater resources for present and future generations in ways that are appropriate for the risks we identify"* (Groundwater Protection: Policy and Practice GP3, 2012).

At present, the legislation and guidance pertaining to the protection of controlled waters in the UK is complex; however, the core objectives seek to enforce the position given above.

In 1992, the National Rivers Authority published their Policy and Practice for the Protection of Groundwater (PPPG), this document introduced areas of focus for developments such as Source Protection Zones (SPZs) and Groundwater Vulnerability Maps. The Policy was revised in 1998, since which there have been substantial changes in legislation, driven by key European Directives relating to groundwater include the Groundwater Directive (80/68/EEC) and the Water Framework Directive (2000/60/EC). Aspects of these directives are controlled by primary UK legislation such as the Water Resources Act 1991 as amended by the Water Act 2003. Gaps in the 1998 PPPG that emerged as the result of further legislative changes were addressed in the Environment Agency Policy document Groundwater Protection: Policy and Practice (GP3), Version 1 of November 2012. The three main parts of GP3 were:

- Groundwater principals;
- Position statements and legislation; and
- Technical information.

The Environment Agency has a tiered risk based approach to drinking water protection as summarised below:



Controlled Waters Risk Assessment

A number of tools are available (as detailed in GP3) in order for a developer of a potentially contaminated site to fulfil their obligations under the legislation. A site assessment would be required in order to identify any potential risks to controlled waters and to derive suitable clean up criteria, if required, to ensure the protection of controlled waters.

There are three main stages to any risk assessment of controlled waters:

1. Risk Screening (devise Conceptual Site Model, making reference to groundwater vulnerability maps, site setting, controlled waters context etc)
2. Generic Risk Assessment (EA Remedial Targets Methodology Tier 1 / Comparison of groundwater data with relevant standards)
3. Detailed Quantitative Risk Assessment (Consideration of aquifer properties and site specific parameters, EA Remedial Targets Methodology Tiers 2 & 3)

Risk Screening

Here, the Conceptual Site Model (CSM) is a critical tool to assessing any potentially contaminated site. The information from a robust CSM can be used to establish any pathways or receptors that do not require further assessment at an early stage. For example, it may be possible to confirm the absence of a particular sensitive controlled water receptor (such as a surface water feature) within the vicinity of the site thereby breaking the associated source-pathway-receptor pollutant linkage. Information from subsequent tiers of risk assessment, such as following intrusive investigations, are used to update the CSM accordingly.

Generic Risk Assessment - England and Wales

When undertaking the Generic Hydrogeological Risk Assessment (EA Remedial Targets Methodology Tier 1), comparison of chemical analytical results is made with those screening criteria.

In accordance with Part 2A of the Environmental Protection Act 1990, Tier Environmental has made regard to all of the Water Quality Standards (WQS) that are relevant to the specific site and a judgment has been made against the most stringent of those relevant standards:

- EQS Directive 2008/105/EC
- Priority Substances Directive 2013/39/EU
- Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
- UK Drinking Water Standards (UK DWS)
- World Health Organisation (WHO Guidelines) for Drinking Water Quality
- Council Directive 98/83/EC on the quality of water intended for human consumption (Drinking water directive)

In some instances, the laboratory method detection limit is greater than the appropriate EQS/UKDWS value. In these instances, only measured concentrations in excess of the laboratory method detection limit have been considered likely to potentially represent a possible significant risk to controlled waters.

Please note that there is no quantitative criterion for total petroleum hydrocarbons (TPH), or speciated TPH fractions. Historically, standards provided for petroleum hydrocarbons ranges from 10µg/l (Private Water Supply Regulations 1991, removed from the 2009 regulations) to 50µg/l-1000µg/l (Surface Waters (Abstraction for Drinking Water) Regulations 1989) which related to the degree of treatment of water prior to use as drinking water. Over time, the legislative standards have been rescinded and no alternative standard provided, although the Environment Agency planned to release speciated TPH criteria (Fretwell et al., 2009).

In order to assess whether there is a potentially unacceptable risk of pollution of controlled waters, the results of the groundwater chemical analysis for TPH and BTEX were evaluated against Water Quality Standards (WQS) appropriate to the conceptual model for the site:

Table 2. Summary of Selected TPH and BTEX Water Quality Standards Selected for Tier 1 Screening

Determinand	Units	WQS Selected	Source of WQS
Aliphatics >C5-C6	µg/l	15000	Table 5.4 of CL:AIRE 2017#
Aliphatics >C6-C8	µg/l	15000	Table 5.4 of CL:AIRE 2017#
Aliphatics >C8-C10	µg/l	300	Table 5.4 of CL:AIRE 2017#
Aliphatics >C10-C12	µg/l	300	Table 5.4 of CL:AIRE 2017#
Aliphatics >C12-C16	µg/l	300	Table 5.4 of CL:AIRE 2017#
Aliphatics >C16-C21	µg/l	-	Table 5.4 of CL:AIRE 2017#
Aliphatics >C21-C35	µg/l	-	Table 5.4 of CL:AIRE 2017#
Aromatics >C5-EC7	µg/l	10	Table 5.4 of CL:AIRE 2017#
Aromatics >EC7-EC8	µg/l	700	Table 5.4 of CL:AIRE 2017#
Aromatics >EC8-EC10	µg/l	300	Table 5.4 of CL:AIRE 2017#
Aromatics >EC10-EC12	µg/l	100	Table 5.4 of CL:AIRE 2017#

Aromatics >EC12-EC16	µg/l	100	Table 5.4 of CL:AIRE 2017#
Aromatics >EC16-EC21	µg/l	90	Table 5.4 of CL:AIRE 2017#
Aromatics >EC21-EC35	µg/l	90	Table 5.4 of CL:AIRE 2017#
Benzene	µg/l	10	Priority Substance Water Framework Directive 2015 and Table 5.3 of CL:AIRE 2017#
Toluene	µg/l	74	Table 1 Water Framework Directive 2015 and Table 5.3 of CL:AIRE 2017#
Ethylbenzene	µg/l	20	R&D Technical Report P2-115/TR4, 2002
Total xylenes	µg/l	30	DoE (1997c) Hedgecott S. and Lewis S, An update on proposed environmental quality standards for xylenes in water, final report to the Department of the Environment. Report No. DoE 4273/1. Medmenham: WRc; and; Table 5.3 of CL:AIRE 2017#

Notes - # = CL:AIRE document 'Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies' (ISBN 978-1-905046-31-7, dated 2017),

Table 5.3 was referenced in the first instance from the CL:AIRE document 'Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies' (ISBN 978-1-905046-31-7, dated 2017), the to select appropriate Freshwater EQS values for benzene, toluene and total xylenes. The selected value for Ethylbenzene was derived from the proposed EQS value of 20µg/l from the Environment Agency R&D Technical Report P2-115/TR4, 2002. This represents a more conservative value than the 300µg/l value in Table 5.3.

With respect to speciated TPH CWG fractions, Table 5.3 states and refers the reader to 'See Table 5.4'. On this basis, Tier Environmental selected the World Health Organization (WHO) guide values for TPHCWG fractions in drinking water that are presented in Table 5.4 which may be considered appropriately protective of the controlled waters environment based on the conceptual site model.

Generic Risk Assessment is generally undertaken via comparison of reported leachate and/or groundwater concentrations against selected assessment criteria for the potential contaminants of concern identified for the site from a preliminary desk based assessment.

The selected Generic Assessment Criteria (GAC) derived from a Water Quality Standard (WQS) for any specific substance may not necessarily be a simple number and can often be found to be expressed as:

- Annual mean concentration;
- Maximum allowable concentration;
- 95th percentile concentration for *n* samples;
- Total concentration;
- Dissolved concentration (applicable to filtered samples)

The values may sometimes be expressed for individual substances (e.g. arsenic or for groups of substances e.g. total xylenes or sums of certain PAHs).

Environmental Quality Standards (EQS) have been used where available for Priority Substances and Priority Hazardous Substances set at a European level:

- Priority Substances Directive 2013/39/EU;
- Amending 2008/105 and 2000/118/EC

In addition, EQS values derived for Specific Pollutants have been used as presented in The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

For assessing risks to potable water abstraction supplies, UK Drinking Water Standards presented in the Water Supply (Water Quality) Regulations 2000 (SI/2000/3184) (as amended) have been applied.

In selecting a GAC for a particular site, Tier Environmental considers the following factors:

- Current use/function of the groundwater (e.g. drinking water, irrigation water, industrial use, base-flow to rivers and streams);
- Plausible, proposed or planned future uses of the water and nearby waters;
- Sensitivity of the critical receptor (e.g. human health, aquatic life); and,
- Requirements to trigger action under the legal context.

In accordance with Part 2A:

> *"in deciding whether pollution of controlled waters is occurring, the assessor will have regard to all of the water quality standards that are relevant to the specific site and make a judgment against the most stringent of those relevant standards."*

Should the Level 1 or 2 assessments indicate threshold levels to be exceeded, then there are three alternative ways in which to proceed:

- To devise suitable remedial solutions;
- To carry out more investigation, sampling and analysis;
- To conduct a site-specific Detailed Quantitative Risk Assessment (DQRA) to whether or not the soil materials are suitable for their site-specific intended use or to devise a site-specific clean-up level.

Detailed Quantitative Risk Assessment (DQRA)

The decision to carry out a DQRA will be informed by the initial qualitative and generic assessment. The scope of any such assessment will be accurately defined by the outcomes of the former two stages. The robust CSM will be sufficiently refined by this stage that only certain contaminants of concern, certain pathways and certain receptors will require further assessment.

Additional site specific data is normally required for this stage of assessment, as explained above, more processes that are capable of affecting contaminant concentrations are considered (such as dilution and attenuation).

Remediation criteria derived will therefore be specific to each site and will be based on a detailed assessment of the potential impact at the identified receptor or compliance point. A greater level of confidence can be placed on the predicted impact on the compliance point following a DQRA.

Hazardous and Non Hazardous Substances

The Groundwater (England and Wales) Regulations 2009 control the disposal to the hydrogeological environment of potentially polluting substances which are divided into Hazardous Substances and Non-hazardous Contaminants (this roughly approximates to the former List 1 and List 2 substances).

Hazardous Substances are the most damaging and toxic and must be prevented from directly or indirectly entering the groundwater environment. Hazardous Substances include mineral oils and hydrocarbons, pesticides, biocides, herbicides, solvents and some metals. Discharge of Hazardous Substances to Controlled Waters must be prevented.

Non-hazardous Pollutants are any contaminants other than Hazardous Substances. Non-hazardous Pollutants are potentially toxic but are less harmful than Hazardous Substances, but their direct discharge to groundwater is generally not permitted and any indirect discharge to groundwater must be limited and be controlled by technical precautions in order to prevent pollution. Non-hazardous Pollutants include ammonia and nitrites, many metals and fluorides.

APPENDIX K - ASSESSMENT CRITERIA APPLIED FOR GROUND GAS

Ground Gas Monitoring Methodology

Monitoring for the following is generally performed as part of ground gas assessment:

- Methane (CH_4): an odourless, flammable gas. Mixtures of methane with air containing between 5 and 15% v/v methane are explosive.
- Carbon dioxide (CO_2): an asphyxiant at elevated concentrations. Denser than air, it can accumulate in excavations, and within low points inside buildings.
- Oxygen (O_2): important in the assessment of the potential formation of explosive mixtures with methane. Monitoring normally measures both methane and oxygen concentrations in ground gas to derive an indication of the risk of explosive mixture formation, expressed as a percentage of the Lower Explosive Limit (LEL). Low concentrations of oxygen in ground gas can also exacerbate the risk of CO_2 asphyxiation.
- Hydrogen sulphide (H_2S): odorous and toxic, capable of forming flammable mixtures with air.

In addition, depending on the Conceptual Site Model, monitoring may also include for measurements of Volatile Organic Compounds (VOCs); present as chemical contaminants of soil and sometimes also biologically produced in low concentrations.

Assessment of methane (CH_4) and carbon dioxide (CO_2)

Methane and carbon dioxide can arise from natural geological sources, mine workings, rotting organic matter (peat, landfilled materials, etc.) and/or contaminant biodegradation. Assessment of ground gas composition and flows is therefore an essential part of site assessment. The need to adequately address potential risks from ground gas on development sites is therefore required under the planning regime.

In order to appropriately assess the site risks, the Construction Industry Research and Information Association (CIRIA) and others have issued several guidance documents on landfill and ground gas that are intended to provide advice on how to investigate and deal with gas contaminated ground with respect to development. These are:

- Report 149: 'Protecting Development from Methane' (CIRIA, 1995a)
- Report 150: 'Methane Investigation Strategies' (CIRIA, 1995b)
- Report 151: 'Interpreting Measurement of Gas in the Ground' (CIRIA, 1995c)
- Report 152: 'Risk Assessment for Methane and Other Gases from the Ground' (CIRIA, 1995d)

More recent guidance has been published to update the documents detailed above to collaborate and promote industry 'good practice'. These are:

- CIRIA Report 665: 'Assessing risks posed by hazardous ground gases to buildings (CIRIA, 2008)
- NHBC: 'Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present' (NHBC, 2007)
- BS8485:201+A1:2019: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings (BSI Group, 2019)
- BS8576:2013: Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs) (BSI Group, 2013)
- SoBRA Report Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater (Feb 2017)
- CL:AIRE Technical Bulletin TB17 Ground Gas Monitoring and 'Worst Case' Conditions (CL:AIRE Aug 2018)

The earlier CIRIA 149 approach is now considered to be too conservative. A more realistic measure of the risk posed by methane and CO2 in ground gas can be established by determining an appropriate Gas Screening Value (GSV), using the methods described in the NHBC and CIRIA 659 documents. These values are based upon earlier work undertaken by Wilson and Card (1999).

GSVs are calculated by multiplying the borehole flow rate (l/hr) by the percentage (% v/v) concentration in the gas stream of the specific component, i.e.:

GSV = (Concentration / 100) x Flow rate.

A risk-based methodology for deriving GSVs is defined for two situations (designated A and B), which are adequate for the great majority of site cases (as per CIRIA 665 Section 8.3):

- **Situation A**: Any development other than Situation B, e.g. factories, shops, commercial, warehouses, schools, cinemas, sports centres, stadiums, high rise housing, housing with basements, etc
- **Situation B**: Low rise building with minimum ventilated under floor void (min 150mm)

Under Situation A, classification of the scope of protection required is determined from the site GSV, summarised in Table 1. For Situation B, GSVs derived are used in a 'Traffic Light' classification (summarised in Table 2) which determines the required level and scope of protection measures. Tables 1 and 2 are summaries only: the details provided in the body text, footnotes and appendices of the above-referenced documents should be read in conjunction with the results to determine the appropriate level of protection.

For conservatism, Tier Environmental **initially** uses the maximum concentration and gas flow rate of methane detected in any borehole during all of the monitoring visits in deriving recommendations on appropriate protection measures. This represents the worst-case risk of forming an explosive mixtures. For carbon dioxide, steady state concentrations and flow data are applied, as these determine the development of an asphyxiating mixture. All values are selected whether or not they occurred in the same borehole or during the same monitoring event.

Exceedances of the maximum concentrations used in a Tier 1 Gas Risk Assessment can be tolerated, when the conceptual site model indicates that it is safe to do so. However, appropriately derived GSV values must never be exceeded - where site-specific circumstances permit the derivation of alternative GSVs according to the defined conceptual model, then the appropriate GSV values should be applied.

Table 1. GSV Categories Defined for Situation A (Summarised from CIRIA Report 665).

Risk classification	GSV (CH4 or CO2; l/hr)	Additional factors	Characteristic Situation
Very low	<0.07	Typically methane <=1% and/or CO_2 <=5%, otherwise consider increase to Low Risk.	1
Low	<0.7	Typically borehole ground gas flow rate <=70 l/hr; otherwise consider increase to Moderate Risk.	2
Moderate	<3.5	---	3
Moderate to high	<15	QRA required to evaluate scope of remediation measures.	4
High	<70	---	5
Very high	>70	---	6

Table 2. GSV Categories Defined for Situation B (Summarised from NHBC, 2007).

Methane		CO_2		"Traffic light" classification
Typical max. conc. (% v/v)	GSV (l/hr)	Typical max. conc. (% v/v)	GSV (l/hr)	
				Green
1	0.13	5	0.78	
				Amber 1
5	0.63	10	1.60	
				Amber 2
20	1.60	30	3.10	
				Red

Assessment of hydrogen sulphide (H2S)

H2S is toxic and highly odorous ("rotten eggs") gas. It is often a minor component within mine gases, in ground gas within or overlying strata rich in pyrites or other sulphide-rich ores, and in most natural gas fields.

H2S can be generated biologically in significant concentrations by the decomposition by sulphate-reducing bacteria of natural or anthropogenic organic matter under oxygen-free conditions. Its potential generation will be greater in environments containing elevated sulphate concentrations (including sea water). H2S is therefore common within the gas arising from estuarine and marine sediments, pond sediment, stagnant water bodies, bogs and marshlands and landfilled waste, for example.

It must be noted that H2S normally occurs together with other potentially hazardous ground gases. The measures adopted for protection against these will prove equally protective against H2S.

There are no standards by which H2S concentrations in ground gas can be assessed directly. Therefore, the significance of measured H2S concentrations in ground gas must be evaluated on a case-by-case basis, taking into account the measured concentrations of other components and the specific conceptual site and exposure models. To assist in this process, the following standards and guidance may be applied.

General protection of land users

There are no UK air quality standards for general exposure to H2S. The World Health Organisation has derived ambient air quality standards (WHO, 2000) for this gas, which may be used to inform risk assessment and decision-making:

The 24 hour average exposure guideline value for ambient air: 0.15mg/m3 (0.1 ppmv, approx.; this was derived by the application of a 100x safety factor to the LOAEL for long-term exposure).

This is significantly above the odour threshold, which is typically around 0.01 mg/m3. To avoid substantial nuisance odour complaints, WHO (2000) recommends that the 30 minute average H2S concentration in ambient air should not exceed: 0.007 mg/m3 (0.005 ppmv, approx.).

Occupational exposures

For occupational exposure, the HSE (2005) limits for H2S are applicable:

- 8 hour time weighted average occupational exposure limit: 5 ppmv (7 mg/m3).
- Short-term exposure limit (15 minute reference period): 10 ppmv (14 mg/m3).

VOC Data Collection, Sampling and Assessment

BS8576 Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs).

Volatile organic compounds (VOCs) include, for example, halogenated hydrocarbons such as trichloroethene, non-halogenated hydrocarbons such as benzene, and organosulfur compounds such as thiols (mercapatans). They can occur as a component of ground gas originating from historically contaminated ground, spills and leaks from industry, commercial or residential properties (e.g. from pipelines, storage facilities, and at the point of use or dispensing), land-filled wastes and from naturally occurring sources.

The migration of VOCs in ground gas can be via three primary mechanisms:

- diffusive flow (movement of constituent along a concentration gradient);
- advective flow (movement of constituent due to motion of a transporting fluid);
- dispersion (transport resulting from local variations in fluid flow, e.g. due to friction effects in the matrix).

The choice of sampling and monitoring techniques should be based upon the conceptual model and be designed to achieve the objectives of the investigation, bearing in mind the requirements of any subsequent analytical procedures and the need to provide relevant data of sufficient quantity and quality. Consideration should also be given to the nature of ground under investigation, as well as the nature and distribution of contamination, the geology and the hydrogeology. Every effort should be made to avoid cross-contamination and at no point should underlying aquifers be put at risk.

Where the response zone extends below the water table, gas present in the groundwater will tend to produce an equilibrium concentration in the well headspace. This applies to both permanent gases and VOCs but can be particularly misleading in the latter case. Testing for dissolved gases in groundwater is useful to help interpret monitoring results in such a situation. Similarly, any VOCs in a floating non-aqueous hydrocarbon layer will produce an equilibrium concentration in the well headspace.

The monitoring period and frequency of monitoring for VOCs in ground gases should be developed on a site-specific basis from the conceptual site model and investigation data quality objectives.

Ground gas samples can be collected from the unsaturated zone adjacent to, or above, the known or suspected source of VOCs in ground gas through installation of a ground gas monitoring point in the unsaturated zone (see 10.2), and from a near-surface location beneath hardstanding or a floor or foundation slab through installation of a near- or sub-slab monitoring point (see 10.3). For monitoring of VOCs in ground gas the monitoring well should be installed into unsaturated ground to allow sampling for VOCs to take place. The borehole should not be progressed below the groundwater table or the surface of any floating non-aqueous layer. The borehole should be progressed to the target sampling depth within the unsaturated zone. Full details can be found in BS8576 Section 10.2 onwards.

Assessment of VOC concentrations have been made for limited number of VOCs by SoBRA with the Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater in Feb 2017.

The assessment of VOC concentrations is not covered by above-referenced reports. These data can be used to inform the human health risk assessment for site occupants but should not be relied upon to assess human health risk due to uncertainties in the ground gas flow regime, variability in the (generally low) contaminant concentrations measured and inaccuracies in the concentrations measured by PID instruments.

Data on the VOC concentration in ground gas can also help inform potential occupational exposure risks to construction and similar workers. For this purpose, the measured values can be compared to the relevant occupational exposure limit (OEL) for the contaminant(s) of concern, as given in HSE (2005). In cases of doubt as to the identity of the organic contaminants within the ground gas or when these are present as a complex mixture, then the 8 hour time-weighted average (TWA) exposure limit for benzene (1 ppmv) will be applied for screening purposes. This is a reasonably conservative approach since the OEL for benzene is lower than that for the great majority of organic contaminants commonly encountered in soil and groundwater at contaminated sites.

APPENDIX L - CHEMICAL AND GEOTECHNICAL TEST SAMPLING

Samples were selected by a representative of Tier Environmental during the site investigation works in accordance with the sampling approach described elsewhere in this report.

Samples for geotechnical and related testing

Bulk samples were placed within robust heavy duty plastic bags and sealed, together with small-disturbed samples, within airtight 1 litre plastic containers.

100mm diameter 'undisturbed' samples ("U100 samples") were obtained where possible from cable percussive and large diameter window sample boreholes within cohesive materials.

Samples for chemical analysis

All samples for chemical analysis were placed into clean new containers as summarised in Table 1. Unless explicitly stated elsewhere in this report, no preservatives were used to eliminate the risk that preservatives cause contaminant dissolution or analytical interference. Containers for VOC analysis were fully filled to exclude headspace.

Soil samples were dispensed as soon as possible after collection using reusable stainless steel spatulas, trowels or similar implements.

Ground water samples were collected from boreholes using single-use Teflon bailers or dedicated Waterra tubing with foot valves, except as otherwise noted within this report. Caution was taken to avoid excessive agitation during collection.

New disposable gloves were used by the engineer for the collection of each sample.

Reusable equipment was washed down with distilled or deionised water between samples, except where tarry or similarly sticky materials were present. In such cases specific cleaning procedures were adopted as specifically described elsewhere in this report.

All sub-samples taken for chemical analysis were placed into refrigerators or cool boxes containing frozen ice packs immediately after aliquoting. All samples were transferred in cool boxes containing frozen ice packs to the relevant UKAS/MCERTS accredited laboratory as soon as possible. Recommended maximum holding times before analysis are summarised in Table 1.

Table 1. Sample containers and holding times.

Analysis	**Container/special requirements**	**Max. holding time at 4°C before analysis**
Soil and sediment samples		
VOCs	30-60 g brown or green glass jar with VOC-resistant cap and inert cap liner. Must be fully filled.	14 days
TPHCWG	30-60 g brown or green glass jar with VOC-resistant cap and inert cap liner **PLUS** 250-500 g brown or green glass jar with unwaxed cap liner.[1] The former must be fully filled.	14 days
All other organics	250-500 g brown or green glass jar with unwaxed cap liner.	7 days
Inorganics	Air-tight 0.5-2.0 kg plastic container (250-500 g brown or green glass jar may also be used).	14 days[2]
Water samples		
VOCs	40-50ml glass vial with VOC resistant screw cap and inert liner. Must be fully filled.	14 days
TPHCWG	40-50ml glass vial with VOC resistant screw cap and inert liner **PLUS** 500-1000ml brown or green glass bottle with screw cap and unwaxed liner.[1] The former must be fully filled, the latter should be filled if possible.	14 days
All other organics	500-1000ml brown or green glass bottle with screw cap. Fill if possible.	7 days
Inorganics	500-1000ml translucent or opaque screw cap plastic *or* brown or green glass bottles. Fill if possible.	14 days[3]

1 The smaller vessel is used for analysis of the volatile components within the TPH mixture and the larger one is for the non-volatile components.

2 14 days is set as a reasonable limit for all routine analyses of soil for those inorganic components vulnerable to chemical and/or biological breakdown. Samples for sulphate analysis are vulnerable to biological sulphate-reduction but can be held for up to 28 days. For total metals, a holding period of up to 6 months is acceptable.

3 14 days applies for all routine analyses of most inorganic components that may be vulnerable to chemical and/or biological reactions. In the specific cases of sulphide, nitrite, nitrate and phosphate analyses, storage time must not exceed 48 hours. For total metals, a holding time of up to 6 months is acceptable.

Tier Environmental standard analytical suites

The analyses included with Tier Environmental's standard analytical suites for soil, soil leachate and water samples are presented in Table 2. Other individual analyses were specified as described within this report.

Table 2. Tier Environmental Standard Analytical Suites.

Parameter	**Sample type**					
	Soil		**Leachate[1]**		**Water**	
		LoD[2] (mg/kg or as stated)		**LoD (µg/l or as stated)**		**LoD (µg/l or as stated)**
Metals and metalloids						
Arsenic	✓	1	✓	10	✓	10
Cadmium	✓	1	✓	5	✓	5
Chromium	✓	1	✓	5	✓	5
Mercury	✓	1	✓	1	✓	1
Lead	✓	1	✓	4	✓	4
Selenium	✓	2	✓	10	✓	10
Copper	✓	1	✓	1	✓	1
Nickel	✓	1	✓	50	✓	50
Zinc	✓	1	✓	8	✓	8
Other inorganics						
Ammonia (as NH_4-N)					✓	15
Total sulphate	✓	100			✓	50 mg/l
Water-soluble sulphate	✓	0.1 g/l				
Hardness (as $CaCO_3$)					✓	1 mg/l
Organics						
Monohydric phenol	✓	1	✓	0.5	✓	0.5
Speciated PAHs (USEPA 16)	✓	0.1	✓	0.01	✓	0.01
Total Organic Carbon	✓	0.1 wt%				
Others						
Electrical conductivity					✓	NA
pH	✓	NA	✓	NA	✓	NA

NA - Not applicable

1 Leachate preparation according to NRA (1994), 10:1 liquid to solid ratio.

2 The table presents the desired limit of detection for the analysis. Higher LoDs may be reported on analytical data sheets due to interference between analytes within specific samples or if the laboratory needed to dilute samples to achieve results within the calibrated range for that instrument.

Analytical QA procedures

Introduction

Quality Assurance (QA) is a system of review and audit that assesses the effectiveness of that product and assures the producer and user that defined standards of quality have been met. If we consider site investigation and chemical analysis, QA is the management system that ensures these measures are in place and working as intended.

QA within the laboratory form part of relevant certification programmes (such as UKAS and MCERTS) and, indeed, will be undertaken in some form by any reputable analyst, whether for a certified technique or not. Laboratory QA/QC is beyond the control of Tier Environmental and will not be considered further in this document, although the relevant laboratory documentation can be obtained upon request. QA must also form part of the design and execution of a site investigation.

Two parameters often used to assess measurement quality objectives are bias and precision. Bias is a systematic deviation in the data. For example, a positive bias (concentrations higher than in reality) would be introduced if sampling bottles were a source of the analyte and this fact was unknown. Precision is the variation in the measurements around a central 'expected' value. This could be due both to real variability in the environmental medium being measured and random errors in the analytical process. Both precision and bias can be assessed by the use of appropriate blanks and replicates within the site investigation programme.

The objectives of the QA activities undertaken in this present site investigation were to recognise and quantify systematic bias within the analytical dataset and to obtain an indication of precision. In environmental samples, much of the observed variability is likely to result from heterogeneity in the sampled medium, particularly for soil and sediment samples.

Such QA practice within the sampling programme is required by current guidance (e.g., Environment Agency report P5-065/TR (2000); Environment Agency LFTGN02 (2002); BS 10175:2001).

Alternative QA procedures to the generic approach presented in this appendix may be specified for a project, provided case-specific justification is given.

QA checking procedure (data validation)

The responsible Engineer and Project Reviewer are required to undertake data validation and provide comment on data quality within the main body of the report(s) issued, when noteworthy matters arise. This QA checking should involve:

Confirming that data reported by the laboratory have achieved the standards specified by the certification scheme (MCERTS or UKAS). This will be indicated on the analytical certificates issued by the laboratory.

Checking that the limit of detection (LoD) and limit of quantification (LoQ) achieved by the laboratory for an individual analyte is appropriate for the purposes of the report. LoD and LoQ will vary dependent upon analyte concentrations, sample matrix properties and interference from co-contaminants.

A check that the reported range of concentrations are reasonable for the analyte. For example, the dissolved concentration of an analyte in a water sample should not exceed saturation. If it does, then this merits further consideration (e.g., was colloidal organic matter or other solid-phase material present or could there have been unobserved free-phase organic liquid?) and explicit comment. At its simplest, there may be a unit error.

Where analysis involves reporting of Tentatively Identified Compounds (TICs; normally by mass spectrometry), the reviewers should check that these might reasonably be expected at the site under consideration. The uncertainties in identification by MS mean that it is not uncommon that TICs are incorrectly assigned. In cases of doubt, the analytical laboratory can re-check the raw data and confirm.

A review of the analytical precision by comparing data obtained for duplicate samples. There is no absolute threshold - variability is entirely dependent upon the sample matrix and manner in which the contaminant has entered the sample. Variability that cannot reasonably be assigned to such factors (for example a very high apparent variability in data for sediment-free water samples) should be reviewed with the laboratory. Variability that is attributable to the sample matrix can nevertheless provide important pointers to improve understanding of contaminant transport pathways and the risks posed by pollutant linkages (e.g., soil heterogeneity, the association of contamination with particular soil fractions, the presence of residual NAPL within soil pores or the role of suspended sediments in contaminant transport).

Confirmation that no errors have been introduced by data transcription, unit conversion or corrections between preliminary and certificates issued by the laboratory. The reviewer should audit a proportion (typically 5-10%) of all data from the original (final) certificates of analysis through to the equivalent values in the report for those specific samples.

In is important to consult the analytical laboratory if apparent QA issues arise. Many apparent concerns can be adequately resolved on the basis of revisiting the raw analytical data or by obtaining a better understanding of the inherent limitations of the analysis for a particular matrix or sample type.

APPENDIX M - COAL TAR CONTAINING ASPHALT CONSIDERATIONS

Tier Environmental Approach to Coal Tar in Asphalt

This appendix outlines a summary of available guidance and describes the Tier Environmental interpretation of available information to inform, in a robust manner, the approach adopted to consider on, or both of the following objectives:

- If asphalt is present on site, what the waste classification and waste disposal route should be if there is an intention to grub up and dispose of either some, or all, of the asphalt;
- If asphalt is present and there is an intention (subject to suitability for re-use assessment) for re-use, then to determine how that may be achieved.

In order to info the decision making with respect to the above, the following guidance documents and articles have been referenced:

- Waste Classification - Guidance on the classification and assessment of waste (1st Edition v1.2.GB) Technical Guidance WM3. Environment Agency, Scottish Environmental Protection Agency and Natural Resources Wales;
- Managing Reclaimed Asphalt Highways And Pavements - An ADEPT & Construction Demolition Waste Forum Guidance Note (Version 2019 Revision 1, August 2019);
- Environment Agency Regulatory Position Statement 075: 'The movement and use of treated asphalt waste containing coal tar';
- Environment Agency Regulatory Position Statement 157: 'Storing and treating asphalt waste: RPS 157' (Updated 4th February 2020);
- Environment Agency WRAP Quality Protocol - Aggregates from inert waste. End of waste criteria for the production of aggregates from inert waste;
- CIRIA Sustainable management of surplus soil and aggregates from construction, CIRIA, C809, dated 2023;
- Contaminated Land: Applications in Real Environments (CL:AIRE) (2011) Definition of Waste Code of Practice (version 2);
- SEPA Guidance on the Production of fully Recovered Asphalt Road Planings (Scotland);
- AGS magazine – article entitled 'Coal Tar: Analysis and Detection' (March 2023 edition)

COAL TAR CONTAINING ASPHALT

WM3 includes the following text with regards to ascertaining the correct EWC code for waste asphalt:

> ***Waste containing coal tar***
>
> *This example provides guidance on the classification of road asphalt waste containing coal tar (AWCCT) and other construction and demolition wastes containing coal tar and related materials. This does not apply to wastes where coal tar is known not to be present.*
>
> *Coal tar and many coal tar distillates are potentially carcinogenic hazardous substances. If the concentration of such materials is at or above 0.1% the waste would possess the hazardous property HP 7 carcinogenic. Coal tar is complex mix of hydrocarbon compounds which have to be added to together to determine the concentration of coal tar. Therefore the 0.1% concentration must be applied to all fractions of the coal tar. Assessments based on PAH's alone are not consistent with the legislation and cannot be used to classify a waste as non-hazardous. However, if the concentration of coal tar is known, the MCL under the GB CLP uses benzo[a]pyrene (BaP) as a marker compound for carcinogenicity for certain coal tar entries. Where the concentration of BaP is less than 0.005% of the concentration of the coal tar (rather than in the waste as a whole), the coal tar is not carcinogenic and does not need to be considered for HP7.*
>
> *'Black top' (road surface) waste*
>
> *The following applies only to Asphalt material classified in the List of Wastes as*
>
> - *17 03 01* bituminous mixtures containing coal tar*
> - *17 03 02 bituminous mixtures other than those mentioned in 17 03 01*
>
> *Where the concentration of benzo[a]pyrene is at or above 50 ppm (mg/kg) in the black top alone (excluding other material) then the amount of coal tar should be considered to be sufficient (0.1% or more) for the material to be hazardous and thus coded 17 03 01*. Any sampling of black top would need to ensure that layers with different concentrations of benzo[a]pyrene are identified and sampled.*

Tier Environmental have observed third party assessments that have determined 'black top' (road surface) waste as non-hazardous when benzo(a)pyrene is at or below 50mg/kg; however, it is considered that this represents a misunderstanding of WM3 guidance for the following reasons:

1) The first paragraph in the 'Waste containing coal tar' section of WM3 is clear to state that *'This example provides guidance on the classification of road asphalt waste containing coal tar (AWCCT) and other construction and demolition wastes containing coal tar and related materials.';*
2) It also states, explicitly that *"Assessments based on PAH's alone are not consistent with the legislation and cannot be used to classify a waste as non-hazardous"*. Tier Environmental consider this statement is tacit to include road asphalt waste containing coal tar (AWCCT) as it is mentioned in the previous paragraph;
3) The 'Black top' (road surface) waste sub-section states *"Where the concentration of benzo[a]pyrene is at or above 50 ppm (mg/kg) in the black top alone (excluding other material) then the amount of coal tar should be considered to be sufficient (0.1% or more) for the material*

to be hazardous and thus coded 17 03 01"*. However, this does not mean that benzo(a)pyrene concentrations less than 50mg/kg can be classed as non-hazardous when you take into consideration the text in Item 2), above. This either suggests a contradiction in the guidance, or that benzo(a)pyrene alone can only be used to prove the whether the AWCCT is hazardous but that the opposite does not classify the material as non-hazardous such that to prove non-hazardous you would still require the concentration of the coal tar to be determined.

The AGS article (March 2023) states that for determining whether asphalt waste is hazardous waste that "we *also* have to consider [B(a)P being greater than or equal to 50mg/kg]" suggesting that is consistent with the Tier Environmental interpretation. However, a bit further down the article states that the ADEPT Guidance reiterates and references WM3 and *"the use of the 50mg/kg level for measuring B(a)P should the total coal tar concentration values not be available for measurement"*. Tier Environmental's interpretation of WM3 is that it does not make reference to the 50mg/kg B(a)P level being used as a threshold *in lieu* of a coal tar concentration value being available.

So if, in order to determine whether asphalt is non-hazardous waste, there is a requirement for the concentration of coal tar to be analysed then a decision needs to be made as to what type of coal tar test is adequate. The AGS article (March 2023) highlights that *"One of the challenges facing laboratories is the lack of standardization in the specification from clients and, also, the analysis itself".* The article explains that a review by the AGS Laboratory Working Group revealed a range of techniques and *"a potentially confusing landscape for the industry to navigate"*.

The ADEPT Guidance states there is data corroborating this assertion that 50mg/kg correlates to around 1000mg/kg road tar, this data is presented in Appendix D4.0. of the ADEPT Guidance document; however, Tier Environmental notes that the ADEPT Guidance states *"This guidance is not intended as a complete guide to managing waste materials and should be read in conjunction with Regulations and guidance issued by the relevant Regulator, these will take precedence over this guidance in all cases"*. As such, with respect to waste classification WM3 takes precedence over the ADEPT Guidance and WM3 does not provide details of any corroboration between B(a)P and road tar.

RE-USE OF ASPHALT

The AGS article (March 2023) summarises the ADEPT Guidance as follows:

> The ADEPT guidance provides more specific focus on the managing of reclaimed asphalt and provides information in to the classification of waste. It reiterates and references WM3 and the 0.1% threshold for coal tar and also the use of the 50mg/kg level for measuring B(a)P should the total coal tar concentration values not be available for measurement [see Tier Environmental comment above regarding this statement].
>
> What the ADEPT guidance then gives, is a clear and defined protocol for sampling, sample preparation, sample volumes and data review with also indication of analytical requirements and basic principles. The document gives details and refences to specific British Standards for the sampling and preparation of road plannings and road cores (BS 932 and BS 12697), and then recommends the following testing:
>
> - PAH analysis in the laboratory by gas chromatography mass spectrometry (GCMS) for the USEPA16 suite of PAHs, though only B(a)P may be necessary. It is worth noting here that labs will test for the full suite in a single process so requesting B(a)P only will usually give no cost or speed benefit. Should further characterisation for landfill disposal be required then the USEPA17 suite inclusive of coronene should be used,
> - Screening methods such as PAK marker sprays or Acrylic White sprays can be used but validated by the use of frequent 'full' analysis,
> - Specifies the use of Monohydric Phenol (Phenol Index) testing, with a potential requirement to speciate the individual compounds (Phenol, Cresols and Xylenols) should the levels be sufficiently high.
>
> In terms of data review the 3 potential outcomes are:
>
> 1) Classed as Inert for the purposes of the Quality Protocol for Aggregates from Inert Waste if:
>   a. The guidance of sample numbers has been observed,
>   b. All the B(Aa)P results are below 25mg/ kg,
>   c. There are ≥3 results.
> 2) Classed as Hazardous and treated accordingly is:
>   a. All the B(a)P results are above 50mg/kg Note: If there are limited results and close to the threshold then further investigation is required.
> 3) Full statistical analysis required to make assessment if:
>   a. Some or all results are above 25mg/kg and below 50mg/kg.

Tier Environmental once again notes that the ADEPT Guidance states *'This guidance is not intended as a complete guide to managing waste materials and should be read in conjunction with Regulations and guidance issued by the relevant Regulator, these will take precedence over this guidance in all cases'*. As such, with respect to *waste classification* WM3 takes precedence over the ADEPT Guidance.

ENVIRONMENT AGENCY REGULATORY POSITION STATEMENTS 075 AND 157

The ADEPT Guidance describes that these documents allow the treatment, movement and use of asphalt waste containing coal tar in construction operations for hard paving structures in England only. They do not enable the producer to demonstrate that end of waste criteria has been met, but they do state that if followed correctly, the EA will not pursue an application for an environmental permit.

CIRIA C809 states the following:

RPS 75 (EA, 2014d) allows the use of treated asphalt waste containing coal tar (AWCCT) (i.e. classified as hazardous) in specific construction operations for hard paving structures such as roads, pavements, footways, car parks and airfields.

While AWCCT is commonly treated by crushing, grinding, and screening, the treatment of AWCCT is not covered by this RPS. The AWCCT needs to meet the requirements of the Specification for Highways Works and can only be used in bound sub-surface layers, e.g. sub- base, base and binder layers.

SEPA GUIDANCE ON THE PRODUCTION OF FULLY RECOVERED ASPHALT ROAD PLANINGS (SCOTLAND)

The ADEPT Guidance describes that this document provides approved methodology that allows producers to demonstrate when aggregate produced from asphalt has been fully recovered and has ceased to be a waste. This guidance is only applicable in Scotland. However, it is not applicable to tar bound aggregates, asphalt contaminated with other substances or asphalt removed/processed by any other method than a road planer.

WRAP QUALITY PROTOCOL - AGGREGATES FROM INERT WASTE. END OF WASTE CRITERIA FOR THE PRODUCTION OF AGGREGATES FROM INERT WASTE

The ADEPT Guidance summarises that this document is applicable to England, Northern Ireland and Wales. It identifies that certain specified inert wastes (including uncontaminated asphalt) may achieve end of waste status through treatment and use in compliance with the Quality Protocol for recycled aggregates from inert waste.

RE-USE UNDER DOWCOP

Tier Environmental consider that *in situ* asphalt may be reasonably considered for re-use under DoWCoP, (subject to following DoWCoP fully including conducting site-specific risk assessments to demonstrate suitability for use) as it would constitute "*Source segregated aggregate material arising from demolition activities….*".

If the asphalt materials are coal tar containing then it would be necessary to consider the potential risks to human health and controlled waters carefully and agreement with the Local Authority (via Contaminated Land Officer or equivalent), Environment Agency / Natural Resources Wales local waste team / groundwater team would be necessary.

Due consideration may also need to be given to Series 600 if the materials is to be combined with other materials to form an engineering material.

APPENDIX N - COMPLYING WITH CONTROL OF ASBESTOS REGULATIONS 2012

Complying with Control of Asbestos Regulations (CAR): Risk Assessments, Licensing and Training

This appendix outlines CAR risk assessments and where they should be applied in relation to assessing and remediating brownfield sites. The information below details the different classifications of work with asbestos under CAR, summarises the legal requirements for asbestos awareness training for all involved in the investigation and management of asbestos containing soil (ACS), and details the potential requirements for suitable proficiency training relating specifically to ACS.

CAR RISK ASSESSMENTS

A CAR Risk Assessment is required for any work which may expose employees to asbestos. It is recommended that a precautionary approach is adopted if there is any doubt about risks associated with asbestos.

There are three main activities for potential asbestos exposure during work on brownfield sites:

- Site reconnaissance visits;
- Site investigation works; and
- Site remediation.

CAR risk assessments are needed at each stage but may be incorporated during the site investigation stage into the overarching health and safety risk assessments.

The CAR risk assessment must:

- Identify the type of asbestos to which employees are liable to be exposed, where possible, or assume it is present in different forms;
- Determine the type and extent of exposures to asbestos that may occur during the work.
- Identify the steps to be taken to prevent exposure or reduce it to the lowest level reasonably practicable; and,
- Consider the effects of control measures that have been or will be taken.

The CAR risk assessment should include any information used to inform the risk assessment such as asbestos reports or desk study information. In the event that this information is not available, the assessor should be assumed that all forms of asbestos may be present on site.

For all investigation and remediation of ACSs, a detailed written work plan should he produced and followed as detailed on the HSE website and in the CAR.

The CAR risk assessments for specific investigations or remediation projects, will determine whether or not work is 'licensable work' (LW)**,** notifiable non-licensable work' (NNLW) or 'non-licensed work' (NLW). In addition, training requirements are also defined by the CAR risk assessment.

Some examples of control measures that apply during site reconnaissance, site investigation works, and site remediation are given below and should be applied depending on the asbestos risks identified for the site at each stage of investigation:

- Avoiding stirring up dust;
- Cleaning footwear after site works;
- Removing and bagging any overalls for disposal/laundering;
- Respirators and hygiene facilities for high risk sites;
- Segregated welfare units;
- Wetting ground
- Minimising soil disturbances;
- Implementation or retention of capping/break layers;
- Implementation of awareness training;
- Air monitoring;
- Managing stockpiles;
- Area segregation;
- Wheel washing
- Road washing/cleaning

It is important to note that during site reconnaissance visits, site investigation works and site remediation that asbestos should not be considered in isolation and control measures are likely to form part of a wider health and safety precautions.

Respiratory protective equipment (RPE)

RPE is the last line of defence and its requirement would be defined by the CAR risk assessment. HSE (2013b) advises that RPE should have an assigned protection factor of 20 or more for all work with asbestos. In certain instances, full face-piece, positive pressure respirators with a protection factor of 40 are necessary (to EN 12942:1998, TM3).

Suitable types of RPE for most ***short*** duration non-licensed asbestos work:

- Disposable respirator to standards EN149 (type FFP3) or EN1827 (type FMP3)
- Half mask respirator (to standard EN140) with P3 filter
- Semi-disposable respirator (to EN405) with P3 filter

These filters are not suitable for people with beards/stubble or for long or continuous use.

LICENSING

CAR defined certain types of activities involving asbestos as 'licensable work' (LW) or as 'notifiable non-licensable work' (NNLW). All other work would be 'non-licensable work' (NLW).

LW is defined as:

- work where exposure is not 'sporadic and low intensity'.
- work where the risk assessment cannot demonstrate that the control limits (four hour and 10 minute limits) will not be exceeded.
- work on asbestos coating
- work on AIB or insulation where risk assessment is either of first two points above or not of short duration (where short duration is defined for any work liable to disturb asbestos as taking less than two hours per week (including ancillary work) and no one person carries out that work for more than one hour').

NNLW includes work with:

- AIB or asbestos insulation of short duration that is not licensable.
- fire-damaged asbestos cement or asbestos cement damaged so as to create significant dust and debris.
- asbestos ropes, yarns, woven cloths in poor condition or handling cutting or breaking up the materials.
- asbestos papers, felts and cardboard in poor condition, unencapsulated or not bound into another material.

Work with weathered asbestos cement, air monitoring and collecting samples of ACM in buildings would not normally be notifiable.

It is impossible to specify definitively what activities will and will not be licensable. This decision should be made as part of the CAR risk assessment. CAR is not primarily aimed at work with ACSs and there is little published information on airborne asbestos concentrations during work with ACSs. Nevertheless, CAR will require some remediation projects, and occasionally site investigations, to be LW. Investigations on other sites may involve NNLW. The decision as to whether work is LW or NNLW should be made during the CAR risk assessment by those in charge of the brownfield site investigations and remediation projects.

TRAINING REQUIREMENTS

Asbestos health and safety courses are offered by a number of providers in the UK. Training courses that include the problem of identifying ACMs in soil should be undertaken at regular intervals by those involved in the investigation, assessment and management of sites where ACs are known or suspected. It is the role of the employer to identify the level of training required for an employee based on their role, experience and duties. Reference to Regulation 10 of CAR should be referred to for more information on training requirements.

Recognising asbestos within soils is challenging due to the heterogeneity of such soils and the discolouration of asbestos by smeared soil. Specific training for ground workers should include understanding fibre release potential, potential control measures in the field, how to take representative ACSs safely, sample labelling and what analytical tests are available and when the y should be implemented.

Health and safety training required under CAR includes asbestos awareness, non-licensable work (including notifiable non-licensable work) and licensable work with asbestos.

In addition to health and safety training, some staff involved in the technical identification on site of ACMs, sampling and analysis may require technical proficiency training (competency training).

Training vs. Competence

HSE (2005) identifies that 'training alone does not make people competent. Training must be consolidated by practical experience so that the person becomes confident, skilful and knowledgeable in practice on the job'. It is critical that ACS surveyors demonstrate competency with details of relevant field experience alongside training and examples of previous works/references.