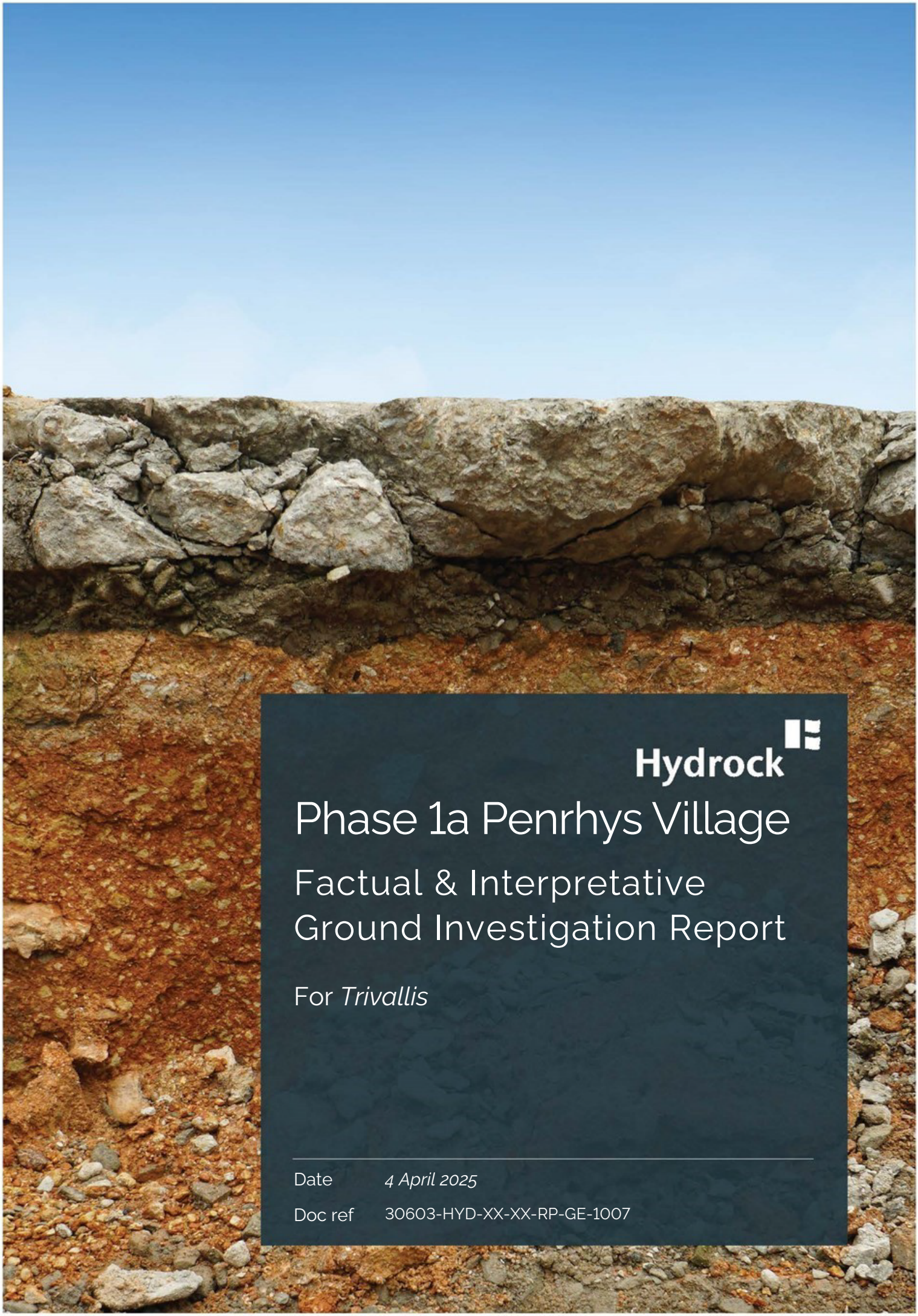

Hydrock

Phase 1a Penrhys Village

Factual & Interpretative Ground Investigation Report

For *Trivallis*

Date	*4 April 2025*
Doc ref	30603-HYD-XX-XX-RP-GE-1007

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Executive Summary

Site Information and setting	
Objectives	The objectives of this report are: » To present a CSM specific to the Phase 1a area » to resolve geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study and Phase 2 Preliminary Ground Investigation Report by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023); » to identify geo-environmental mitigation requirements to enable development to progress; » to provide preliminary geotechnical recommendations for design; and, » to provide depth to bedrock contours to assist with the detailed design.
Client	Trivallis
Site name and location	Phase 1a, Penrhys Village, Ferndale, CF43 3RE Centred around the National Grid Reference ST001950 on the hill between the Rhondda Fach and Rhondda Fawr valleys.
Proposed development	The proposed development is to comprise the erection of 89 new low rise houses with private gardens and 3 four to six storey apartment blocks with associated accessways, SuDS features, retaining walls, slopes and public open space.
Site Description	The site is currently comprised of large areas of open scrubland in the west and northeast of the site with low-rise residential housing in the centre and southeast of the site.

Desk study information	
Topography	The site is formed of variably sloping ground with a maximum elevation at the northern boundary c. 347 mAOD and a minimum elevation at the southern boundary c. 321 mAOD. Slope angles for the site are typically in the region of 10 degrees, with discrete areas of steeper sloping parts of the site up to 40 degree slopes
Hydrology	Two unnamed inland rivers are present to the immediate north and 10m southwest of the site. A Spring and inland river network are present c. 250m southwest of the site that drain into the Afon Rhondda. The site is within the catchment boundary for the Afon Rhondda Face some 850m east of the site, with the extreme west of the site within the catchment for the Afon Rhondda some 650m west.
Site history	The site comprised open fields and marshland from the earliest available historic maps, until the early 1970s when residential housing was constructed across Phase 1a and wider Penrhys Village site. Demolition of numerous houses within the Phase 1a area and wider site occurred between 2000 and 2010. Since this there have been no significant changes of note.
Geology	The geology at the site consists of Made Ground over Rhondda Member lithic arenites with thin interbedded mudstone/siltstone and seatearth with thin coals.
Natural geological hazards	Risk above low have not been identified for potential natural geologic hazards on site.
Anthropomorphic geotechnical hazards	Two coal seams are present beneath the site, the No.2 Rhondda and the Two foot Nine seam. Due to depth of the seams beneath the site, c. 180m and 400m respectively, and limited thickness (<3ft) it was concluded that the potential for extensive workings at depth beneath the site was unlikely. A number of roadways associated with the mining of the Two foot Nine seam are mapped beneath the site. However, due to the significant depth to the seam, no significant risk is present.
Hydrogeology	The Rhondda Member sandstone is a Secondary A Aquifer. The site is not within a source protection zone.
UXO risk	A non-specialist UXO assessment indicates a low bomb risk.

Ground model proven by investigation	
Ground and groundwater conditions encountered by investigation	The ground conditions as proven by the investigations undertaken at the site comprise: » Made Ground – between 0.60m and 3.00m below ground level (bgl), comprising variably gravelly clayey sand/sandy clay with demolition rubble, plastic and timber fragments; over » Weathered Rhondda Member Sandstone – between 0.60m and 3.00m to 4.00m bgl, comprising thinly to medium bedded sandstone, recovered as sandy very clayey gravel or very gravelly sand with medium to high cobble content of fine to coarse subangular to subrounded sandstone.; over » Rhondda Member Sandstone – between to the full depth of the investigation, comprising partially weathered heavily fractured thinly to medium bedded greyish brown medium to coarse grained sandstone. Groundwater was not encountered. Perched water levels recorded post-fieldwork ranged from 0.27m bgl to 1.72m bgl (323.93m OD to 323.22m OD).
Summary of geotechnical conclusions	
Groundwork	Obstructions associated with former development, including foundations, floor slabs and services, should be anticipated. Excavation to proposed founding depth generally should be readily achievable with standard excavation plant. Heavy duty excavation plant/breaking equipment may be required to excavate the competent /concrete obstructions. Excavations during investigation were generally unstable and collapse should be expected from the Made Ground where large boulders are present. Water seepages into excavations are likely to be adequately controlled by sump pumping.
Foundations	Foundations are recommended to comprise strip/trench fill or pad like foundations constructed from concrete manhole rings. A safe net bearing pressure of 150 kN/m^2 should be available for strip/trench fill foundations and pad foundations 1.0m x 1.0m in size. Floor slabs are recommended to be suspended because of depth of Made Ground.
Roads and pavements	For road and pavement design, a design CBR of 2.5% is recommended.
Sustainable drainage	Soakaway drainage is considered suitable for this site where soakaways are proposed in natural strata.
Buried concrete	For all soils a Design Sulphate Class of DS-1 and ACEC Class of AC-1s is recommended. This is equivalent to Design Chemical Class DC-1 for a 50-year design life.

Summary of geoenvironmental assessment	
Human health	Slightly elevated concentrations of arsenic, benzo(a)pyrene, benzo(b)fluoranthene and dibenz(a,h)anthracene when compared to the GAC. However, not considered an unacceptable risk (subject to regulatory approval). Asbestos fibres detected within one location with quantification returning <0.001% w/w. Low risk concluded to human health.
Phytotoxicity	No risk to plants from recorded concentrations of potential contaminants, however no suitable growing medium is present on site and therefore as a minimum, topsoil will require importing.
Controlled Waters	Soil leachate samples exceed environmental quality standards for ammoniacal nitrogen, chloride, sulfate, copper, iron, lead, zinc and fluoranthene as an indicator of potential groundwater risk. Identified contamination is considered to pose a low risk to controlled waters based on the regional heavy industrial setting and generally poor water quality of the underlying groundwater body.
Natural background concentrations	No elevated concentrations of heavy metals recorded.
Radon	The site is in an area where1 to 3% of existing homes are affected by Radon, however the risk is such that no protection measures are deemed necessary for new buildings.
Construction materials	No risk to construction materials identified.
Potable water pipes	Brownfield site and the presumption in the guidance is that barrier pipe will be used. However, the investigation and assessment has indicated no significant Contaminants of Concern and as such standard pipework may be suitable for the site following negotiations with the supply company.
Ground gases or vapours	Low risk from ground gases with CS1 conditions apply. No special protection measures required.
Ecology	No protected habitats are present on-site or neighbouring the site.
Updated conceptual site model based on ground investigation	
Plausible contaminant sources	» Made Ground containing elevated concentrations of PAH and asbestos containing materials » Asbestos within existing buildings/ structures » Asbestos containing materials associated with gaskets on pipe work of former district heating network
Plausible contaminant linkages (for receptors for which there is or will be a pathway)	Humans (residential with home grown produce) Controlled waters – River Rhondda and Afon Rhondda Fach, Rhondda Member high vulnerability Secondary A Aquifer

Remediation/mitigation works	
Proposed mitigation measures	The potential mitigation measures proposed to remove unacceptable risks could include: » The installation of a 600mm cover system in gardens and 450mm in public open space, comprising a bonded geogrid break layer (e.g. TX160G), subsoil and a minimum of 150mm of topsoil; or: » Removal of all Made Ground to natural soils with placement of minimum 150mm topsoil. The methodology for the remediation should be presented in a Remediation Strategy, which will need to be submitted to the warranty provider and the regulatory authorities for approval. Verification reports by a competent independent geo-environmental specialist will be required following completion of any remedial works.
Earthworks	In order to undertake the proposed cut to fill earthworks and use of excavated materials in earthworks a site specific Earthwork Specification will be required to allow reuse of suitable materials along with the production of a Materials Management Plan and its approval by a Qualified Person. Verification reports by competent independent geotechnical specialists will be required following completion of any earthworks.
Waste management	Excavated soils to be disposed of as waste, are likely to be classed as non-hazardous.
Future considerations	
Further work	Following the ground investigation works undertaken to date, the following further works will likely be required: » demolition / refurbishment asbestos survey; » discussion with specialists with regard to invasive species present on site (cotoneaster stand) and other potential ecological receptors (e.g. reptiles); » discussion and agreement with utility providers regarding the materials suitable for pipework; » discussions with regulatory bodies and the warranty provider regarding the conclusions of this report; » provision of geotechnical design for the Category 2 (retaining walls.); » production of a Remediation Strategy and Verification Plan (and agreement with the regulatory bodies and the warranty provider); » production of a Materials Management Plan relating to reuse of soils at the site and import of soils to the site; » remediation and mitigation works; and » verification of the earthworks, remediation and mitigation works.

This Executive Summary forms part of Hydrock Consultants Limited report number (30603-HYD-XX-XX-RP-GE-1007) and should not be used as a separate document.

1. Introduction

1.1 Terms of reference

In February 2025, Hydrock Consultants Limited (Hydrock) was commissioned by Trivallis, (the Client) to undertake site investigation, comprising a review of existing Phase 1 Desk Study information and a Phase 2 supplementary ground investigation of the Phase 1a area at Penrhys Village, Ferndale, CF43 3RE. The site is located at Pen Tyntyla, Ferndale, CF43 3RE.

The site forms the northwestern corner of the wider Penrhys Village Redevelopment area.

The site is currently comprised of open grassland with distinct areas of low-rise residential housing focused in the centre and southeast of the site.

Hydrock understands that the proposed development is to comprise the erection of 89 new low rise houses and three apartment blocks with associated accessways, SuDS features, retaining walls, slopes and public open space. A proposed development layout (Stride Treglown Drawing 156757-STL-XX-XX-DR-A-09002_S0_P06) and numerous proposed site section options (156757-STL-XX-XX-DR-A-04000 to 04006) are presented in Appendix A.

The investigation works have been undertaken in accordance with Hydrock's proposal referenced (30603-HYD-XX-XX-FP-GE-1004 19th December 2024) and the Client's instructions to proceed (PO04700 dated 25th February 2025).

1.2 Objectives

The works have been commissioned to assist with the submission of the Phase 1a planning application and design of the proposed development.

The objectives of the Phase 1 Desk Study review are to review the existing preliminary Ground Model and an Initial Conceptual Site Model of the site to identify and make a preliminary assessment of potential geo-environmental and geotechnical risks to the proposed development and inform the scope and context of the Phase 2 investigation.

The objectives of the Phase 2 Ground Investigation are:

- to resolve geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study and Phase 2 Preliminary Ground Investigation Report by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023);
- to identify geo-environmental mitigation requirements to enable development to progress; and,
- to provide preliminary geotechnical recommendations for design
- to provide depth to bedrock contours to assist with the detailed design.

1.3 Scope

The scope includes a review of existing Phase 1 Desk Study reports and a Phase 2 Ground Investigation.

The scope of the Phase 1 Desk Study review comprises:

- a field reconnaissance (walkover) to determine the current nature of the site and its surroundings including current and former land uses, topography and hydrology;
- a review of previous investigations (Phase 1 and Phase 2) carried out at the site;

- presentation of the preliminary Ground Model representing ground conditions at the site;
- presentation of the initial Conceptual Site Model (iCSM), including identification of potential contaminant linkages;
- a qualitative assessment of geo-environmental risks identified; and
- identification of plausible geotechnical hazards.

The scope of the Phase 2 Ground Investigation comprises:

- a supplementary ground investigation including trial pitting and dynamic probing with rotary follow-on drilling to:
  - obtain data on the ground and groundwater conditions of the site;
  - allow collection of samples for geotechnical and chemical laboratory analysis;
  - allow geotechnical field tests to be undertaken;
  - install gas and groundwater wells;
- gas concentration and groundwater level monitoring;
- geotechnical and chemical laboratory analysis;
- updating of the preliminary Ground Model;
- preparation of a geotechnical risk register;
- presentation of an initial geotechnical design recommendations;
- formulation of an updated Conceptual Site Model (CSM), including identification of plausible contaminant linkages;
- completion of a generic quantitative risk assessment of identified chemical contaminants to establish 'suitability for use' under the current planning regime;
- discussion of potential environmental liabilities associated with land contamination (soil, water and gas); and
- identification of outline mitigation requirements to ensure the site is 'suitable for use'.

1.4 Available information

The following documents, reports etc pertaining to the wider Penrhys Village site have been produced by Hydrock for the Client and have been used in the preparation of this report:

- Hydrock Consultants Ltd., November 2023. 'Penrhys Village, Phase 1 Ground Conditions Desk Study' Ref: 30603-HYD-XX-XX-RP-GE-1001, for Trivallis;
- Hydrock Consultants Ltd., August 2024. 'Penrhys Village, Phase 2 Ground Investigation Report'. Ref: 30603-HYD-XX-XX-RP-GE-1003, for Trivallis;
- Hydrock Consultants Ltd., November 2024. 'Penrhys – Materials Management Overview'. Ref: 30603-HYD-XX-XX-RP-GE-1005, for Trivallis;

The information contained within the above desk study has been utilised particularly within Sections 2 to 5. The information within the Ground Investigation Report as referenced above is summarised in Section 2.4.1 and relevant data pertaining to the Phase 1a area utilised within the assessment of the site.

The following additional reports for the wider site, produced by Hydrock for Trivallis, have not been utilised within this report as the information presented is either presented within the above reports or pertains to areas outside of the Phase 1a development area:

- Hydrock Consultants Ltd., July 2023. 'Penrhys Village, Rhondda Cynon Taff Due Diligence Geo Review' Ref: 30603-HYD-XX-XX-RP-GE-1000, for Trivallis;

- Hydrock Consultants Ltd., March 2024. 'Penrhys Ground Conditions Abnormal Risk Review' Ref: 30603-HYD-XX-XX-RP-GE-1002, for Trivallis; and,
- Hydrock Consultants Ltd., September 2024. 'Penrhys Village Additional Groundwater Monitoring Note' Ref: 30603-HYD-XX-XX-RP-GE-1004, for Trivallis.

1.5 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised good practice, including (but not limited to) BS 5930:2015+A1:2020, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+ A2:2017 and EA LCRM (2023).

The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with potential geoenvironmental risks assessed qualitatively. This is done using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990). Potential geotechnical risks are also assessed from the Phase 1 desk study and site reconnaissance stage.

Phase 2 comprises intrusive ground investigation work and testing. The factual information from the desk study and the ground investigation are used to develop the Conceptual Site Model (CSM). This CSM is based on a ground model of the site physical conditions and an identification of the possible contaminant linkages. The CSM forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines. This GQRA might lead to more Detailed Quantitative Risk Assessment (DQRA).

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

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

Where relevant the relevant requirements of the current edition of NHBC Standards have also been applied.

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

2. Desk study review (and field reconnaissance)

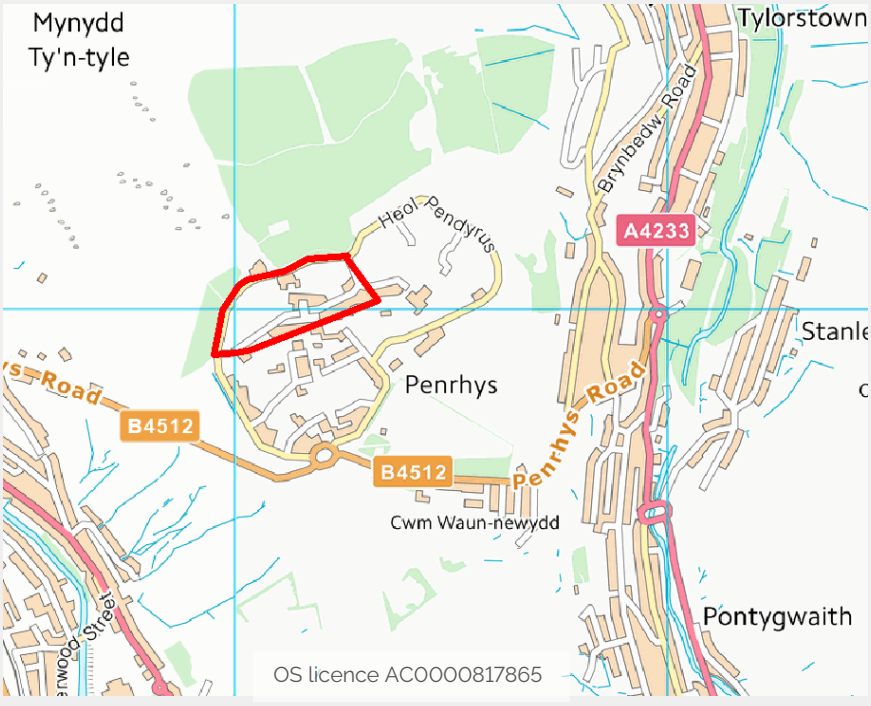
2.1 Introduction

Hydrock has undertaken an updated field reconnaissance survey on 18 February 2025 to visually assess potential geotechnical hazards, contaminant sources and receptors and check that the site conditions as reported in the previous desk study are similar to current conditions.

The information from the field reconnaissance survey and the review of the existing desk study report is summarised in the following sections.

2.2 Site referencing

Table 2.1: Site referencing information

Item	Description
Site name	Penrhys Phase 1a
Site address	Penrhys Village, Rhondda Cynon Taf, Heol Pendyrus, Ferndales, CF43 3RE.
Site location	The site is located in the northwestern corner of Penrhys Village and is centred around the National Grid Reference ST001950.
Site dimensions	The site is approximately 360m by 110m with a total area of c. 4ha.
Figure 2.1: Site location	

Item	Description
Figure 2.2: Site layout plan	

2.3 Site description and field reconnaissance information

Table 2.2: Site description

Item	Description
Site access	The site is accessed via Heol Pendyrus to the north and west, Pen Tyntyla to the southwest and Geol-Y-Waun to the southeast and east.
Elevation and topography	The site is formed of sloping ground, with the maximum elevation at the northern boundary c. 347 mAOD and the minimum elevation at the southern boundary c. 321 mAOD. Slope angles for the site are typically in the region of 10 degrees, with discrete areas of steeper sloping parts of the site up to 40 degree slopes.
Site boundaries and surrounding land use	The site is bound to the north and west by Heo Pendyrus, to the southwest by Pen Tyntyla and to the east and southeast by Geol-Y-Waun to the southeast and east. An area of coniferous forest lies to the north with a large boiler house to the immediate north of the western site boundary, open scrubland sloping steeply to the Rhondda Fawr valley below is present to the west and the wider Penrhys Village is present to the south and east.
Present land use	The site is currently comprised of large areas of open scrubland in the west and northeast of the site with low-rise residential housing in the centre and southeast of the site as shown in Figure 2.2.
Surface cover and vegetation	Surface cover is predominantly soft-standing grassland with areas of mixed scrub particularly in the east of the site. In the vicinity of the

Item	Description
	residential housing ground cover is generally hard-standing comprising concrete.
Evidence of contamination	With the exception of exposed made ground gravels in the northwestern corner of the site, no obvious signs of contamination were observed.
Ecology	Multiple vole burrows were noted across the grassland areas of the site, with evidence of small mammal grazing noted.
General site sensitivity	The site is of high sensitivity due to the residential land use and ecological receptors.

Selected photographs from the field reconnaissance are presented in Figure 2.3 to Figure 2.4

Figure 2.3: Open grassland in the west of the site

Figure 2.4:Eastern part of the site showing residential housing.

2.4 Previous investigations summary

2.4.1 Hydrock Ground Investigation Report August 2024

Hydrock were commissioned by Trivallis to complete a Phase 2 Ground Investigation of the wider Penrhys Village Development Area. Geotechnical Engineering Ltd (GEL) were engaged to complete the ground investigation and produce a factual report for the works.

The ground investigation comprised the following:

- 7 No. rotary cored boreholes
- 23 No. machine excavated trial pits
- 1 No. hand excavated trial pits
- 17 No. TRL dynamic cone penetrometer tests
- 5 No. BRE 365 infiltration tests within trial pits TP201, 204, 212, 216 and 219.

Groundwater and ground gas monitoring wells were installed within all rotary cored boreholes between 2.4m and 9.5m depth.

Ground conditions were found to comprise Made Ground to between 0.3m and 4.40m in the northern half of the site with Topsoil recorded in the south of the site to between 0.2m and 0.6m depth in the southern half of the site. Below the shallow soils, bedrock generally comprising moderately strong fine to medium sandstone was encountered to the full depth of the investigation (9.80m bgl).

It is considered that a number of strata labelled as Made Ground within the GEL logs are actually representative of weathered bedrock soils comprising orangish brown and grey brown sandy gravel of fine to coarse sandstone with medium cobble content and low boulder content. The above ground conditions describe that presented in the previous Hydrock report; however, it is considered that maximum Made Ground thickness is likely to be less than previously reported.

Groundwater was generally not encountered within the installed boreholes either during the intrusive investigation or subsequent monitoring. TP215 in the central western part of the site recorded a minor seepage of perched water at 2.50m bgl in the Made Ground.

BH307 in the extreme south of the wider south recorded groundwater between 2.50m and 7.00m bgl during post fieldwork monitoring. Gas monitoring of this location also returned elevated VOC concentrations of >100ppm. It was recommended that additional monitoring and groundwater sampling be completed to further understand the potential risk.

To understand the risk posed by potential asbestos containing materials utilised within the district heating network pipelines, numerous manhole covers were opened and samples of pipe materials were taken for asbestos screen testing. Asbestos was identified within pipe gaskets only in the form of asbestos cement.

The following conclusions and recommendations were made for the site:

- The use of shallow foundations, particularly where Made Ground was <2.50m thick.
- Where Made Ground is over 2.50m thick, either use deeper pad-like foundations (utilising concrete manhole rings with ring beams) or a turnover specification to remove obstructions and remove Made Ground to be utilised.
- An allowable net bearing pressure of 150 kN/m^2 for foundations up to 1.00m width.
- The made ground was found to be of low to medium volume change potential
- For road/pavement design a CBR of 3% was recommended.
- Design sulfate Class of DS-1 and ACEC Class of AC-1 were concluded for the Made Ground soils
- The site was considered suitable for conventional soakaway drainage provided soakage cells are placed into the natural Rhondda Member soils.
  - Infiltration rates of between 3.3 x10^{-6} and 8.3 x10^{-5}m/s were recorded
- Unacceptable risk to human health from the Made Ground soils beneath the road due to PAH concentrations.
- Low risk from ground gases with provision Characteristic Situation 1 condition concluded
  - Depleted oxygen recorded in a number of locations with concurrent elevated carbon dioxide.
  - BH307 encountered depleted oxygen with low levels of carbon dioxide and elevated VOC (c. 100ppm).
- Generally low risk to controlled waters from the site.

Additional works were recommended to further constrain the risk posed to identified receptors from the sources of contamination present on site once the final site layout is understood. Additional monitoring

of BH307 was also recommended to understand the potential risk associated with volatile contaminants.

2.4.2 Hydrock Additional Groundwater Monitoring Technical Note September 2024

Following identified VOC within the monitoring completed as part of the Phase 2 Ground Investigation, additional monitoring was recommended and completed at BH307 by Hydrock.

The additional monitoring involved the collection and testing of groundwater samples using low flow methodology, as well as additional ground gas spot monitoring.

Testing of groundwater samples recorded exceedances of heavy metals, fluoranthene and petroleum hydrocarbons (aromatic EC10-12, EC12-16, EC16-21, EC21-35 and aliphatic EC21-35). In addition, methylnaphthalene and 4-methylphenol was recorded.

The presence of methylnaphthalene indicates that a diesel or kerosene fuel source was responsible for the observed concentrations. As recorded concentrations generally reduced over the course of the monitoring to below the limit of detection, it was concluded that groundwater levels (and dilution) was the main driver for the recorded concentrations.

It was concluded that a minor point source of petroleum hydrocarbons was present but depleted by groundwater sampling with recorded concentrations representative of residual contamination of low risk to the controlled waters receptors. Heavy metal contamination was attributed to the intensive mining history of the local area as Made Ground leachate data did not indicate a source of heavy metals contamination on site.

Additional ground gas monitoring confirmed the original conclusion of Characteristic Situation 1. During the ground gas monitoring, VOC was found to be 100 times less than recorded during the Phase 2 Investigation. It was therefore concluded that no vapour risk was present on site and that any potential risk to human health was low.

2.5 Site history

Based on the desk study information reported in the Hydrock Desk Study (Section 1.4), the site comprised open fields and marshland from the earliest available historic maps, until the early 1970s when residential housing was constructed across the Phase 1a and wider Penrhys Village site. Demolition of numerous houses within the Phase 1a area and wider site occurred between 2000 and 2010.

The history of the surrounding area is similar to that of the Phase 1a area. Additional features of note include numerous quarries c. 200m west of the site and c. 750m east of the Phase 1a site, generally all noted to be disused from 1948 and the Pont-y-gwaith Colliery 500m east and the Pendyrus Colliery c. 850m northeast of the site.

2.6 Geology, Hydrogeology and Hydrology

2.6.1 Geology summary

Based on the information reported in the previous desk study and ground investigation, (Section 1.4), the site geology is reported to be:

Table 2.3: Published Geological Sequence

Artificial Ground			
Artificial Ground is not indicated to be present on site, although based on the site history, Made Ground is expected to be present in the vicinity of historical and current buildings, hardstanding, raised ground and infilled ground.			
Solid Geology			
Reference	Location	Stratigraphic Name	Description
1	On site	Rhondda Member	Green-grey lithic arenites with thin interbedded mudstone/siltstones and seatearth interbeds and thin coals.
Proven Ground Conditions			
Stratum	Depth encountered (m bgl) (range)	Thickness (m) (range)	Description
Made Ground	0.00 - 3.35	1.00 – 3.35	Building demolition rubble including brick, concrete and metal.
Rhondda Member	1.00 - 9.80	Not proven	Medium strong locally moderately weak fractured light grey fine to medium sandstone and weak thinly laminated dark grey mudstone with occasional coal laminae.
Naturally elevated elements			
No naturally elevated heavy metals are anticipated based on the geology.			

2.6.2 Hydrogeology

The Rhondda Member bedrock is classified as a Secondary A Aquifer. There are no active groundwater abstraction licences within 1km of the site and the site does not lie within a groundwater source protection zone.

Due to the lack of superficial deposits, the groundwater body is considered to be of high vulnerability.

Groundwater is anticipated to be influenced by topography and flow in a general southerly direction. The previous ground investigation did not encounter groundwater during the intrusive investigation with post-investigation monitoring recording groundwater in one borehole only in the extreme south of the wider site. It is therefore anticipated that groundwater is at >10m below ground level.

The Rhondda Member forms part of the South East Valleys Carboniferous Coal Measures groundwater body and its water quality is classified as 'poor' under the Water Framework Directive (WFD) Cycle 3 data.

A negligible risk from groundwater flooding is attributed to the site.

2.6.3 Hydrology

No waterbodies are identified within the site boundary.

Two unnamed inland rivers are present to the immediate north and c. 10m southwest of the site. A spring and inland river network that drain into the Afon Rhondda are present c. 250m southwest of the site.

The site is situated within the WFD catchment boundary for the Afon Rhondda Fach River some 850m east of the site. The extreme western part of the site is within the WFD catchment boundary for the Afon Rhondda some 650m to the west.

2.7 Mining or mineral extraction

The site lies within the Mining Remediation Authority's 'Coal Mining Reporting Area' but outside of a 'Development High Risk Area'.

A Consultants Coal Mining Report was obtained by Hydrock (presented and discussed within the Phase 1 Desk Study) which indicated that no known shallow workings of the nearest seams (No 2 Rhondda and Two Ft 2) which are present beneath the site at c. 180m and 400m below the site. It was previously concluded that any past coal mining below the site is at sufficient depth that it poses a low risk to any new development.

2.8 Waste management and regulatory information

There are no current or historical waste management sites recorded within 250m of the site.

Information provided in the previous desk study indicate the following significant regulatory controls in the general area of the site:

Table 2.4: Regulatory information within 250m of the site

Regulatory Data	Location	Details	Potential Risk	Comment
Discharge consents	215m west	Rees Street Pumping Station – sewage discharge	No	Downgradient of the site

No other regulatory control records are within 250m of the site boundary.

2.9 Radon and ground gas

The previous desk study indicates that the site is in a Radon Affected Area where recorded radon levels in 1-3% of homes are above the action level, but no radon protection measures are required for new buildings at this location in line with current guidance.

2.10 Unexploded ordnance (UXO)

The previous desk study indicates a low risk, and no further assessment is required with regard to UXO in relation to ground investigation. Further assessment may be considered prudent for construction activities.

3. Preliminary Ground Model

The preliminary ground model for the Phase 1a area is based on the information on the ground conditions presented in Section 2 and integrates site-specific data (where available) with regional geological desk-based information.

The preliminary Ground Model is discussed below.

Table 3.1: Preliminary Ground Model

Strata	Expected Thickness (m)	Description	Comments
Artificial Ground/Topsoil			
Made Ground	0.5 – 3.5	Highly variable building demolition rubble including brick, concrete and metal.	Anticipated to be of limited thickness in areas of hardstanding and at maximum thickness in areas of previously demolished housing.
Solid Geology			
Rhondda Member	>15m	Medium strong locally moderately weak fractured light grey fine to medium sandstone and weak thinly laminated dark grey mudstone with occasional coal laminae.	

The initial ground model comprises the Rhondda Member sandstone bedrock across the entire site overlain by variable thicknesses of Made Ground. The Rhondda Member forms part of the Pennant Sandstone which itself forms the Upper Coal Measures. Due to the site history and areas of demolition fill, depth to bedrock is noted to be highly variable, between 0.5m and up to 3.5m.

The Rhondda Member is classified as a Secondary A Aquifer and due to the lack of superficial deposits, the aquifer is considered to be unconfined. It is considered that recharge to the aquifer occurs locally with groundwater flow in a general southeastern direction towards the Afon Rhondda Fach. It is understood that groundwater is >10m bgl. It is anticipated that perched water may be encountered locally within the Made Ground deposits.

4. Ground hazards

4.1 Natural ground instability

Based on BGS ground stability records and previous investigations, the following risks are associated with ground instability:

- Low risk of shrink swell clays
- Negligible risk from running sands
- Negligible risk from compressible deposits
- Very low risk from collapsible deposits
- Very low risk from landslides
- Negligible risk from ground dissolution

4.2 Coal mining

A coal mining risk assessment was procured for the wider site. Two coal seams are present beneath the site, the No.2 Rhondda and the Two foot Nine seam. Due to depth of the seams beneath the site, c. 180m and 400m respectively, and limited thickness (<3ft) it was concluded that the potential for extensive workings at depth beneath the site was unlikely.

A number of roadways associated with the mining of the Two foot Nine seam are mapped beneath the site. However, due to the significant depth to the seam, no significant risk is present.

4.3 Preliminary geotechnical hazard identification

Potential geotechnical hazards were assessed as part of the previous desk study in accordance with the general requirements of ICE/DETR Document 'Managing Geotechnical Risk' and the HE documents CS 641 and CD 622.

The following geotechnical hazards were identified as plausible:

- Uncontrolled Made Ground (variable strength and compressibility)
- Soft/loose compressible ground (low strength and high settlement potential) (Made Ground)
- Variable lateral and vertical changes in ground conditions
- High sulfates in soils
- Adverse chemical ground conditions e.g. expansive slag (based on limited knowledge of Made Ground composition)
- Obstructions
- Slope stability issues – general slopes
- Slope stability issues – retaining walls

Following the Phase 2 ground investigation adverse chemical ground conditions was removed as a plausible risk.

4.4 Potential development elements affected

Development elements potentially affected by geotechnical hazards have been identified as:

- Building foundations.
- Building floor slabs.

- Roads and pavements.
- Services.
- General slopes.
- Retaining walls.
- Gardens.
- Construction staff, vehicles and plant operators.
- Concrete below ground.
- Insufficient fill to complete earthworks.

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

The above plausible geotechnical hazards and development elements affected have been carried forward for investigation and assessment.

5. Initial Conceptual Site Model and Preliminary Risk Assessment

5.1 Introduction

The initial Conceptual Site Model (CSM) and Preliminary Risk Assessment incorporates evidence from the site walkover, the Desk Study, and previous investigations carried out at the site. The formulation of an initial CSM is a key component of the LCRM methodology for assessing geoenvironmental risk and incorporates the Preliminary Ground Model of the site physical conditions (Section 5) and the identification of potential contaminant linkages.

The available information has used to identify geo-environmental hazards and to establish potential contaminant linkages based on the source-pathway-receptor (S-P-R) approach. A viable contaminant linkage requires all the components of an S-P-R to be present. If only one or two are present, there is no linkage, and no further assessment is required.

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

5.2 Potential contaminants

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

5.2.1 Potential on-site sources of contamination

- S01: Made Ground containing elevated concentrations of PAH and asbestos containing materials
- S02: Asbestos within existing buildings/structures
- S03: Asbestos containing materials associated with gaskets on pipe work of former district heating network
- S04: Petroleum hydrocarbons and VOC/SVOC from fuel leakages within the groundwater below the site
- S05: Ground gases from the decomposition of organic matter within the Made Ground

5.2.2 Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

5.3 Potential receptors

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

- Site end users (residents)
- Neighbours
- Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability
- Surface water: River Rhondda
- Surface water: Afon Rhondda Fach
- Ecology (mammals and reptiles)

5.4 Potential pathways

The following potential pathways have been identified.

- Direct ingestion of soil
- Inhalation of soil derived dust (outdoors)
- Inhalation of soil derived dust (indoors)
- Ingestion of soil attached to fruit/vegetables
- Ingestion of fruit/vegetables
- Dermal contact with dust derived from soil (indoors)
- Inhalation of soil vapours (indoors)
- Inhalation of soil vapours (outdoors)]
- Dissolved phase leaching from unsaturated soils
- Lateral migration of dissolved phase in groundwater
- Vertical migration of dissolved phase in groundwater
- Groundwater baseflow to surface water
- Surface water run-off
- Surface water drainage discharge
- LNAPL lateral migration
- DNAPL vertical migration
- Vertical migration of ground gases in unsaturated zone and ingress into building
- Lateral and/or vertical migration via preferential pathways (natural/anthropogenic)
- Inhalation of ground gases (indoors)
- Plant root uptake
- Dust deposition on leaves
- Gas migration in root zone
- Secondary poisoning

5.5 Summary of potential contaminant linkages

The above sources, pathways and receptors have been identified as part of the previously reported Preliminary Risk Assessment in accordance with Stage 1 of LCRM (2023). These are considered to be plausible and of moderate risk in the context of this site and the available information and have been carried forward for investigation and assessment.

Table 5.1: Initial CSM

Source	Pathway	Receptor	Risk Level	Comment
Made Ground containing elevated concentrations of PAH and asbestos containing materials	Direct ingestion of soil Dermal contact with soil Inhalation of soil derived dust (indoors and outdoors)	Site end users (residents) Neighbours	Low to moderate	Pathways all active in low-risk residential setting with private gardens. Marginally elevated PAH contamination previously recorded and potential for additional contamination to be identified with the supplementary investigation.

Source	Pathway	Receptor	Risk Level	Comment
Made Ground containing elevated concentrations of PAH and asbestos containing materials	Inhalation of ground gases (indoors) Vertical migration of ground gases in unsaturated zone and ingress into building Lateral and/or vertical migration of ground gases via preferential pathways (natural/ anthropogenic)			Ground gas pathways are also potentially active and with Made Ground deposits of >1m thick there is the potential for gas generation. Historical monitoring indicates limited ground gas concentrations present on site.
	Dissolved phase leaching from unsaturated soils Lateral migration of dissolved phase in groundwater Vertical migration of dissolved phase in groundwater	Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability		Unsaturated zone c. 8-10m thick based on groundwater levels, previous leachate data indicates that a number of contaminants are leachable from the Made Ground. Due to the high vulnerability of the aquifer, it is anticipated that vertical and lateral migration of contaminants is possible.
	Groundwater baseflow to surface water Surface water run-off Surface water drainage discharge	Surface water: River Rhondda and Afon Rhondda Fach	Low	No significant contamination encountered within the Made Ground. Considered that due to the distance to the receptors from the site, these pathways are limited, and attenuation and dilution will reduce any possible risk.
	Plant root uptake Dust deposition on leaves Gas migration in root zone Secondary poisoning	Ecology (mammals, reptiles and vegetation)	Low	No significant contamination encountered within the Made Ground.
Asbestos within existing buildings/ structures	Inhalation of asbestos fibres (indoors and outdoors)	Site end users (residents) Neighbours	Moderate	It is understood no asbestos survey has been completed for the existing buildings due to be demolished for the redevelopment. Risk level

Source	Pathway	Receptor	Risk Level	Comment
				due largely to the severity of exposure to asbestos. Risk can be mitigated through good working practices during removal.
Asbestos containing materials associated with gaskets on pipe work of former district heating network	Inhalation of asbestos fibres (outdoors)	Neighbours	Moderate	Risk level due largely to the severity of exposure to asbestos. Risk can be mitigated through good working practices during removal.
Petroleum hydrocarbons and VOC/SVOC from fuel leakages within the groundwater below the site	Lateral migration of dissolved phase in groundwater Vertical migration of dissolved phase in groundwater LNAPL lateral migration DNAPL vertical migration	Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability	Moderate	Previous investigations did not encounter any petroleum hydrocarbon or VOC/SVOC sources, however where present, groundwater did indicate potential sources of petroleum hydrocarbons up-gradient of BH307 in the extreme south of the wider Penrhys site.
	Groundwater baseflow to surface water Surface water run-off Surface water drainage discharge	Surface water: River Rhondda and Afon Rhondda Fach		Previous investigations did not encounter any petroleum hydrocarbon or VOC/SVOC sources, however where present, groundwater did indicate potential sources of petroleum hydrocarbons up-gradient of BH307 in the extreme south of the wider Penrhys site.

A summary of the plausible linkages is presented on the Initial Conceptual Site Model for the wider site provided in Appendix A (Hydrock Drawing 30603-HYD-XX-XX-RP-GE-1016).

5.6 Potential implications of climate change

Climate change has the potential to change the risk profile for conceptual site models and associated contaminant linkages. The impact of climate change on the CSM is site-specific, and a qualitative assessment of the potential impact of climate change on the CSM for this site is summarised below. The assessment has primarily utilised the guidance in Environment Agency (2010) and SoBRA (2022) which set out the UK context to climate change and land contamination. Both guidance documents advocate a "what if" scenario approach in the context of changes in ambient temperatures, an increase in the

frequency of extreme rainfall/storm events and heatwaves/droughts, and long-term changes in groundwater and sea levels.

Those "what if" scenarios that are relevant to this CSM are:

- Long-term decrease in rainfall leading to lower infiltration and fall in groundwater and surface water levels.
- Increased magnitude of extreme rainfall events leading to short-term surface flooding, and surface water run-off.
- Increased frequency and/or magnitude of storm events leading to short-term drops in barometric pressure and/or high winds.
- Occurrence of extreme cold and hot weather events leading to changes in ground conditions such as soil temperature, evapo(trans)piration, and soil moisture (for example freeze-thaw effects and desiccation), decreased infiltration and fall in groundwater and surface water levels.

In considering the potential impact of climate change, the following factors have been considered

- The design life of the proposed development is 100+ years
- The site is c. 500m from the nearest surface water location (River Rhondda)
- The site is not within an area of increased flooding projections
- The current depth to groundwater is >10m bgl
- The superficial deposits and underlying geology at the site are unlikely to be physically adversely affected by desiccation, subsidence or erosion.
- The UK Climate Predictions published by the Met Office indicate that over the lifetime of the proposed development average:
  - Precipitation is forecast to decrease by 4%;
  - Temperature is forecast to decrease by 2 to 4 degrees;
  - Groundwater recharge is forecast to decrease by 0.05mm/day.
- Potential changes in soil moisture levels and soil temperature are not likely to have a significant impact on contaminant fate and transport (mobility and degradation) noting that a rise in soil temperature will likely increase the volatility and solubility of contaminants and increase the microbial degradation of contaminants. A reduction in soil moisture may decrease microbial degradation and increase vapour and gas diffusion.

The foreseeable potential implications of these scenarios on the CSM are as follows:

- Drier soils leading to increased contaminant volatility within the Made Ground
- Less dilution of contaminants within the groundwater due to lower rainfall and groundwater recharge
- Reduced mobilisation of contaminants causing higher contaminant persistence within the soil from lower rainfall and temperatures.
- Increased extreme weather could lead to increased wind scour damaging capping systems
- Increased surface water flooding due to extreme weather events leading to damage of capping systems

For further details on the considerations made, refer to Table L.1 in Appendix J.

6. Ground investigations

6.1 Site works

The ground investigation works, including the rationale which was based on the findings of the preliminary risk assessment is summarised in Table 6.1. For the investigation rationale of the historical investigations, please refer to the historical reports in Section 1.4.

The Hydrock fieldwork took place between 18 and 28 February 2025. The ground investigation locations were surveyed in using a Total Station GPS survey instrument and are shown on the Exploratory Hole Location Plan (Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1021) in Appendix A.

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

The weather conditions during the Hydrock fieldwork and for the previous week were mixed with much rainfall in the first week of the works followed by generally dry conditions in the second. An amber weather warning for rain was in place on 23 February for the area with 95.4mm recorded between 9am and midnight. Average rainfall in February for the area was c. 50mm more than the long-term average.

Table 6.1: Summary of site works

Activity	Method	No.	Name	Depth Range (m bgl)	In situ tests	Rationale
Drilling, Pitting and Probing						
Boreholes	Dynamic sampler with rotary cored follow-on	3	BH_PH1a_201-203	7.00 to 8.00	SPT	To investigate depth to bedrock, provide information on strength profile of the ground, for collection of samples and installation of groundwater or ground gas monitoring wells.
Trial pits	Machine (13T excavator)	13	TP_Ph1a_101- 113	0.60 to 2.90		For general site coverage and collection of samples.
Probes	TRL dynamic cone penetrometer	11	DCP_Ph1a_101-113		California Bearing Ratio (CBR)	
Other Testing						
Infiltration	BRE 365	3	TP_Ph1a_103,109 and 111	1.95 to 2.40	Infiltration testing	Two runs completed in TP_Ph1a_103 and TP_Ph1a_111. One run completed in TP_Ph1a_109.

Wells for monitoring groundwater levels and ground gas concentrations were installed in all of the rotary cored boreholes. A summary of the monitoring well installations is presented in Table 5.3.

Table 6.2: Summary of monitoring installations

Location	Ground level (m OD)	Standpipe diameter	Screen top and base depth (m bgl)	Screen top and base elevation (m OD)	Strata targeted
BH201	324.20	50	0.50 – 1.00	323.7 – 323.2	Made Ground
BH202	324.93	50	1.00 – 2.00	323.93 – 322.93	Made Ground
BH203	340.65	50	5.00 – 8.00	335.65 – 332.65	Rhondda Member

6.2 Geo-environmental testing

6.2.1 Sampling strategy and protocols

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

No specific features were identified during the desk study as requiring targeted investigation and a reasonably even spacing was used.

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

6.2.2 Geo-environmental monitoring

Gas monitoring boreholes have been monitored on three occasions. The results are presented in Appendix E.

Groundwater level monitoring of boreholes has also been completed on three occasions. The results are presented in Appendix E.

6.2.3 Geo-environmental laboratory analyses

The chemical test certificates for testing undertaken as part of Hydrock's investigation are provided in Appendix F and summarised in the table below. Wherever possible, UKAS and MCERTS accredited procedures have been used.

The chemical test certificates for testing undertaken as part of historical investigations are provided in the relevant reports in Appendix B.

The geo-environmental analyses undertaken on soils are summarised in Table 6.3.

Table 6.3: Geo-environmental analyses of soils

Determinand Suite	Made Ground	Rhondda Member
Hydrock minimum suite of determinands for solids	11	2
Speciated aliphatic and aromatic banding Total petroleum hydrocarbons by HS-GC/MS and GC/FID (Hydrock Tier 2 TPH Suite)	1	-
Benzene, toluene, ethylbenzene and xylene (BTEX) by HS-GC/MS	1	-
MTBE (Methyl Tertiary Butyl Ether) by HS-GC/MS	1	-
Hydrock minimum suite of determinands for waters (soil leachate analysis)**	2	-
*Hydrock minimum soil suite comprises: As, B (water soluble), Be, Cd, Cr (total), Cr (VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulfide, pH, asbestos fibres, speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID), total phenols and fraction of organic carbon **Hydrock minimum water suite comprises: dissolved Ag, Al, As, Ba, B, Be, Ca, Cd, Co, Cr (total), Cr (VI), Cr (III) Cu, Fe, Hg, Ma, Na, Ni, Pb, Sb. Se, Sn, V, Zn; cyanide (total), cyanide (free), electrical conductivity, pH, sulphate as SO_4, chloride, fluoride, ammoniacal nitrogen as N, ammoniacal nitrogen as NH_3, ammoniacal nitrogen as NH_4, nitrate as N, nitrated as NO_3, nitrite as N, nitrite as NO_2, and bromate speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID) and total phenols.		

6.3 Geotechnical testing

The geotechnical tests undertaken by Hydrock are summarised in Table 6.4 and the test certificates are provided in Appendix D. Wherever possible, UKAS accredited procedures have been used.

The geotechnical tests undertaken as part of historical investigations are provided in the relevant reports in Appendix B.

Table 6.4: Summary of sample numbers for geotechnical tests

Test	Made Ground	Rhondda Member
Natural moisture content	6	3
Atterberg limits	6	3
Particle size distribution (wet sieve)	6	3
Sulfate and aggressive chemical environment classification for buried concrete classification (full BRE SD1 suite)	6	3

6.4 Constraints

The footprints of the buildings and areas of hardstanding in the immediate vicinity could not be investigated as most buildings were still in use, preventing intrusive ground investigation.

All exploratory works have been undertaken under the control of an ecologist. A stand of cotoneaster was identified by the ecologist in the centre of the western part of the site. Additionally, snowdrops were recorded along the western site boundary. Areas where exposed made ground was present at surface were given clearance of 2m to be protective of any potentially brumating reptiles.

7. Ground investigation records and data

7.1 Physical ground conditions

7.1.1 Summary of strata encountered

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

All relevant data from the Hydrock investigation discussed in Section 6 as well as any reliable data from previous investigations noted in Section Cross ref and discussed in Section 2.4 are used from this point forward.

It should be noted that information from locations within the wider Penrhys Village site adjacent to the Phase 1a area have also been utilised due to their proximity to the site. These are locations BH302B and TP208.

Details of the Hydrock ground investigation works are provided in the logs in Appendix C, previous data are provided in Appendix B**Error! Reference source not found.**, a summary of the ground encountered in the investigation is presented in Table 7.1 and the individual strata are described in the sections below. Relevant cross-sections are presented in Appendix A.

Table 7.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
Surface Cover – Concrete hardstanding (BH201 and BH202 only)	0.00	0.10 - 0.16	0.10 - 0.16	0.13
Surface Cover – Tarmacadam hardstanding (TP101 only)	0.00 – 0.14	0.08 – 0.25	0.08 – 0.11	0.095
'Topsoil' Made Ground	0.00	0.10 – 0.40	0.10 - 0.40	0.22
'General' Made Ground	0.10 – 0.40	0.60 – >3.00	0.60 – >2.70	1.29
Weathered Rhondda Member Sandstone	0.60 – 2.30	1.60 – 4.00	0.10 – 1.85	0.98
Rhondda Member Sandstone	1.60 – 4.00	>9.80	>6.70	Not proven

7.1.2 Surface covering

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

- Concrete hardstanding, covering approximately 15% of the site and noted to be in moderate condition with cracking and scars.
- Tarmacadam hardstanding, covering approximately 5% of the site (within roads only) and noted to be in poor condition with significant potholes and scars in the northwestern corner of the site).
- Structures (residential housing) covering approximately 20% of the site.
- Vegetation (grass, trees, brambles), covering approximately 60% of the site.

7.1.3 Hardstanding (concrete and tarmacadam)

The thickness of the hardstanding ranged from 80mm to 160mm, with an average thickness of 112mm being recorded. The tarmacadam was found to rest directly on a granular sub-base comprising sandstone gravel. The concrete was found to rest directly on the general Made Ground soils.

7.1.4 Made Ground

Below the surface covering, Made Ground was recorded across the entire site.

In general, there are two main types of Made Ground:

- 'Topsoil' Made Ground, where no hardstanding present at surface to between 0.10m and 0.40m depth, with an average thickness of 0.22m. Comprises a very soft to soft variably organic slightly sandy slightly gravelly clay with gravel of fine to coarse angular to subangular sandstone with occasional flint. With anthropogenic inclusions of gravel sized fragments of brick and concrete; and
- 'General' Made Ground, to depths of between 0.60m and 3.00m, with an average thickness of 1.29m. Comprises slightly gravelly sandy clay or sandy very clayey gravel with abundant demolition rubble (see section 7.1.4.1)

More details of the different Made Ground lithologies are given below where necessary.

7.1.4.1 'General' Made Ground

'General' Made Ground was encountered across the entire the site and generally comprises grey or dark brown variably gravelly clayey sand/sandy clay. Gravel generally comprised fine to coarse angular to subangular sandstone with low cobble content.

The 'General' Made Ground contained a number of anthropogenic inclusions associated with the demolition of former housing at the site and comprised gravel to cobble sized fragments of brick, concrete, rebar, scrap metal, breezeblock, asphalt and whole bricks with occasional timber, wire, glass, plastic, polystyrene and plastic bag fragments and igneous rock chippings.

Within a number of locations, boulder sized fragments of reinforced concrete were encountered, these were between 0.5m to 1.50m in size and encountered within TP_Ph1a_107, TP_Ph1a_110

Within TP_Ph1a_105, part of an old mobile generator was encountered.

A slight organic odour was noted in BH_Ph1a_201 associated with decomposing vegetation.

A number of locations encountered concrete slabs and brick walls at depth, considered to be associated with foundations from demolished houses, these are discussed in Section 7.2 below.

7.1.5 Weathered Rhondda Member Sandstone

Weathered Rhondda Member Sandstone was encountered underlying the Made Ground across the site and is between 0.1m and 1.85m thick, with an average thickness of 0.98m.

This generally consisted of completely weathered to partially weathered thinly to medium bedded sandstone, recovered as sandy very clayey gravel or very gravelly sand with medium to high cobble content of fine to coarse subangular to subrounded sandstone.

Occasional horizons of fine to coarse sand were encountered within the Weathered Rhondda Member Sandstone at 0.6m to 0.8m within TP_Ph1a_103.

7.1.6 Rhondda Member Sandstone

Rhondda Member Sandstone was encountered underlying the Weathered Rhondda Member Sandstone or Made Ground in a number of locations across the site and is over 6.70m thick (base not proven).

Within trial pits, Rhondda Member Sandstone was encountered at the base between 1.70m and 3.00m and prevented any further progress of the excavation in TP_Ph1a_103, TP_Ph1a_104A, TP_Ph1a_105, TP_Ph1a_108, TP_Ph1a_109. TP_Ph1a_111, TP_Ph1a_113, TP201, TP202

This generally consisted of partially weathered heavily fractured thinly to medium bedded greyish brown medium to coarse grained sandstone.

Fractures were generally observed to be vertical to 70°, closed smooth and often discoloured to an orangish brown or brown. Fractures were occasionally infilled for example in BH_Ph1a_201 between 5.00m and 8.00m with a c. 10mm open fracture with slightly gravelly sandy clay infill.

Thin to thick coal laminae were occasionally noted at depths of between 3.20m and 5.00m.

BH_Ph1a_202 and BH_Ph1a_203 encountered a coarse grained sandstone with occasional gravel of subrounded to rounded wood and petrified wood with occasional voids c. 50mm diameter between 6.30m and 7.10m. Within BH_Ph1a_203 this also occurred with numerous coal seams c. 5-10mm thick.

Table 7.2: Fracture Index Summary

Borehole	Depth	Minimum	Modal	Maximum
BH_Ph1a_201	2.00 – 2.50	NI	10	20
	2.50 – 3.50	10	30	80
	3.50 – 5.00	NI	20	130
BH_Ph1a_201	5.00 – 5.50	NI	40	90
	5.50 – 6.20	10	80	190
	6.20 – 6.50	NI	50	80
	6.50 – 8.00	5	40	130
BH_Ph1a_202	3.80 – 4.10	60	60	80
	4.10 – 5.00	30	40	130
	5.00 – 6.50	25	50	80

Borehole	Depth	Minimum	Modal	Maximum
BH_Ph1a_203	2.30 – 3.00	20	20	80
	3.50 – 4.50	10	40	90
	4.50 – 5.20	10	20	40
	5.20 – 6.00	5	100	160
	6.00 – 7.10	40	50	120
	7.10 – 7.40	70	100	180
	7.40 – 8.00	30	30	130
BH301	4.30 – 7.60	NI	80	190
	7.60 – 3.30	NI	40	230
BH302B	3.00 – 5.20	NI	NI	50
	5.20 – 6.35	NI	45	100
	6.35 – 9.50	NI	140	280

7.2 Obstructions

Obstructions were encountered in a number of trial pits during the investigation. These intrusive locations are summarised in Table 7.3.

Table 7.3: Obstructions encountered

Stratum	Location	Depth (m bgl)	Description
Made Ground	TP_Ph1a_101	3.00	Concrete slab
	TP_Ph1a_102	1,00-1.70 1.70	Brick wall Concrete slab
	TP_Ph1a_104	0.55 – 0.80 0.95 1.10	Concrete slabs 'stepping down' in northern end of pit Concrete slab in southern end of pit Orange warning table and yellow, plastic gas pipe
	TP_Ph1a_105	0.60 – 1.70	Brick wall (footing) in northern end of pit
	TP_Ph1a_106	0.60 – 1.70 1.80	Brick foundations in eastern and western side of the pit Concrete slab over pea shingle at base (possible buried service)
	TP_Ph1a_110	1.98	Concrete slab
	TP_Ph1a_112	0.60	Pea shingle at base (possible buried service)

Stratum	Location	Depth (m bgl)	Description
	TP202	0.40 – 0.90 0.90 – 1.20	Brick wall in northern face of pit Concrete footing in northern face of pit directly below brick wall
	TP207	1.20	20mm diameter electricity cable (street lighting)
	TP207A	0.40 – 1.10 2.40	Concrete footing in southern face of pit Concrete slab

7.3 Soil Organic Carbon Content

Recorded soil organic content for each stratum is summarised in the Table below:

Table 7.4: Soil organic content summary

Stratum	FOC (%)		SOM (%) (calculated from FOC x 172 or TOC x 1.72)	
	Range	Average	Range	Average
Made Ground	0.006 – 0.05	0.014	0.5 – 8.62	2.37
Weathered Rhondda Member Sandstone	0.007 – 0.015	0.011	1.12 – 2.59	1.67

7.4 Groundwater

7.4.1 Groundwater observations and levels

Groundwater was not encountered during the investigation; however, seepage was note within the Made Ground soils between 0.5m and 0.9m in TP_Ph1a_109 following periods of heavy rain. This was concluded to represent surface water run-off/perched water only.

Groundwater levels recorded during post-fieldwork monitoring are summarised in Table 7.5.

Table 7.5: Groundwater level data summary

Stratum	Date range	Location	Post-fieldwork monitoring	
			Depth to groundwater (range) (m bgl)	Groundwater elevation (range) (m bgl)
Made Ground	17/05/24 – 19/03/25	BH_Ph1a_201	0.27 – 0.70	323.93 – 323.5
		BH_Ph1a_202	1.65 – 1.72	323.29 – 323.22

The above recorded groundwater levels from post-fieldwork monitoring are considered to represent perched groundwater within the Made Ground, rather than actual groundwater depths within the Rhondda Member Aquifer.

7.4.2 Infiltration tests

The results of the infiltration testing undertaken are summarised in Table 7.6. The results sheets are presented in Appendix D.

Testing was carried out in accordance with Hydrock's 1-day assessment methodology. This is in general accordance with BRE Digest 365 (BRE DG 2016) where infiltration rates allow three test runs during a working day (or where there is no infiltration), but where low infiltration rates were encountered the available time may not have been sufficient to fully comply with the BRE test method (i.e. three runs of the test).

Table 7.6: Infiltration test results

Stratum	Location	Depth to base of pit (m bgl)	Infiltration rate* (m/s)			
			Run 1	Run 2	Run 3	Range
Weathered Rhondda Member	TP_Ph1a_103	1.90	$5.04x10^{-6}$	$5.84x10^{-6}$	-	$5.04 – 5.84 x10^{-6}$
	TP_Ph1a_109	2.40	$2.94x10^{-6}$	-	-	-
	TP_Ph1a_111	2.40	$7.06x10^{-6}$	$5.45x10^{-6}$	-	$5.45 – 7.06 x10^{-6}$
	TP201	3.00	Insufficient water intake to calculate infiltration.			

*Where less than three tests were possible in a particular location the results provided should be considered indicative only and should not be used for design purposes. If infiltration is critical to the development of the site, multi-day infiltration testing should be undertaken.

7.5 Ground gases (carbon dioxide and methane)

Records from the gas monitoring boreholes are presented in Appendix E and summarised in Table 7.7.

Six monitoring visits of BH301 and BH302 were completed in 2024. An additional three monitoring visits were undertaken in the Hydrock 2025 post-fieldwork monitoring programme.

Table 7.7: Range of ground gas data

Stratum	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Steady flow rate (l/hr)	Comment
'General' Made Ground	0.0	0.0 – 2.9	12.6 – 20.5	-0.4 – 0.1	The readings for BH201 taken on 06/03/25 have not been included due to the response zone being flooded

7.6 Updated ground model

The ground conditions were consistent with those anticipated from the published records, with the addition of a weathered horizon of the Rhondda Member sandstone immediately below Made Ground

and above the competent Rhondda Member bedrock. The succession of strata was described as follows:

- Surface covering – hardstanding or 'Topsoil' Made Ground to a maximum depth of 0.3m; over,
- 'General' Made Ground to a maximum depth of 3.35m; over,
- Weathered Rhondda Member Sandstone to a maximum depth of 4.00m; over,
- Rhondda Member Sandstone to the full extent of the excavation.

Geological cross-sections are shown in Figure A.1 and A.2 in Appendix A.

8. Geotechnical data

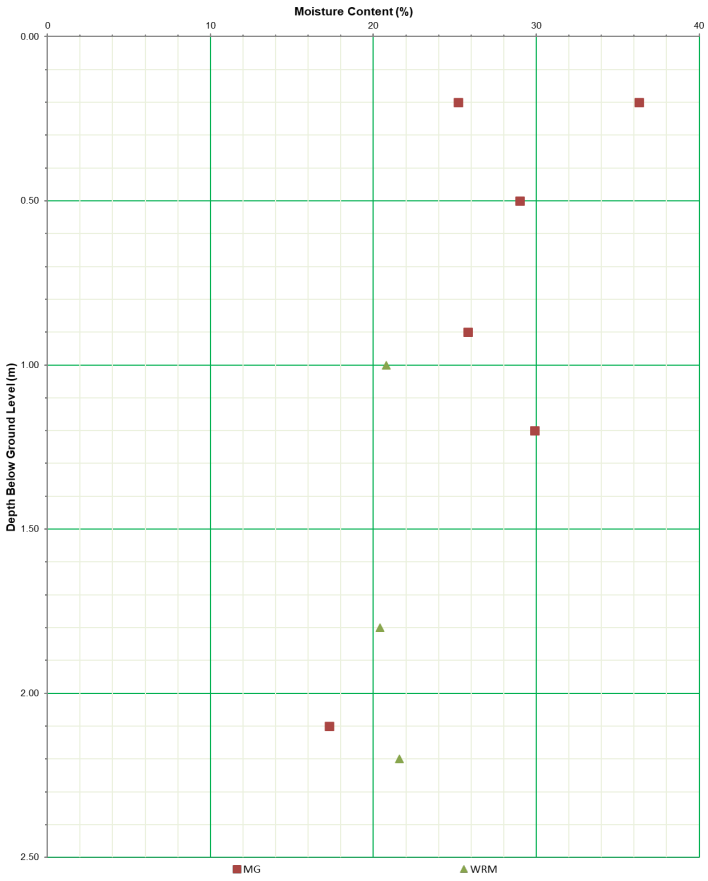
8.1.1 Introduction

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

8.1.2 Water Content

Table 8.1: Water Content

Stratum	No of Tests	Natural Water Content Range (%)	Average Water Content (%)
Made Ground	5	17.3 – 36.3	27.25
Weathered Rhondda Member Sandstone	3	20.4 - 21.6	20.94



Water content is shown to generally decrease with depth of sample taken (Figure 8.1).

Water content in the Made Ground appears to be depth related, whereas the water content of the Rhondda Member soils is consistent with depth.

Figure 8.1: moisture content vs depth graph

8.1.3 Plasticity

The volume change potentials in terms of NHBC Standard (Chapter 4.2) with respect to building near trees have been determined from the results of plasticity index tests on samples of soil. These are summarised in Table 8.2.

Table 8.2: Volume change potential

Stratum	No. of tests	Plasticity Index			Modified Plasticity Index			Plasticity designation	Volume Change Potential
		Min.	Max.	Av.	Min.	Max.	Av.		
Made Ground	6	24	41	32	2.4	20.4	9.2	Medium to high	Low to Medium
Weathered Rhondda Member	3	19	30	25	3.3	15.9	9.0	Medium	Low

8.1.4 Particle size distribution

Particle Size Distribution test (PSDs) results are summarised in Table 8.3 and summary descriptions and PSD plots of the material analysed are presented in Appendix D.

Table 8.3: PSD results summary

Stratum	No. of tests	Silt/Clay %	Sand %	Gravel %	Cobble/Boulder %	General description
Made Ground	12	3 – 18	7 – 23	51 – 85	0 - 25	Consistent with field descriptions.
Weathered Rhondda Member	5	6 - 19	7 - 24	31 - 74	0 - 52	Consistent with field descriptions.

8.1.5 Relative density

Table 8.4 summarises information pertaining to the relative density of the granular soils according to geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. SPT, CPT, dynamic probe correlation). A SPT 'N_{60}' value versus depth profile is summarised in Figure 8.2. Plots are presented in Appendix D.

Table 8.4: Relative density results and derived values

Stratum	No. of tests	Method	SPT N_{60} (N-value) (Range)	phi' (°)
Made Ground	6	SPT	9 – 37	30
Weathered Rhondda Member	4	SPT	36 – >50	38
Rhondda Member	20	SPT	>50	-

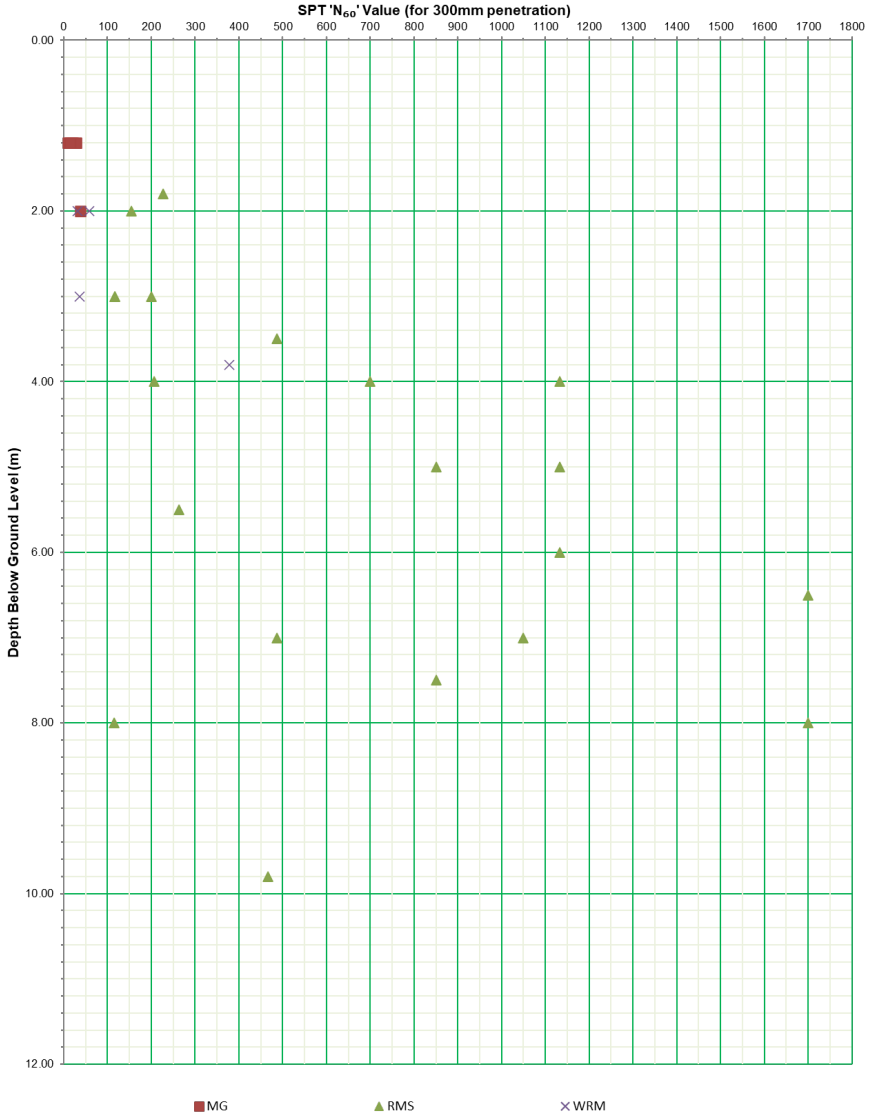


Figure 8.2: SPT N_{60} vs depth graph

8.1.6 Subgrade stiffness

The subgrade stiffness (CBR and Subgrade Surface Modulus) results are summarised in Table 8.5. The equilibrium CBR should be demonstrated on site prior to construction and remedial measures taken if it is not achieved.

Table 8.5: CBR results and derived values

Stratum	No. tests	Method	CBR (%)[1] (Range)	Subgrade Surface Modulus E (MPa)[2] (Range)
Made Ground	6	in situ TRL DCP probe[1]	2 - 86	27.4
1. Where using the CD225 method, 'E' has been back calculated from the Equivalent CBR using Equation 2.4.				

Where CBR is recorded in excess of 100%, this has been disregarded as it is concluded to represent obstructions (e.g. concrete) within the Made Ground rather than the subgrade surface modulus.

Recorded CBR for layer 1 of 0 as shown in the full results in Appendix D have not been included in the above as these are considered to represent the veneer of 'topsoil' Made Ground which at the time of testing were fully waterlogged.

8.1.7 Sulfate content

In accordance with BRE (Special Digest 1), the Design Sulfate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 8.7. The assessment summary sheets are presented in Appendix D.

Table 8.6: Aggressive chemical environment concrete testing results

Stratum	No. tests	Water Soluble sulfate (mg/l SO_4)	Total Potential Sulfate	pH
Made Ground	6	309	0.6	8.4
Rhondda Member Sandstone	5	108	0	7.3

Table 8.7: Aggressive chemical environment concrete classification

Stratum	No. tests (soil)	DS	ACEC
Made Ground	6	DS-1	AC-1s
Rhondda Member Sandstone	5	DS-1	AC-1s

8.1.8 Intact material strength - rock

Table 8.8 summarises information pertaining to the strength of the intact rock material (not rock mass) according to geological stratum and, if applicable, weathering zones or other variations within particular strata.

Factual results are summarised for laboratory and field tests. Where point load index tests are used to infer unconfined compressive strength (UCS), this is also tabulated. Rock strength terms follow the method of BS EN ISO 14689-1:2003.

Care should be exercised in using these assumed rock strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing is required for certain purposes. The reader should refer to the original test results in Appendix D. Note also that rock mass properties, rather than intact rock material properties, may be more suitable for design purposes.

Table 8.8: Intact rock strength results and derived values

Stratum	No. of tests	Point load index (Range)		UCS (MPa) (range)	Method
		Is	$Is_{(50)}$		
Rhondda Member Sandstone	5	0.61 - 2.08	0.88 – 5.86	21.12 – 140.64	Point load correlation (using factor of 24 from wider site data and UCS test data)

8.2 Derived values of ground properties

For design of Category 1 structures (foundations) in accordance with BS EN ISO 1997-1 (EC 7), the geotechnical parameters given in **Error! Reference source not found.** can be used for design.

These property values have been determined from laboratory testing, in situ testing and by professional judgement using published data together with knowledge and experience of the ground conditions. Care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing is required for certain purposes. The reader should refer to the original test results summarised in Section 7 and provided in Appendix C and Appendix D.

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

Table 8.9 provides characteristic geotechnical values to assist the designer. These are based on laboratory testing, in situ testing and by professional judgement using published data together with knowledge and experience of the ground conditions. Care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing are required for certain purposes. The reader should refer to the original test results summarised in Section 7 and provided in Appendix D.

Table 8.9: Characteristic geotechnical values

Parameter Stratum	Bulk unit weight kN/m³	Effective angle of internal friction °	Effective cohesion kN/m²	CBR %	Concrete classification
	γ [α]	φ' [b c h]	c' [d]		
Made Ground	18	30	-	2	DS-1
Weathered Rhondda Member (soil)	20	38	-	-	DS-1
Rhondda Member (Sandstone)	20	27	2		

a Measured as part of the triaxial strength test and estimated based on the recommendations of BS 8004-2015.

B Internal friction (φ') values for the granular in situ material derived from SPT data following the recommendations of Peck et al., (1967).

C Internal friction (φ') values for the cohesive in-situ material derived from BS 8004-2015, where φcv' is derived from plasticity index. The use of φcv' in the analysis is considered to provide a conservative estimate of φ'.

D BS 8002:1994 Code of practice for Earth retaining structures, British Standards institution.

E Site measurements and laboratory data.

F Laboratory data.

G Based upon the equilibrium long term CBR from DMRB IAN 73/06 Rev 1 Table 5.1.

h lower bound value for sandstones

9. Geotechnical assessment

9.1 Geotechnical categorisation of the proposed development

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

The proposed development is to comprise low rise (2 to 3 storey) residential dwellings, with associated gardens, Public Open Space and infrastructure. A preliminary review of the proposed site cross sections indicates up to 3.0m of cut and 2.5m of fill, with a significant number of retaining walls across the site as part of re-levelling in between development platforms. In addition, a review of the surface water drainage strategy indicates surface water will be retained in two surface water attenuation ponds located in the west of the site.

For the purposes of this investigation, the proposed foundations for the low rise housing have been classed as Geotechnical Category 1.

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

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

Following ground investigation and as part of the assessment provided in the following section, the preliminary geotechnical hazard identification undertaken in Section 4 has been updated.

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

9.2 Groundwork

9.2.1 Site preparation

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

Buried obstructions were encountered during this investigation associated with foundations of old buildings, services etc., and there is a possibility of further such obstructions being encountered.

A Cotoneaster stand was noted to be present in the western part of the site. Allowance for the removal of this should be made.

9.2.2 Groundworks

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

Significant collapse of trial pit faces was noted during and following trial pit excavation. This was noted particularly in the Made Ground where large cobbles and boulder sized concrete and brick wall sections were encountered. This was observed particularly in the western half of the site, where generally larger diameter demolition rubble was encountered.

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

Temporary trench support, or battering of excavation sides, is recommended for all excavations that are to be left open for any length of time and will definitely be required where man entry is required. Particular attention should be paid to excavation at, or close to, site boundaries, adjoining existing roads, structures and buildings, where collapse of excavation faces could have a disproportionate effect.

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

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

Based on site observations, the rate of perched water ingress to the proposed excavations is likely to be slow. In these circumstances, groundwater control by sump pumping is likely to be sufficient.

However, it should be recognised that groundwater levels may vary from those at the time of the investigation, for example in response to seasonal fluctuations and the timing of construction may dictate the extent of groundwater control required.

Any water pumped from excavations may need to be passed via settlement tanks (to reduce suspended solids) before being discharged to the sewer. Discharge consents may also be required.

9.2.3 Earthworks/reuse of site-won materials

Whilst no specific earthworks testing has been undertaken, it is understood limited cut to fill will be required. Review of geotechnical data (see Section 8 and Appendix D) coupled with Hydrock's experience, indicates that:

- following processing to remove oversize and deleterious material the Made Ground should be suitable for reuse as general fill;
- the soils of the River Terrace Deposits are likely to be Class 1A or 1C (granular) General Fill;

Table 9.1: Preliminary earthworks assessment

Stratum	Proposed end use	Preliminary classification (SHW Series 600)	Comment	Suitability for improvement by the inclusion of binders
Made Ground	External Areas	Class 1 General fill	Processing to remove oversize and deleterious material required.	May be suitable subject to further detailed design and testing.

Stratum	Proposed end use	Preliminary classification (SHW Series 600)	Comment	Suitability for improvement by the inclusion of binders
Weathered Rhonda Member	External Areas	Class 1A General Fill Class 1C General Fill		Likely to be suitable.

The earthworks may need to be undertaken under a Materials Management Plan (see Section 11).

Before the use of hydraulic binders is approved, comprehensive testing will need to be completed by a specialist Contractor to satisfy both themselves and the Engineer of the suitability of the soils for treatment and to confirm that the requisite end-performance of the material is achievable. In all instances where improvement by the inclusion of binders is considered, a mix design is required and as part of this design, samples should be checked for swelling, even where very low sulfate values are recorded.

Where it is proposed to reuse site won materials as an engineered fill it will be necessary to develop an appropriate Site Specific Earthworks Specification. The basis for the Specification should be BS 6031:2009 and the latest version of the SHW, Series 600 Earthworks. Once site proposals have been further defined more specific consideration will need to be given to the reuse of materials and reference should be made back to Hydrock.

9.3 Slope stability

There are a number of significant slopes on site between flat plateaus from former housing development which are between 1:2 and 1:3. No formal slope stability assessment is deemed necessary at this stage for the existing slopes.

The use of retaining walls and steepening of slopes are required to re-create flat development plateaus for the proposed development. Separate geotechnical design will be required to fully assess slope stability for the proposed slopes once the design is finalised.

9.4 Retaining walls

With regard to the proposed retaining walls, Hydrock understand there will be a number of significant retaining walls (in the order of 3 to 4m retained height) in the central and northern part of the site, and a number of smaller (up to 2m retained height) in the southern part of the site, which will retain both cut soils and placed soils.

At this initial stage, it is recommended that all retaining walls be founded onto competent bedrock.

Due to the amount of cut and fill, and areas to be retained, all proposed retaining walls are considered to be Category 2 structures and further geotechnical design will need to be considered. The designer is referred to characteristic values provided at Table 1.2.

No formal proposals for retaining wall types have been issued at this stage, although crib-lock walls have been suggested as a possible solution. Hydrock are of the opinion that Criblock walls would not be suitable in this situation and Hydrock have been commissioned to complete a retaining wall options

appraisal, separate to this GIR, that is to assess the proposed levels and layout of retaining structures in more detail.

With regard to the retaining walls, based on ground conditions and the assumption that they are to be founded on the competent bedrock, the structures could comprise:

- driven sheet piles;
- contiguous or semi-contiguous piled wall;
- preformed concrete retaining wall;
- cast in-situ concrete retaining wall; or
- gabion walls with reinforcement.

For the smaller retaining structures (<2m tall) it may be possible to construct these as gabion walls.

The above recommendations are all subject to further assessment and following detailed design may not be suitable.

It is recommended that all retaining walls are individually designed using site specific design criteria, assessed as part of the required geotechnical design. Associated as-built records will be required for verification purposes.

Allowance should be made in the design of the retaining walls for adequate drainage behind the structure, or for water seepage through the face of the wall. The overall stability of the retaining wall is not considered in this report. The stability of the retaining wall should be considered in the design process.

There is a risk that the engineered fill soils will settle over time and under additional loads due to the proposed land raising. As such retaining structures should be founded in the competent bedrock.

Care will need to be taken to ensure that any works close to the site boundaries will not destabilise or cause damage to neighbouring properties including the existing boundary walls and fences. A structural survey is recommended to ensure that existing walls will not be adversely affected.

9.5 Foundation recommendations

This section provides recommendations for the foundations for houses, garages and related buildings as indicated in the Stride Treglown Phase 1A – Proposed WIP Site Plan Key ref. 156757-STL-XX-XX-DR-A-09003_S0_P06.

The recommendations in this report are based on the current NHBC Standards (2024).

The houses and flats proposed for the site are considered to Geotechnical Category 1. Preliminary foundation recommendations for the foundations for houses and related buildings in this section are based on the geotechnical parameters provided in Section 1.2.

The safe bearing pressures for foundations quoted for Category 1 structures in this report take into consideration traditional factors of safety against the risk of shear failure of the ground and should prevent undue or excessive total and differential settlement from the anticipated structural loadings.

9.5.1 Shallow Foundations

On the basis of the ground conditions which generally encountered <2.5m of Made Ground over shallow Rhondda Member bedrock (with a c. 1-2m thick completely weathered soil horizon at the top) indicated from the current [and previous] investigations, shallow foundations in the form of pads or trench fill foundations are recommended.

Where Made Ground is greater than 2.5m thick, alternative foundation methodology should be considered for example:

- Excavation and replacement of the Made Ground with appropriate structural fill
  - Specification for structural fill would be required
- the use of concrete manhole rings placed onto the Rhondda Member connected with ring beams; or
- turn over specification for the Made Ground
  - to remove obstructions and remediate Made Ground for use as structural fill.
- It is recommended in the first instance that where possible, all foundations are founded through any Made Ground into the competent Rhondda Member sandstone bedrock.

9.5.2 Trench fill and pad foundations

Based on the proposed development plan (Drawing 156757-STL-XX-XX-DR-A-09003_S0_P06.:

- Pad-like manhole ring foundations are considered suitable in areas where Made Ground or filling of the site is greater than 2.5m.
- Strip / trench fill foundations are considered suitable for all proposed buildings up to 3 stories in height.

All foundations should be founded at least 300mm into the medium dense (or better) sands and gravels of the Weathered Rhondda Member or directly onto the competent sandstone at c. 1.0-1.5m depth.

A safe net bearing pressure of 150N/m^2 for a pad foundation of 1.0m by 1.0m and for 1m wide strip / trench fill founded in the medium dense to dense weathered Rhondda Member or in the competent Rhondda Member bedrock is considered appropriate.

Based on the NHBC volume change potential (low), the minimum founding depth for pad, strip or trench fill foundations is 0.75m below final ground level, or to below the base of the Made Ground whichever is deeper.

Where foundation depths are stepped, for instance, in trench fill and strip foundations to match changes in depths due to ground conditions, the steps should be designed in accordance with the requirements of the NHBC Standards.

A Depth to competent bedrock plan (Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1022) is provided in Appendix A. This plan does not take into account the depth influence of trees as this forms part of the design.

If trees are to be removed, the roots should be grubbed out and foundations extended to below the zone of disturbance created by this activity and to below any remaining root hairs.

Deepening of foundations in accordance with NHBC Standards will be required where foundations are within the zone of influence of existing, removed or proposed trees and proposed shrub planting. A tree survey should be undertaken by an arboriculturist in accordance with BS 5873:2012 to identify the type, and height of existing trees on the site and including any off-site trees, which could have an effect on foundation design.

Where trench fill foundations are within the zone of potential desiccation from trees and are deeper than 1.5m bgl, a suitable compressible material or void former will be required on the inside faces of foundations to external walls and beneath ground bearing floor slabs.

Excavation of strip / trench fill and pad foundations in excess of 2.50m bgl is unlikely to be economical and may be impracticable to undertake due to loose Made Ground which could result in trench collapse.

However, if trench fill foundations in excess of 2.50m depth are proposed, they should be designed by a Structural Engineer in accordance with the requirements of the NHBC Standards (Chapter 4.2.8) and NHBC Technical Requirement R5. In addition, Hydrock recommends that the design of foundations deeper than 2.50m should take into account soil desiccation risk from plot specific testing if within the influencing distance of trees.

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

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

Groundwater monitoring indicates the presence of a perched groundwater table. Any water that collects at the base of the foundation excavations should be readily removed by pumping from a sump in the base.

9.6 Ground floor slabs

In accordance with the NHBC standards, as Made Ground greater than 0.6m thick are present at the site, it is recommended that suspended floor slabs with a void be adopted.

Slabs without a void (ground bearing or suspended cast *in situ* onto the ground) may be used if all of the following criteria are satisfied:

- the foundation depth (such as due to the influence of trees) is less than 1.5m;
- any fill is suitable, well-compacted granular material and less than 0.6m thick;
- it is demonstrated that the soils are not desiccated and are at their equilibrium moisture content; and
- ground floor construction is not undertaken when the surface soils are seasonally desiccated (i.e. during summer and autumn), unless NHBC is satisfied the soil is not desiccated.

Ground floor slabs should be designed to incorporate any gas mitigation measures that may be required, as discussed later within this report.

9.7 Roads and pavements

Based on the test results and subject to *in situ* testing during construction, it is considered likely an equilibrium CBR of 2% will be achievable over the majority of the site, particularly where underlying bedrock is present near surface.

Proof rolling of the formation level will be required, and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rainwater and the surface sealed to limit infiltration.

Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable

specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with CD225 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

Where the CBR is found to be less than 2%, the sub-grade may be unsuitable for both the trafficking of site plant and as support for a permanent foundation, without improvement works being undertaken. Improvement works should be carried out in accordance with DMRB IAN 73/06 Rev 1 Chapter 5. In summary, consideration may be given to the following potential remedial techniques:

- excavation and re-engineering or replacement of weaker soils;
- the inclusion of geosynthetic reinforcement within the unbound layers of the capping and sub-grade;
- where granular soils are present, de-watering and re-engineering the formation.

9.8 Drainage

Indicative infiltration rates for the ground investigation are presented in Appendix D and are summarised in Section 7.4.2.

The ground model indicates that permeable stratum Rhondda Member Sandstones underlie the entire site as per cross section line 1 and 2 (Appendix A). The designer will need to take care in the design to ensure that the base of the soakaway is within permeable strata. In addition, the designer should consider the effects of soakaways on water levels and the potential for increased infiltration to cause spring-lines down slope.

Soakaways or infiltration as part of a Sustainable Urban Drainage System (SUDS) is considered suitable for the site based on the tested infiltration rates, subject to detailed drainage design by a specialist.

Infiltration rate testing indicates soakaways or infiltration as part of a Sustainable Urban Drainage System (SUDS) are potentially suitable for the site, subject to detailed drainage design by a specialist. However, the designer should note that whilst the infiltration tests indicate infiltration may work in principle, there is sloping ground below the level of proposed infiltration, and this could result in unintended break-out of water at the ground surface. During the design process, the designer will need to undertake more detailed consideration of the effects soil infiltration drainage would have on [possible areas affected by instability of breakout e.g.] the adjacent sites down slope of the site.

9.9 Buried concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005) and the information presented in Section 8.1.7:

- The shallow soils (Made Ground and Rhondda Member) can be classified as Design Sulfate Class DS-1 and ACEC Class AC-1s.

The designer should check and confirm the classification of concrete using the information presented in Section 8.1.7 and Appendix D during the design.

10. Geo-environmental assessment

10.1 Objectives

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

- review the conceptual site model following ground investigation to determine whether identified sources, pathways and receptors should be discounted or retained for further assessment;
- undertake a generic quantitative risk assessment of identified sources in accordance with LCRM using published generic assessment criteria;
- screen out contaminant linkages that do not have a potentially unacceptable risk to defined receptors;
- identify whether the ground conditions are suitable for the proposed land use from a land contamination perspective; and,
- identify the remaining contaminant linkages that potentially pose an elevated risk or are associated with a level of uncertainty that warrants further consideration.

10.2 Updated conceptual site model

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

Following the ground investigation, the plausible contaminant sources, receptors and pathways identified in the preliminary geo-environmental risk assessment (Section 5) have been updated or confirmed as follows.

10.2.1 Sources

The ground investigation has confirmed the presence of the following potential sources identified in the initial CSM that require assessment:

- Made Ground containing elevated concentrations of PAH and asbestos containing materials
- Asbestos containing materials associated with gaskets on pipe work of former district heating network
- Ground gases from the decomposition of organic matter within the Made Ground

The following potential source has been removed from the model as no visual or olfactory evidence of petroleum hydrocarbon contamination was identified:

- Petroleum hydrocarbons and VOC/SVOC from fuel leakages within the groundwater below the site

10.2.2 Receptors

The ground investigation has confirmed the presence of the following receptors identified in the initial CSM:

- Site end users (residents)
- Neighbours
- Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability
- Surface water: River Rhondda

- Surface water: Afon Rhondda Fach
- Ecology (mammals and reptiles)

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

10.2.3 Pathways

The ground investigation has confirmed the presence of the following pathways identified in the initial CSM:

- Direct ingestion of soil
- Inhalation of soil derived dust (outdoors)
- Inhalation of soil derived dust (indoors)
- Ingestion of soil attached to fruit/vegetables
- Ingestion of fruit/vegetables
- Dermal contact with dust derived from soil (indoors)
- Dissolved phase leaching from unsaturated soils
- Lateral migration of dissolved phase in groundwater
- Vertical migration of dissolved phase in groundwater
- Groundwater baseflow to surface water
- Surface water run-off
- Surface water drainage discharge
- Vertical migration of ground gases in unsaturated zone and ingress into building
- Lateral and/or vertical migration via preferential pathways (natural/anthropogenic)
- Inhalation of ground gases (indoors)
- Plant root uptake
- Dust deposition on leaves
- Gas migration in root zone
- Secondary poisoning

The following potential pathways have been removed from the model due to the lack of volatile contaminants encountered within the Made Ground and depth to groundwater.

- Inhalation of soil vapours (indoors)
- Inhalation of soil vapours (outdoors)]
- LNAPL lateral migration
- DNAPL vertical migration

10.3 Risk assessment approach

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

Firstly, the risks associated with the identified potential contaminant linkages have been estimated using standardised methods (typically involving comparison of site data with published 'screening values'). Secondly, where screening values are exceeded, the result has been evaluated in an

authoritative review of the findings with other pertinent information to determine whether or not the exceedance is or is not acceptable in the site-specific circumstances.

The data sets used in the assessment comprise the analytical results obtained by Hydrock as listed in Section 6 together with any reliable data from previous investigations as listed in Section 2.

In cases where potentially unacceptable risks are indicated and/or the land is potentially unsuitable for its intended use, actions such as more advanced stages of risk assessment (Tier 3, detailed quantitative risk assessment (DQRA)) or remediation are proposed in Section 13.

10.4 Data Sets

The data set(s) used in this report is based on the conceptual site model and the proposed development and is taken to be the entire area of the site, with the data separated into Made Ground. and natural soils.

GAC based on a soil organic matter (SOM) of 1% has been adopted for all soils based on the laboratory results summarised in Section 7. An SOM of 2.5% was considered appropriate to maintain conservatism for the Made Ground soils as despite the average SOM of 2.52%, the 10th percentile of the 17 SOM results is <1%. An SOM of 1% was considered appropriate for the natural soils as two thirds of the SOM values were <2.5% and the average SOM for the natural soils dataset was <2.5%.

10.5 Human health risk assessment

10.5.1 Generic Assessment Criteria

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

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

GAC are selected based on the following hierarchy:

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

10.5.2 Assessment results

Soil and groundwater data assessment sheets are presented in Appendix F. As an initial screen, all soil samples have been compared to the GAC irrespective of depth. It is recognised that depth is a relevant consideration when evaluating the plausibility of exposure, and this is considered in the evaluation of the outcome of the GAC screening. Based on the data comparison against the GAC the results indicate that the chemicals of potential concern (CoPC) requiring further assessment are: arsenic, benzo(a)pyrene, benzo(b)fluoranthene and dibenz(a,h)anthracene. The PAH CoPC are associated with the road construction (TP101 in the northwestern part of the site) and the 'topsoil' Made Ground within TP_Ph1a_104A (located adjacent to two roads in the northeastern part of the site). The arsenic exceedance was recorded within BH302B, located to the east of the Phase 1a site boundary, with the borehole utilised due to proximity to the site.

10.5.2.1 Asbestos

No visible asbestos containing materials were observed during the investigation. However, a single detection of asbestos was recorded within BH203 at 0.8m depth. The asbestos was recorded to be loose amosite fibres with quantification returning <0.001% w/w (less than laboratory limit of detection).

10.5.3 Risk evaluation

The screening exercise has identified arsenic, benzo(a)pyrene, benzo(b)fluoranthene and dibenz(a,h)anthracene in Made Ground, These are considered further here to assess if the exceedance may be acceptable with respect to the proposed development. The phrase 'further assessment' does not necessarily mean that the soil is 'contaminated' or not fit for use.

Benzo(a)pyrene is present in the Made Ground at a UCL of 2.31mg/kg, which is less than half the GAC of 5mg/kg. The maximum reported concentration is 8.9 mg/kg recorded within TP101 at 0.5m depth which was excavated within the road. The maximum concentration is considered to be part of the inherent variability in the ground, and this minor exceedance is not considered a significant risk to human health and no further consideration is required.

Benzo(b)fluoranthene is present in the Made Ground at a UCL of 3.09mg/kg, which is less than 1.2 time the GAC of 2.6mg/kg. The maximum reported concentration is 11 mg/kg recorded within TP101 at 0.5m depth which was excavated within the road with the only other exceeding concentration recorded within TP_Ph1a_104A at 0.1m depth. The UCL indicates a very slight exceedance and is considered to be associated with traffic and road construction and therefore the maximum concentration is considered to be part of the inherent variability in the ground. The reported concentrations are therefore not considered to represent an unacceptable risk to end users and mitigation measures with regards to Benzo(b)fluoranthene in soil are not required.

Dibenz(a,h)anthracene is present in the Made Ground at a UCL of 0.11mg/kg, which is less than half the GAC of 0.25mg/kg. The maximum reported concentration is 0.45 mg/kg recorded within TP_Ph1a_104a at 0.1m depth which was excavated within the road. The maximum concentration is considered to be part of the inherent variability in the made ground. The reported concentrations are therefore not considered to represent an unacceptable risk to end users and mitigation measures with regards to Benzo(b)fluoranthene in soil are not required.

Arsenic is recorded in the Made Ground at a UCL of 18mg/kg, which is less than half the GAC (37 mg/kg). The maximum concentration of 37mg/kg is considered to be part of the inherent variability in the ground and due to only being a marginal exceedance recorded at 1.1m depth, this minor exceedance is not considered a significant risk to human health and no further consideration is required. Furthermore, the recorded exceedance was within a location out of the Phase 1a area, further reducing the potential risk.

Although loose fibres of asbestos were detected, as the quantification returned less than the laboratory limit of detection (0.001%) and with the depth of the detection at 0.8m, it is considered to pose a low risk to site end users.

Due to the presence of the PAH compounds in exceedance within the road and in very shallow soils adjacent to the corner of two roads (TP104A is the closest of the investigation locations to road that are situated within soft-standing areas) it is concluded that these elevated concentrations are associated with road traffic and the asphalt road surfacing rather than widespread contamination.

10.6 Controlled Waters Risk Assessment

10.6.1 Generic Assessment Criteria

The risks to groundwater and surface water from contaminants on site have been assessed in accordance with the Environment Agency (2006) Remedial Targets Methodology (RTM) Levels 1-2. In doing so the compliance point for the assessment is set as the groundwater directly beneath the site on a precautionary basis.

Site contaminant concentrations are compared with relevant screening values (Water Quality Targets (WQTs), which are linked to the CSM.

Acceptable WQT are defined for protection of human health (based on Drinking Water Standards (DWS)) and for protection of aquatic ecosystems (Environmental Quality Standards (EQS)). In this instance, site concentrations have been compared against EQS on the basis that:

- The site is underlain by the Rhondda Member which is classified as a Secondary A Aquifer.
- The site is within the catchment area for two rivers, the River Rhondda (to the west) and the Avon Rhondda Fach (to the east).
- No groundwater or surface water abstraction points are located within 1km of the site.

The values adopted are detailed in Appendix F and the use of these values in this assessment is considered as a first screening for potential risks of pollution of Controlled Waters. More detailed assessment may be required, with this identified in Section 13.

There are no UK EQS WQT for petroleum hydrocarbon fractions in water. Provisional predicted no-effect concentrations (PNEC) protective of aquatic toxicity can be calculated using the European Chemicals Agency's (ECHA) methodology and Concawe's report on the environmental classification of petroleum substances. Such as assessment suggests that 10µg/l is a reasonable ecological-based WTV. UK EQS for TPH indicator compounds for benzene, toluene, xylenes and naphthalene take precedence in any assessment.

10.6.2 Assessment results

Soil leachate data assessment sheets are presented in Appendix F. Based on the data comparison against the WTV the results indicate that the chemicals of potential concern (CoPC) require further assessment are ammoniacal nitrogen, chloride, sulfate, copper, iron, lead, zinc and fluoranthene. Theoretical exceedances of the WTV were also recorded for benzo(a)pyrene, benzo(g,h,i)perylene, silver, mercury, chromium (III) and chromium (VI) as the laboratory limit of detection is above the relevant WTV.

No spatial conclusions are possible from the leachate data, as the tested samples were targeted to locations where infiltration testing was completed.

10.6.3 Risk evaluation

The data indicate that the EQS for metals (copper, iron, lead and zinc), ammoniacal nitrogen, chloride, sulfate and the PAH species fluoranthene in soil leachate are exceeded. This suggests that there is a risk to the groundwater body beneath the site as it is possible for contaminants to leach from the Made Ground. Whilst the leachate testing indicates a theoretical possibility for the CoPC to leach, this is considered to be a conservative assessment, due to the high level of agitation involved in leachate testing in comparison to in-situ conditions on site.

The groundwater gradient is to the south and is anticipated to follow surface contours. The groundwater in the Rhondda Member provides base flow to the ponds located 850m to the east.

It is noted that the groundwater beneath the site is recorded to be of poor quality (by NRW) due to high chemical levels. This was further confirmed by Hydrock groundwater sampling of BH307 in the extreme south of the wider site (as discussed in Section 2.4.2) The elevated concentrations of heavy metals and sulfates are considered to be a product of the intensive mining history in the Rhondda Valley region.

Whilst there are concentrations of Chemicals of Potential Concern elevated above the water quality criteria, based on the investigation works undertaken to date and subject to agreement with the Environment Agency, it is not considered that the site poses a significant risk to Controlled Water.

10.7 Ground gas risk assessment

The potential risk from ground gas has been assessed in accordance BS 8485:2015+A1:2019 and has been based on the relevant data identified and summarised in Section 7, namely ground gas spot monitoring completed in two phases, one in summer 2024 and the other in March 2025.

10.7.1 Assessment Criteria

Gas monitoring was undertaken at the site on the basis of the desk study and previous investigations where Made Ground was recorded to be up to 3.0m thick. The BS 8485:2015+A1:2019 methodology has therefore been adopted with the calculation of hazardous gas flows (Q_{hg}) followed by the derivation of a Gas Screening Value for the site/borehole location with comparison to the limiting values within Table 2-CS by site characteristic' utilised.

10.7.2 Data adequacy

As per BS8576:2013 Decision Matrix for Initial Monitoring, it is judged from the available evidence that the gas generation potential at the site is low (due to thicknesses of Made Ground) and as per Tables 5.5a and 5.5b CIRIA C665, the sensitivity of the development is high (due to the proposed development comprising low-rise housing with gardens). Consequently, and in accordance with CIRIA C665 (Table 5.5a and 5.5b) and Figure 6 BS8576:2013, an appropriate minimum monitoring regime is 9 readings over six months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2015 +A1:2019 and CL:AIRE TB17 advocate that monitoring

Hydrock has undertaken the nine readings over one year as set out above, including during periods of falling and low atmospheric pressure. As such, the conclusions presented below are considered to approximate to worst-case conditions.

Due to flooding of the response zone, data from BH_Ph1a_201 has been discounted from further assessment.

10.7.3 Assessment results

The risks associated with the ground gases methane (CH4) and carbon dioxide (CO2) have been assessed using BS 8485:2015 +A1:2019 with the risk assessment presented in Appendix E.

The assessment guidelines set out in Table 2 of BS 8485 are based on interpretation of the gas concentrations and the gas flow rates. The quantitative assessment has been carried out by comparing the individual gas concentrations and borehole hazardous gas flow rate values (Qhg) in Appendix E with the published CS thresholds (BS 8485 Table 2), in addition to a worst-case GSV assessment in accordance with section 6.3.7 of BS 8485. The assessment is summarised and presented in full in Appendix E

The appended data assessment includes a ternary plot assessment of the data (assessment of ground gas ratios (O2 + N2, CO2 and CH4)), undertaken in general accordance with guidance by Wilson et. al. (2018).

10.7.4 Risk evaluation

The calculated borehole hazardous gas flow rates for carbon dioxide and methane indicates CS1 conditions and methane and carbon dioxide at concentrations are 'typically' below 1% and 5% respectively. As such, the site is classified as Characteristic Situation 1.

Based on the data no mitigation measures are required.

10.8 Phytotoxicity risk assessment

Soil contaminants, if present at sufficient concentrations, can have an adverse effect on plant health. Phytotoxic effects can be manifested by a variety of responses, such as growth inhibition, interference with plant processes, contaminant-induced nutrient deficiencies and chlorosis (yellowing of leaves). Phytotoxicity is a difficult parameter to quantify given that experimental techniques vary widely and variations exist in plant tolerances, soil effects and synergistic/antagonistic reactions between chemicals. Guidelines for phytotoxicity and general plant health have been published for a limited number of substances for topsoil (BS BS3882:2015) , for soils used for grazing/landscaping (ICRCL 70/90), and for agricultural uses (MAFF Code of Good Agricultural Practice). Some of these guidelines focus on reduced yield for agricultural crops, and in general do not define concentrations in soil at which plant health is necessarily significantly compromised. The guidelines are not based on plant uptake and human consumption considerations, this is considered as an exposure route in the derivation of human health GAC.

Reported soil sample results have been screened against these guidelines (where available) and the results are provided in the screening tables in Appendix F.

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

Notwithstanding the concentrations of contamination identified, there is no subsoil or topsoil growing medium on the site and this will require import to support the planned provision of landscaped areas and/or residential gardens as Made Ground soils are not suitable as a growing medium.

10.9 Construction materials risk assessment

10.9.1 Water Pipelines

A formal water pipe investigation and risk assessment is beyond the scope of this report. However, the findings of this investigation have been compared to the threshold values in Water UK HBF (2014), Table 1 as far as is practicable.

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

Because the requirements from individual water companies can vary, confirmation of pipeline requirements should be sought from the relevant water supply company at the earliest opportunity.

10.9.2 Other construction materials

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

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

The implications for buried concrete are discussed in Section 9.

10.9.3 Contamination risk to construction workers

Whilst risks to construction workers are not discussed in detail, the following section discusses potential risks that should be considered in the preparation of Risk Assessments, Method Statements, Plans of Work, or equivalent.

Information presented is provided to assist in managing the risk associated with contamination in soil and groundwater at the site but is not definitive. Contractors are responsible for undertaking their own assessments and assessing what risks are present and what control measures are required.

Task specific risk assessments and method statements should be in place, and risks and required mitigation measures communicated to all relevant personnel prior to the works commencing. Appropriate PPE and, if required, RPE should be provided and utilised.

10.9.4 Asbestos

Whilst no clearly identifiable ACM has been seen during the site walkover or during the ground investigation within the Phase 1a site boundary, the laboratory testing has identified low concentrations of asbestos fibres (<0.001%) in the soils. It is also noted that fly-tipped possible asbestos containing materials were observed in open scrubland areas to the east of the Phase 1a site and asbestos was identified within the district heating network pipes.

All site staff should be made aware of the possibility of encountering unidentified fragments of asbestos within the Made Ground soils anywhere on the site at any stage of the development. It is advised that the Contractor should consider supplying suitable and sufficient 'Asbestos Awareness' training (specific to asbestos in soils) to all site staff who could foreseeably encounter asbestos containing materials during the course of their work.

The Contractor for each stage of works must undertake a suitable and sufficient Risk Assessment in accordance the Regulation 6 of the Control of Asbestos Regulations 2012 (CAR2012). The results of the assessment should be used to compile a Plan of Work in accordance with Regulation 7 of CAR2012, which limits the potential exposure and spread of asbestos fibre. Appropriate training should be provided to all site staff identified within the risk assessment as having the potential to be exposed or encounter asbestos during their work in accordance with Regulation 10 of CAR2012.

It is the responsibility of the Contractor to ensure that mitigation measures are suitable and sufficient to prevent exposure to airborne asbestos so far as is reasonably practicable in accordance with Regulation 11 of CAR2012. However, the asbestos fibres detected at the site are within a soil matrix, if the soils are kept damp and appropriate site hygiene measures are in place, this should assist in minimising the risk of the release of airborne fibres.

10.10 Updated Conceptual Site Model

The potential sources, pathways and receptors identified in the desk study (Section 5) have been investigated and assessed. The Source-Pathway-Receptor linkage assessment originally developed as the desk study stage has been updated on the basis of the investigation information and generic risk assessment and is presented in Table 10.1 below.

The final CSM is illustrated on Hydrock Drawing 30603-HYD-XX-XX-DR-GE-1024 in Appendix A.

A summary of the Source-Pathway-Receptor (S-P-R) contaminant linkages for which the risks may be unacceptable and require mitigation (those that are moderate or higher) are identified in Table 10.1.

Table 10.1 assumes the S-P-R linkages which have been discounted (subject to agreement) at the risk evaluation stage are confirmed by the regulators and the warranty provider as not requiring further consideration (mitigation). If these assumptions are not agreed during regulatory discussions, the conclusions will need to be updated.

The S-P-R linkages that warrant further assessment and/or mitigation are:

Table 10.1: Updated plausible contaminant linkages

Source	Pathway	Receptor
Made Ground containing elevated concentrations of PAH and asbestos containing materials	Direct ingestion of soil Dermal contact with soil Inhalation of soil derived dust (indoors and outdoors) Dissolved phase leaching from unsaturated soils Lateral migration of dissolved phase in groundwater Vertical migration of dissolved phase in groundwater Groundwater baseflow to surface water Surface water run-off Surface water drainage discharge	Site end users (residents) Neighbours Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability Surface water: River Rhondda and Afon Rhondda Fach
Asbestos within existing buildings/ structures	Inhalation of asbestos fibres (indoors and outdoors)	Site end users (residents) Neighbours
Asbestos containing materials associated with gaskets on pipe work of former district heating network	Inhalation of asbestos fibres (outdoors)	Neighbours

10.11 Mitigation measures

The outline mitigation measures presented below are provided for guidance only, and do not represent a 'Remediation Options Appraisal', or a 'Remediation Strategy', prepared in accordance with LCRM (2023).

Subject to regulatory (and NHBC) agreement, Hydrock considers the following mitigation is potentially required to demonstrate that the site is suitable for use for the proposed end use (subject to final development design). The mitigation measures include:

- The installation of a minimum 600mm engineered cover system in gardens and 450mm in public open space, comprising a bonded geogrid break layer (e.g. TX160G) comprising, subsoil beneath a topsoil thickness of between 150mm and 300mm (PL1 and PL6), or
- Removal of all Made Ground and placement of 150mm of topsoil (utilising natural weathered gravels as a subsoil).

The methodology for the remediation should be set out in a Remediation Strategy (which will include the 'Implementation Plan', the 'Verification Plan' and the 'Long Term Monitoring and Maintenance Plan'), which will need to be submitted to the warranty provider and the regulatory authorities for approval.

In addition, the production of a Materials Management Plan and its approval by a Qualified Person will be required to allow reuse of suitable material at the site in accordance with waste regulations.

Verification reports by a competent independent geo-environmental specialist will be required following completion of any remedial works.

11. Waste and materials management

11.1 Introduction

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

Section 11.2 below describes the key issues relating to off-site disposal to landfill and Section 11.3 considers requirements relating to reuse of soils and materials management.

11.2 Waste disposal

11.2.1 Principles

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

Classification is a staged process:

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

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

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

11.2.2 HazWasteOnline™ assessment

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

11.2.3 Preliminary waste disposal options

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

- The 'topsoil' Made Ground generally has a low organic content (as proven by the Fraction of Organic Carbon tests) and is likely to be classified as non-hazardous waste.
- The natural uncontaminated subsoils are likely to be classified as non-hazardous waste.
- The 'General' Made Ground is likely to be classified as non-hazardous waste.
  - A single sample from TP207A was classified as hazardous due to elevated pH, this is considered to be representative of abundant concrete within the Made Ground and due to the methodology of testing (which involves crushing of the sample) rather than a true reflection of the soil waste classification.
- Where visible asbestos containing materials are present this will be classified as hazardous
- Where asbestos fibres are present at greater than the 0.01% this material will also be classified as hazardous

11.2.4 General waste comments

It should be noted that the preliminary waste assessment presented above is subject to the following:

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

generally be subject to the Lower Rate Landfill Tax. The landfill tax value changes each April and can be found at https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013.

- Before a waste producer can move waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following :
  - Duty of care transfer note / Hazardous Waste consignment note, including comment as to if pre-treatment has been undertaken; and
- Basic Characterisation of the waste, to include description of the waste; waste code (using list of wastes); composition of the waste (by testing, if necessary) and; WAC testing (if required).

11.3 Materials management

11.3.1 Introduction

Soils that are to remain on site, should be managed and reused in accordance with a Materials Management Plan (MMP), prepared in accordance with 'The Definition of Waste: Development Industry Code of Practice', Version 2 (CL:AIRE), known as the DoWCoP. Where all aspects of the DoWCoP are followed the soils are considered not to be waste, because they were never discarded in the first place. It should be noted that Version 3 of the DoWCoP is undergoing preliminary consultation, and recommendations within this report with regard to waste and re-use of soils will require review when the DoWCoP Version 3 is adopted.

Version 2 of the DoWCoP clearly sets out the principles and an outline of the requirements of a MMP. The following compliance criteria must be seen to apply to the MMP for the site:

- Factor 1: Protection of human health and protection of the environment.
- Factor 2: Suitability for use, without further treatment.
- Factor 3: Certainty of Use.
- Factor 4: Fixed Quantity of Material.

The reuse of soils at sites should be considered during the planning and development design process so that compliance with issues such as fixed quantity and certainty of use clearly relate to agreed site levels. Suitability of Use is normally evident from the remediation strategy or the design statement, which form an integral part of a MMP. However, some soils may need to be tested post-excavation to prove they are suitable for use.

As the site forms part of the wider Penrhys Village Development site, it is considered likely that the materials re-use strategy will be considered for the wider site as a whole rather than individual phases. The management of materials across the wider Penrhys Village site is discussed in the Hydrock Materials Management Overview report (ref. 30603-HYD-XX-XX-RP-GE-1005).

Once the MMP is finalised, it must be declared by a Qualified Person (QP). The Declaration is an on-line submission as part of which the QP is required to confirm that the declaration is being made before the relevant works have commenced (i.e. it is not a retrospective application).

Once all material movements have been completed in accordance with the MMP a verification report must be produced, kept for 2 years and provided to the EA on request.

It should be noted that failure to comply with the requirements of the DoWCoP when re-using materials has potentially significant consequences for the waste holder. The risk is that the reused materials are still regarded as a waste that has been illegally deposited. From 1 April 2018, the scope of Landfill Tax has been extended to sites operating without the appropriate environmental disposal permit, and

operators of illegal waste sites will now be liable for Landfill Tax. Further information is available at: https://www.gov.uk/government/publications/landfill-tax-disposals-not-made-at-landfill-sites/landfill-tax-disposals-not-made-at-landfill-sites.

If soils are excavated and reused on sites (or moved to another site) without a MMP, exemption, or appropriate Permit in place, anyone who knowingly facilitates the disposal may be 'jointly and severally liable' to any assessment of tax, fines or prosecution.

11.3.2 Materials management scenarios

The materials management scenarios present on site are discussed below.

It should be noted that more than one scenario may apply, dependent upon where the soils are proposed for reuse.

11.3.2.1 Clean, naturally occurring materials – reused on the site of origin.

Where soils are naturally occurring, uncontaminated and are reused on the site they are excavated (i.e. greenfield site with documented site history, with no Made Ground), they will fall outside the Waste Framework Directive (WFD) by means of Article 2 1(c) (i.e. they will not be a waste when reused on the site of origin).

However, there needs to be certainty of that reuse, and evidence is necessary to support this strategy, for example through information provided during the planning process. The onus is on the developer to demonstrate that the materials are not a waste and will never become a waste. As such, a Materials Re-use Strategy is recommended to show certainty. Alternatively, if the volume of material is under 1,000 tonnes, then a U1 waste exemption may be applied for from the Environment Agency if the use meets the strict re-use requirements of that exemption.

It may be noted that some 'clean naturally occurring materials' may still fail the 'suitable for use' test, for example, soils with a naturally high organic content may not be suitable for use because of their propensity to produce ground gases such as methane. Rules regarding other more unusual circumstances such as where natural soils contain an unacceptably high mineral content are described in the DoWCoP.

11.3.2.2 Clean, naturally occurring materials – transferred to other sites.

Where soils are naturally occurring, uncontaminated and are transferred to other sites (i.e. direct transfer), they will not become waste as long as the transfer is undertaken in accordance with the DoWCoP. A MMP must be prepared for the receiving site and the materials movement must be noted in the MMP of the Donor site. This movement must have been declared to CL:AIRE prior to the works commencing.

11.3.2.3 Made Ground and other contaminated soils

On sites where Made Ground or contaminated soils are present, any soils excavated will be a waste as soon as they are excavated (even if they are clean, naturally occurring materials), unless they are subject to reuse in accordance with the DoWCoP. As such, for any brownfield site or a site where Made Ground is present and soils are being moved and reused, the materials could be deemed a waste, subject to either:

- a Materials Management Plan (MMP), to prevent the material being classified as a waste following reuse; or
- an exemption (for limited volumes); or
- an environmental permit, dependant on its status.

Made Ground cannot be moved between sites under DoWCoP alone and would require relevant permits as part of the MMP documentation for the Hub site the material is being treated at.

11.3.2.4 Recycled materials

All recycled materials (6F2 etc.) must be produced under the 2013 WRAP 'Quality Protocol: Aggregates from inert waste', whether on site or off-site. If they are not, they will be deemed a waste and can only be used on site under a permit. More information can be found at https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-frm-inert-waste.

11.3.2.5 Geotechnical improvement requirements

Construction activities carried out on uncontaminated soils solely for the purpose of improving geotechnical properties e.g. lime / cement modification, are not generally regarded as waste treatment operations and do not require a permit.

However, should processing be needed (such as screening, treatment or improvement), that would constitute a waste activity and require a mobile treatment permit. This may be as simple as removing oversize material with an excavator bucket, to using a riddle bucket to remove hardcore to full mechanical screening.

12. Uncertainties and limitations

12.1 Site-specific comments

Currently proposed development plans are yet to be finalised with numerous potential retaining wall designs proposed.

Infiltration testing was proposed to be completed in the regions of the site where attenuation basins are proposed, however due to the highly unstable nature of the Made Ground, particularly adjacent to the western site boundary, this was not possible. Therefore, infiltration rates of the bedrock in the proposed attenuation basin areas may be different to those recorded during this investigation. Furthermore, due to time constraints, full BRE 365 infiltration testing was not possible and any SuDS design should take this into consideration.

12.2 General comments

Hydrock Consultants Limited (Hydrock) has prepared this report in accordance with the instructions of client. (the Client), by e-mail dated 25 February 2025 under the terms of appointment for Hydrock, for the sole and specific use of the Client and parties commissioned by them to undertake work where reliance is placed on this report. Any third parties who use the information contained herein do so at their own risk. Hydrock shall not be responsible for any use of the report or its contents for any purpose other than that for which it was prepared or for use of the report by any parties not defined in Hydrock's appointment.

This report details the findings of work carried out in February 2025. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed.

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

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

Plans that provide assessment of foundation types and depths are indicative and subject to further design. This design should incorporate a detailed assessment of the influence of trees, influence of cut to fill proposals and geological conditions.

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

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

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

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

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

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

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

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

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

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

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

13. Recommendations for further work

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

- demolition / refurbishment asbestos survey;
- discussion with specialists with regard to invasive species present on site (cotoneaster stand) and other potential ecological receptors (e.g. reptiles);
- discussion and agreement with utility providers regarding the materials suitable for pipework;
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report;
- provision of geotechnical design for the Category 2 (retaining walls.);
- production of a Remediation Strategy and Verification Plan (and agreement with the regulatory bodies and the warranty provider);
- production of a Materials Management Plan relating to reuse of soils at the site and import of soils to the site;
- remediation and mitigation works; and
- verification of the earthworks, remediation and mitigation works.
- Upon completion of monitoring regimes, site investigation boreholes should be decommissioned in line with relevant guidance where deemed appropriate by a qualified professional (for example the Environment Agency's Good Practice for Decommissioning Redundant Boreholes and Wells, 2012 or section 2.4.3.2 of NHBC NF94, 2023).

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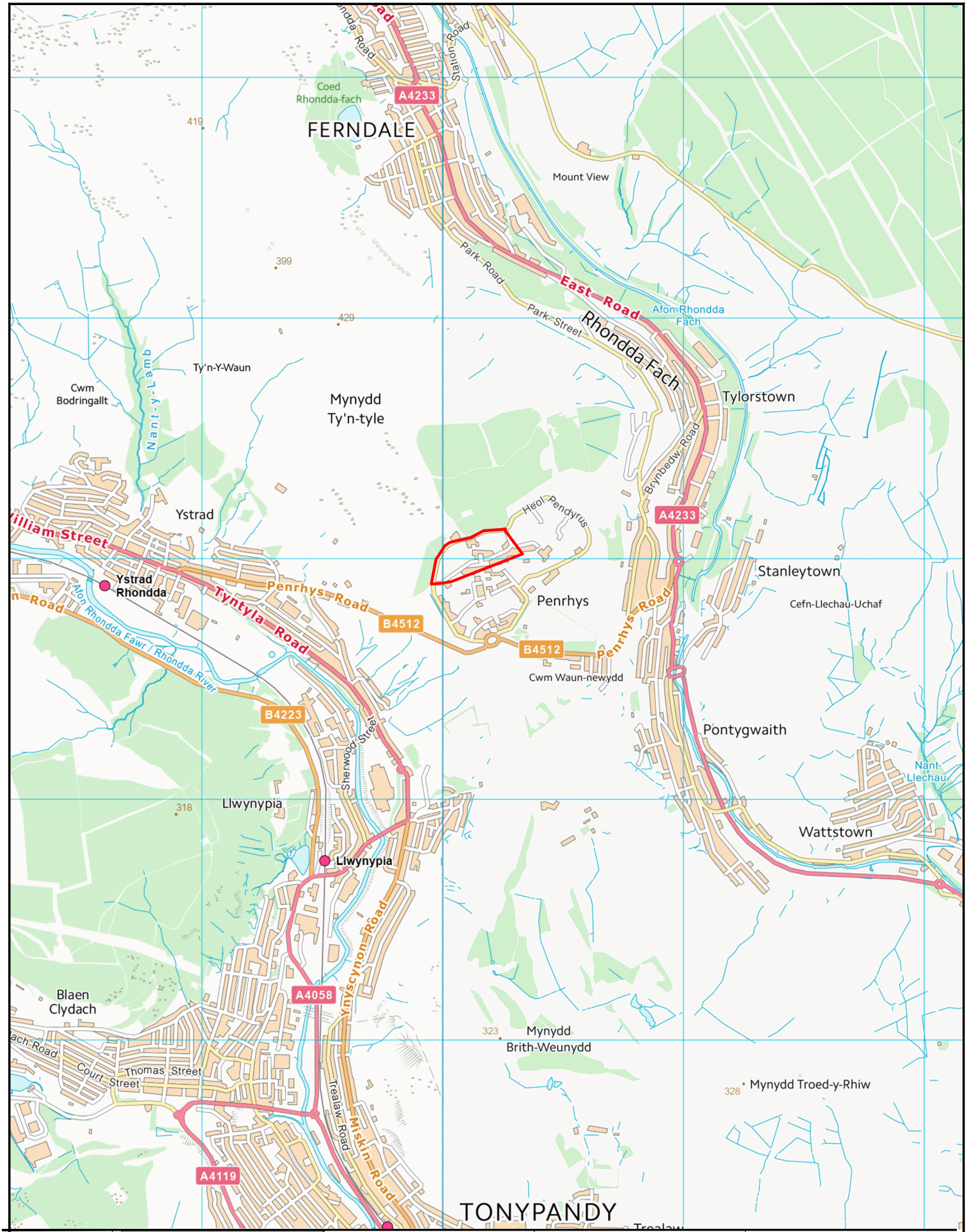
Appendix A Drawings



OS NORTH

Site Ref: ST09

0 500 Metres

REV.						
P2	Updated for Phase 1a					
	EF	31/03/25	KG	31/03/25	AE	31/03/25
P1	FIRST ISSUE					
	EP	12/07/24	EW	12/07/24	AE	17/07/24
	REVISION NOTES/COMMENTS					
	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT
TRIVALLIS

PROJECT
PENRHYS VILLAGE, RHONDDA CYNON TAFF

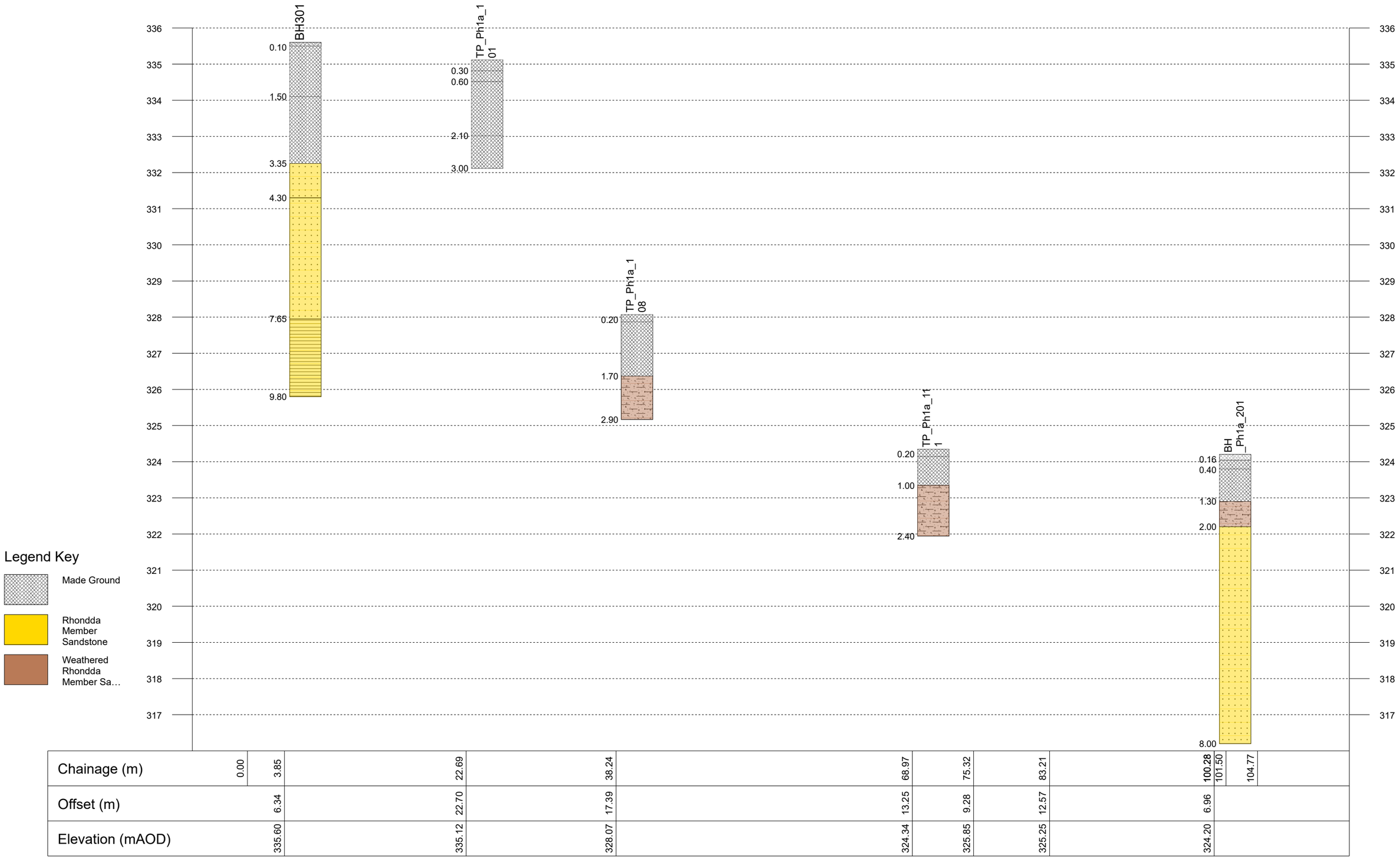
TITLE
SITE LOCATION PLAN
PHASE 1A

HYDROCK PROJECT NO.	SCALE @ A4
C-30603	1:20,000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO.	REVISION
30603-HYD-XX-XX-DR-GE-1004	P2

Project ID:	30603	Title:	Section Line
Project Title:	Penrhys Phase 1a	Document Reference:	Figure X
Location:	South Wales	Horizontal Scale:	1:375
Client:	Trivallis	Vertical Scale:	1:100



Project ID:	30603	Title:	Section Line 2
Project Title:	Penrhys Phase 1a	Document Reference:	Figure A.2
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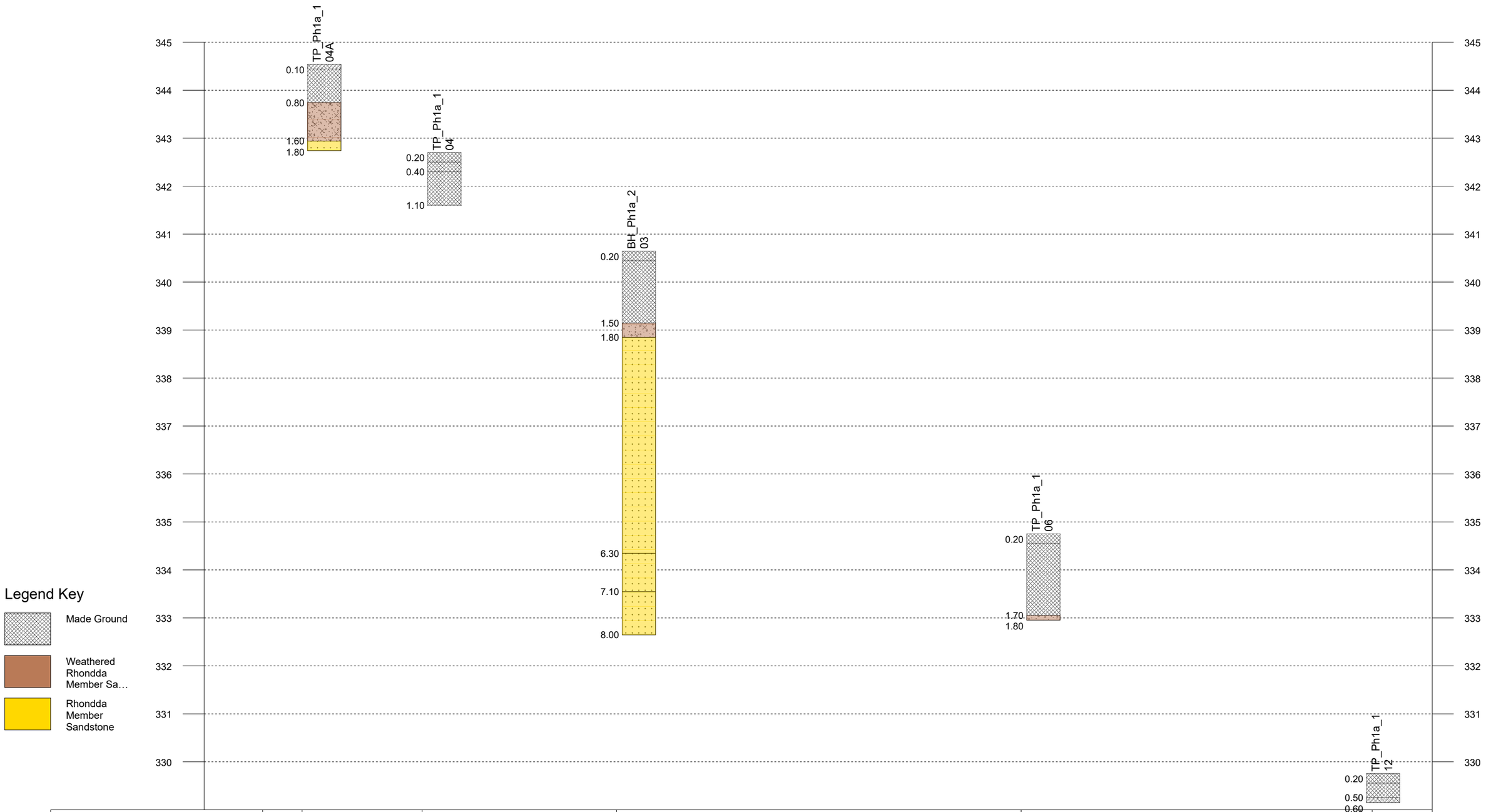
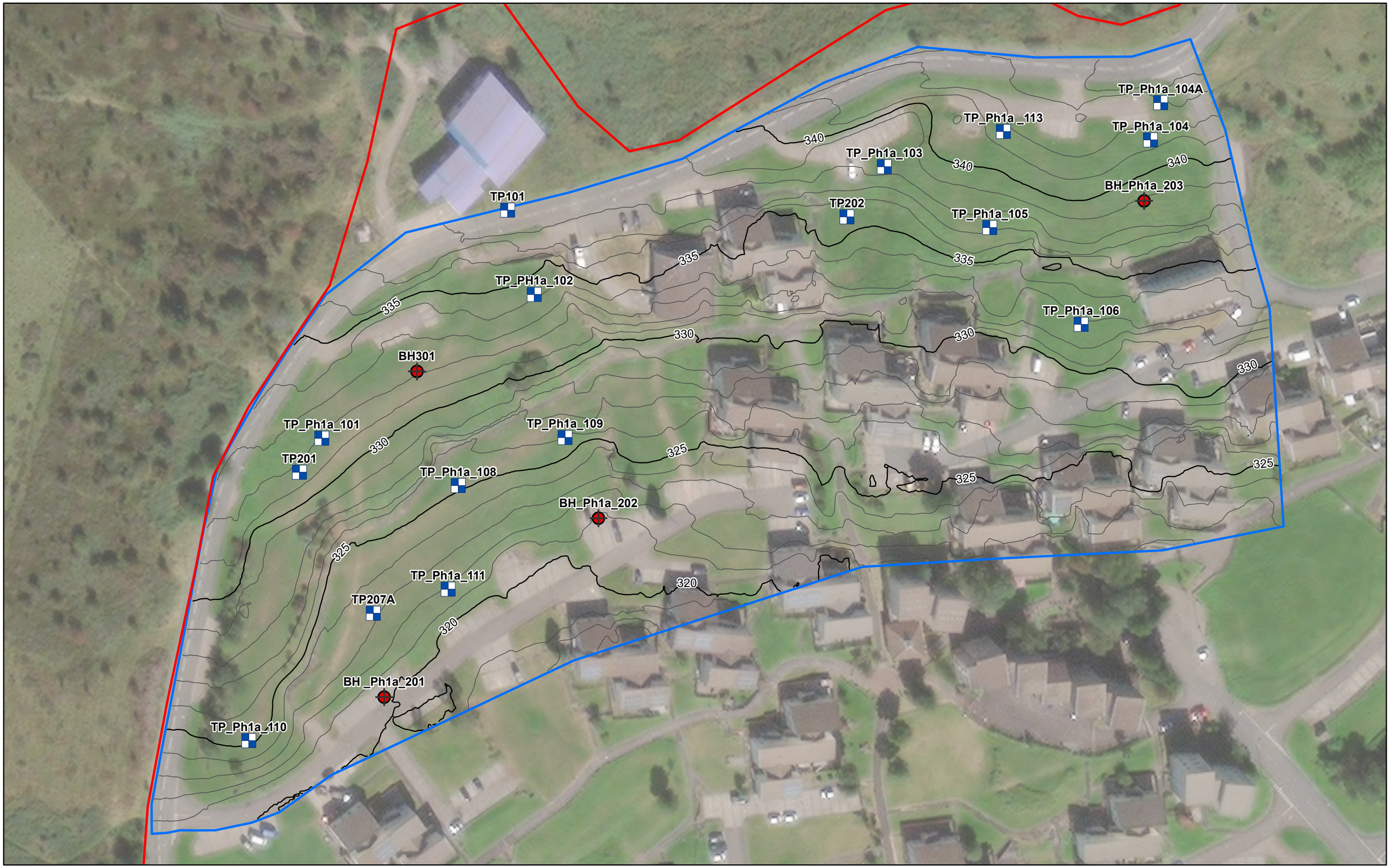
Client:	Trivallis	Vertical Scale:	1:80





Depth to Competent Bedrock (mOD) Phase1A

Project: 30603 - Penrhys

Figure Ref: 30603-HYD-XX-XX-DR-GE-1022

Client: TRIVALLIS

Date Created: 11/03/2025

Hydrock now Stantec

Notes:
The interpolation used to achieve these contours is kriging. This assumes that the distance or direction between sample points reflects a spatial correlation that can be used to explain variation in the surface.

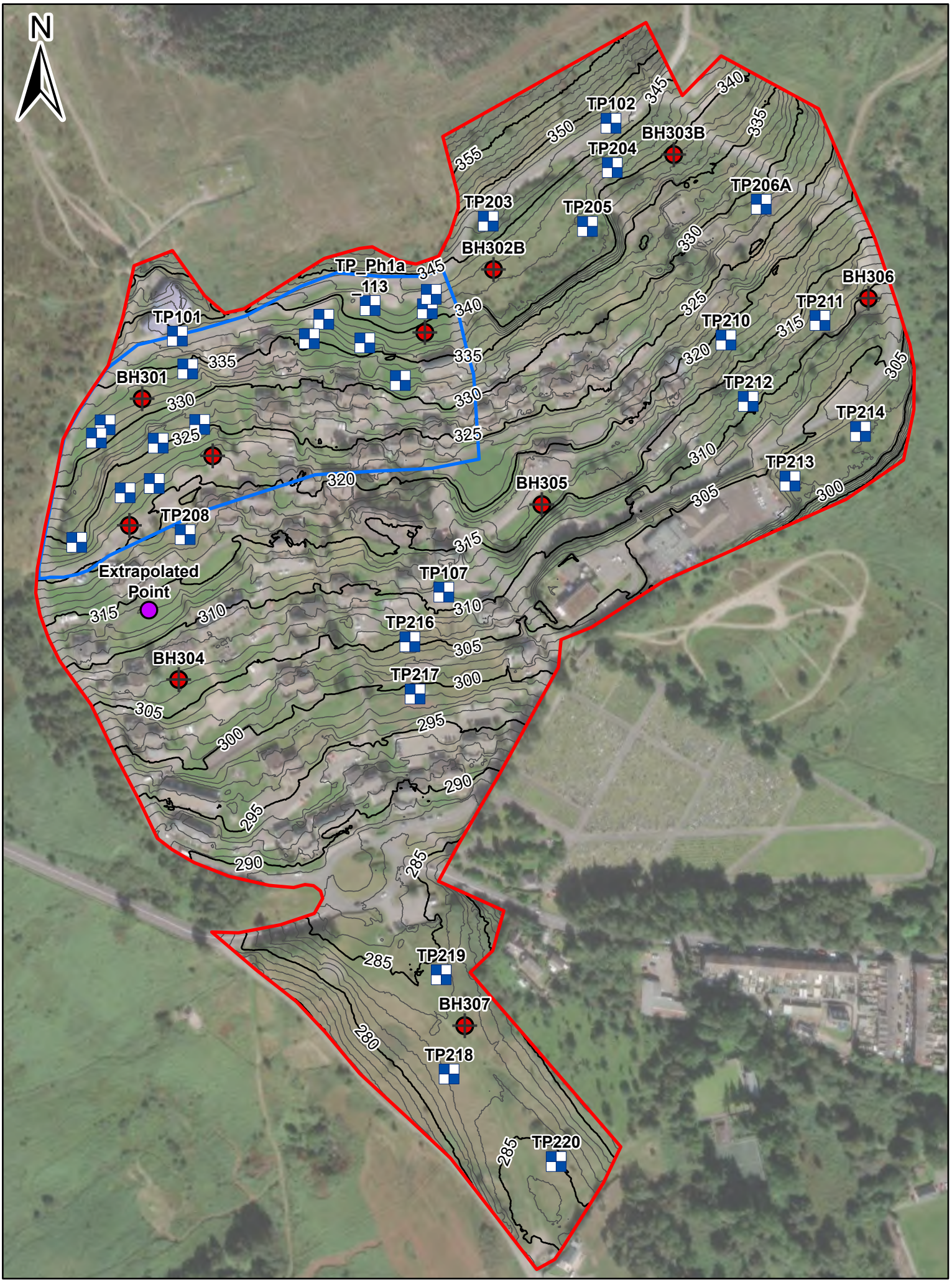
Scale: 1:1,000 at A3

Metres
10 0 10 20 30 40 50 60 70 80 90

Yards
10 0 10 20 30 40 50 60 70 80 90

LEGEND

- Bore hole
- Trialpit
- Boundary
- Phase 1A Boundary



Depth to Competent Bedrock

Project Number: 30603

30603-HYD-XX-XX-DR-GE-1023

Notes: The interpolation used to achieve these contours is splining. This assumes that the distance or direction between sample points reflects a spatial correlation that can be used to explain variation in the surface. Extrapolated points are taken from bedrock data recorded within the boreholes and added to plot to aid the interpolation.

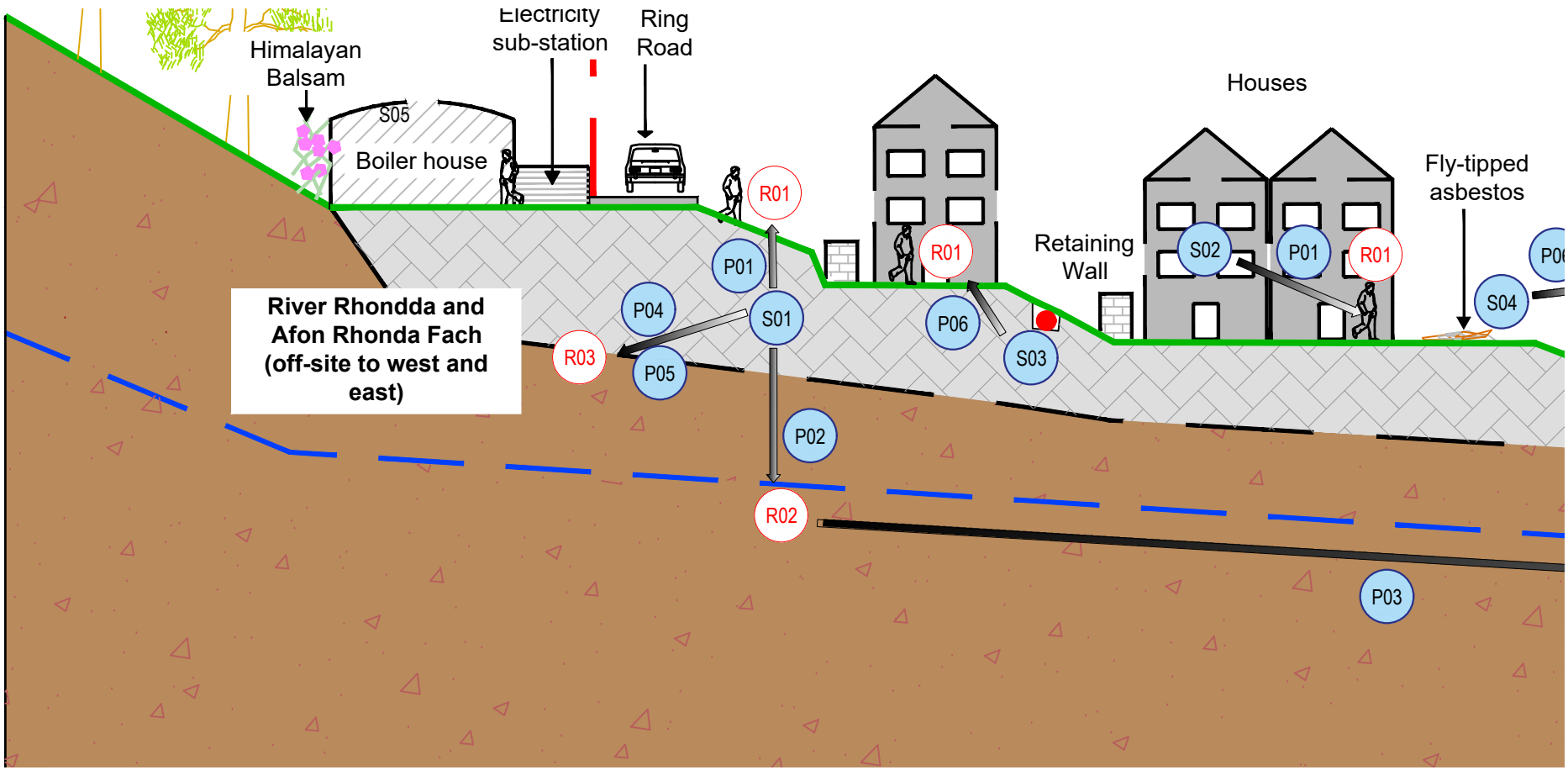
Scale: 1:3,600 at A4

50 0 50 100 Metres

Borehole
Trial Pit
Extrapolated Point
Boundary
Phase 1A Boundary

Hydrock — Stantec

16/01/25


Himalayan Balsam
S05
Boiler house
Electricity sub-station
Ring Road
Houses
Retaining Wall
Fly-tipped asbestos
River Rhondda and Afon Rhonda Fach (off-site to west and east)
R01
R01
R01
R02
R03
P01
P01
P02
P03
P04
P05
P06
S01
S02
S03
S04

Affordable/Market

Name	Affordable/Market	Dwelling Count
2B4P Wide Detached	Affordable	6
3B4P Semi-detached	Affordable	24
3B5P Narrow Terraced	Affordable	4
3B5P Wide Detached	Affordable	14
4B6P Semi-detached	Affordable	16
4B7P Detached	Affordable	1
		65

3B4P Semi-detached	Market	8
3B4P Semi-detached (Integ Garage)	Market	8
3B5P Wide Detached	Market	3
4B7P Detached	Market	5
		24
Grand total		89

On/Off Plot Parking

Name	On Plot Parking	Dwelling Count
2B4P Wide Detached	No	6
3B4P Semi-detached	No	22
3B5P Narrow Terraced	No	4
3B5P Wide Detached	No	15
4B6P Semi-detached	No	10
		57

3B4P Semi-detached	Yes	10
3B4P Semi-detached (Integ Garage)	Yes	8
3B5P Wide Detached	Yes	2
4B6P Semi-detached	Yes	6
4B7P Detached	Yes	6
		32
Grand total		89

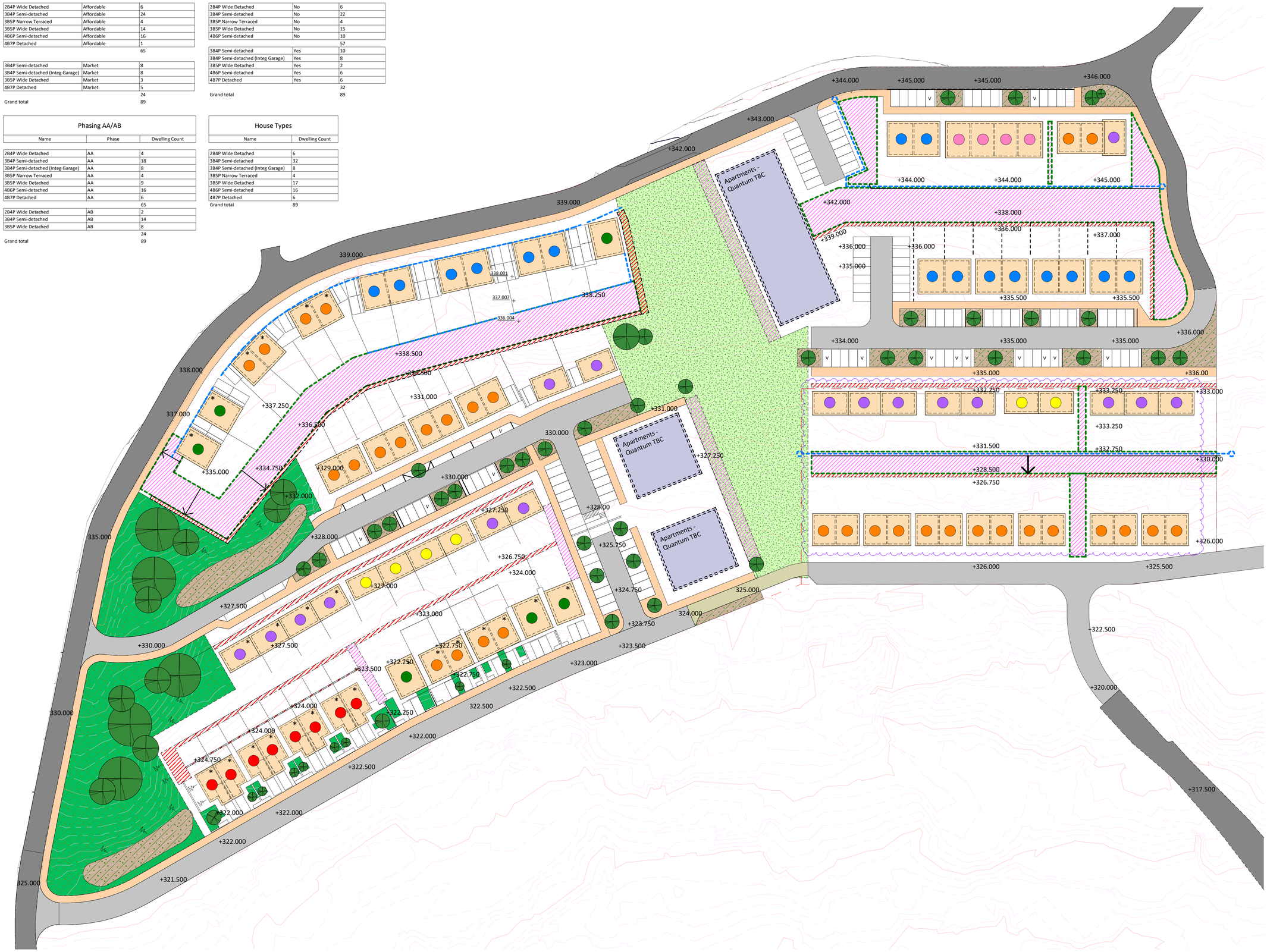
Phasing AA/AB

Name	Phase	Dwelling Count
2B4P Wide Detached	AA	4
3B4P Semi-detached	AA	18
3B4P Semi-detached (Integ Garage)	AA	8
3B5P Narrow Terraced	AA	4
3B5P Wide Detached	AA	9
4B6P Semi-detached	AA	16
4B7P Detached	AA	6
		65

2B4P Wide Detached	AB	2
3B4P Semi-detached	AB	14
3B5P Wide Detached	AB	8
		24
Grand total		89

House Types

Name	Dwelling Count
2B4P Wide Detached	6
3B4P Semi-detached	32
3B4P Semi-detached (Integ Garage)	8
3B5P Narrow Terraced	4
3B5P Wide Detached	17
4B6P Semi-detached	16
4B7P Detached	6
Grand total	89



- 2B4P Wide Detached
- 3B4P Semi-detached
- 3B4P Integrated Garage
- 3B5P Narrow Terraced
- 3B5P Wide Detached
- 4B6P Semi-detached
- 4B7P Detached
- Phase 1A - AB
- * Market Housing (Savills Recommendation)

WIP

DRAFT

Current layout is indicative only and a working drawing. We are awaiting further information from geotechnical engineers, civil engineers, landscape architects, master planning and highways.
Layout is subject to revisions following the receipt of outstanding information and coordination with the design team.

STATUS	REV	DATE	DESCRIPTION
S0	P06	19.03.2025	Draft WIP Schedules
S0	P06	07.03.2025	Draft Issue
S0	P05	20.02.2025	Draft WIP Issue
S0	P04	19.02.2025	Latest WIP draft issue
S0	P03	29.01.2025	First Issue
S0	P02	15.01.2025	Existing layout overlay added
S0	P01	23.12.2024	First Issue

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DRAWING TITLE
Phase 1A - Proposed WIP Site Plan Key

STATUS CODE
S0 - WORK IN PROGRESS

SCALE
1 : 500
@A1

PROJECT - ORIGINATOR - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER
156757-STL-XX-XX-DR-A-09003

STATUS_REVISION
S0_P06

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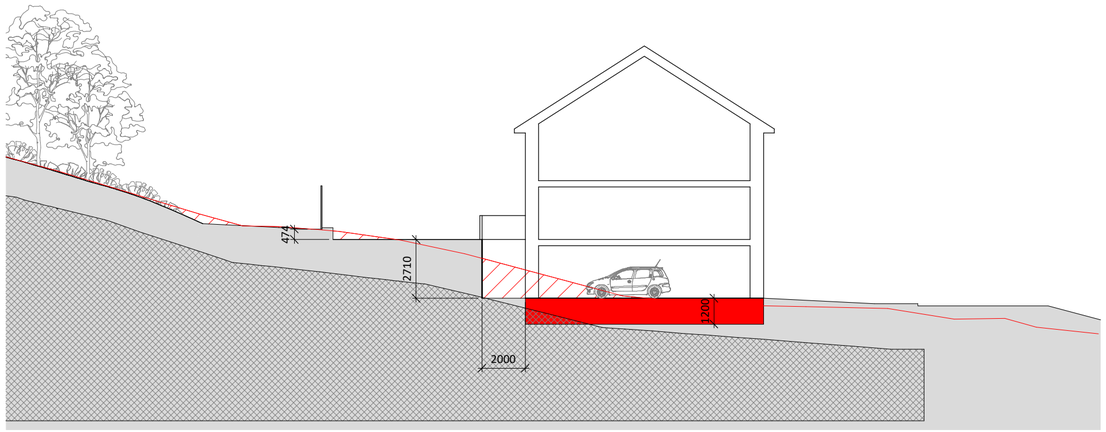

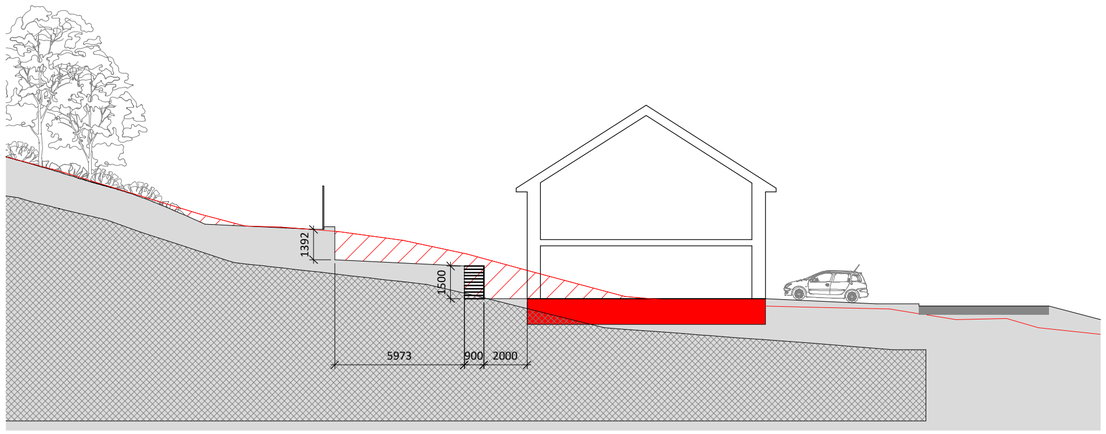

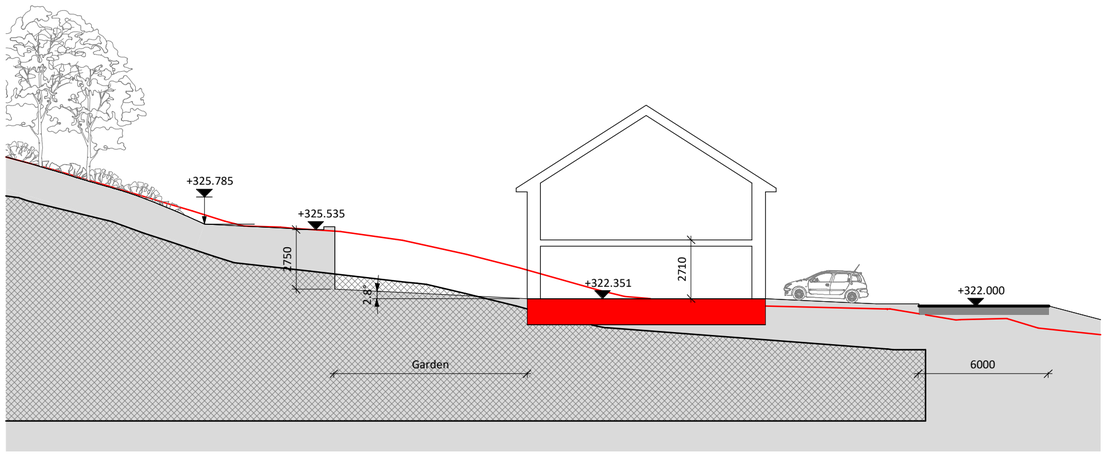

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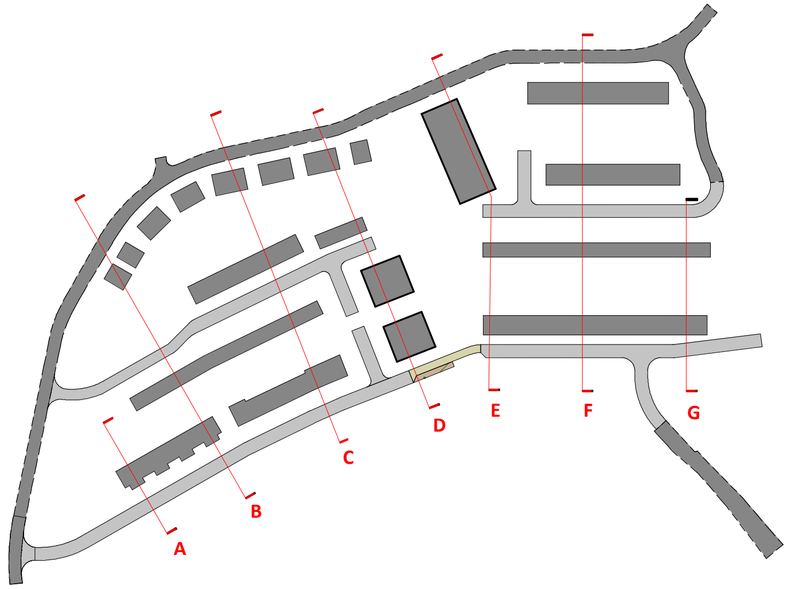

Existing Topography

Proposed Topography

Foundation

Fill

Rock Head

Proposed

WIP
DRAFT

STATUS	REV	DATE	DESCRIPTION
S0	P06	07.03.2025	Draft Issue

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DRAWING TITLE
Phase 1A - Proposed Site Section A Options

SUITABILITY STATUS
S0 - WORK IN PROGRESS

SCALE
As indicated
@A3

PROJECT - ORIGIN. - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER
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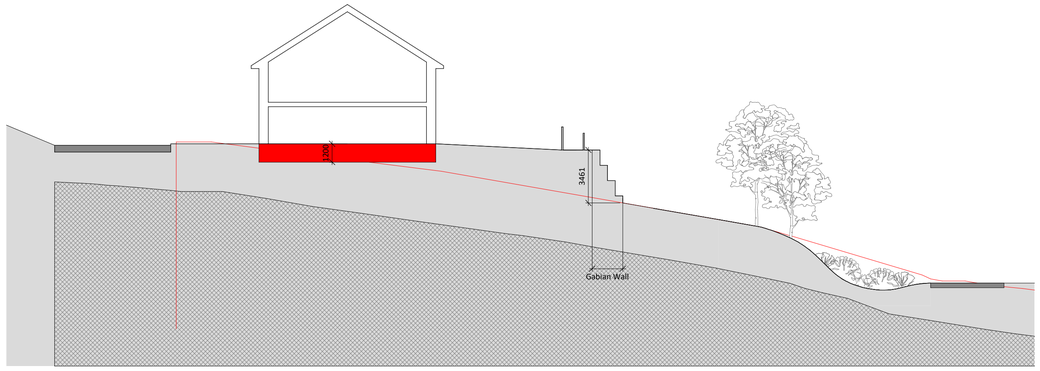

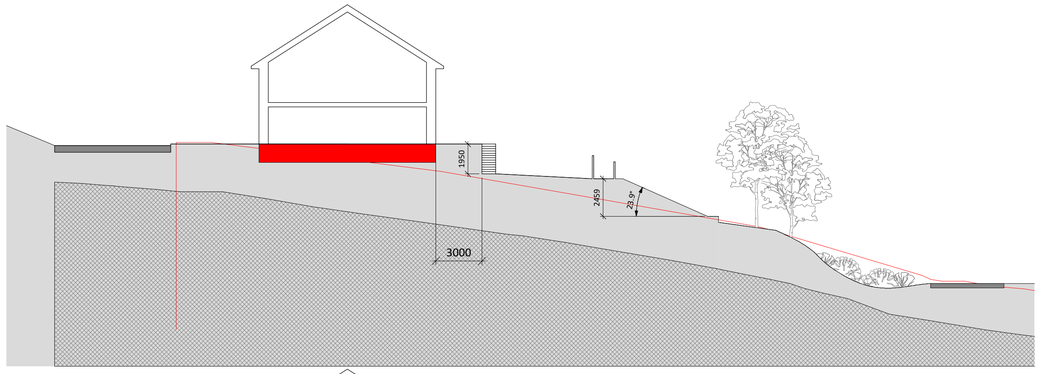

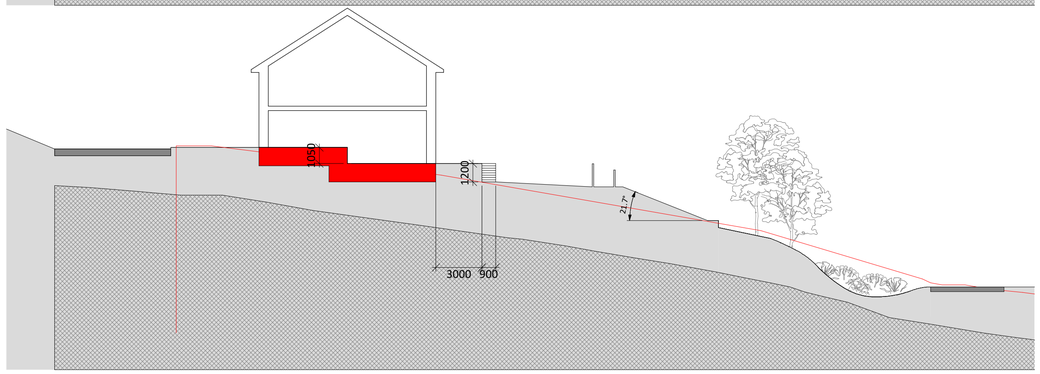

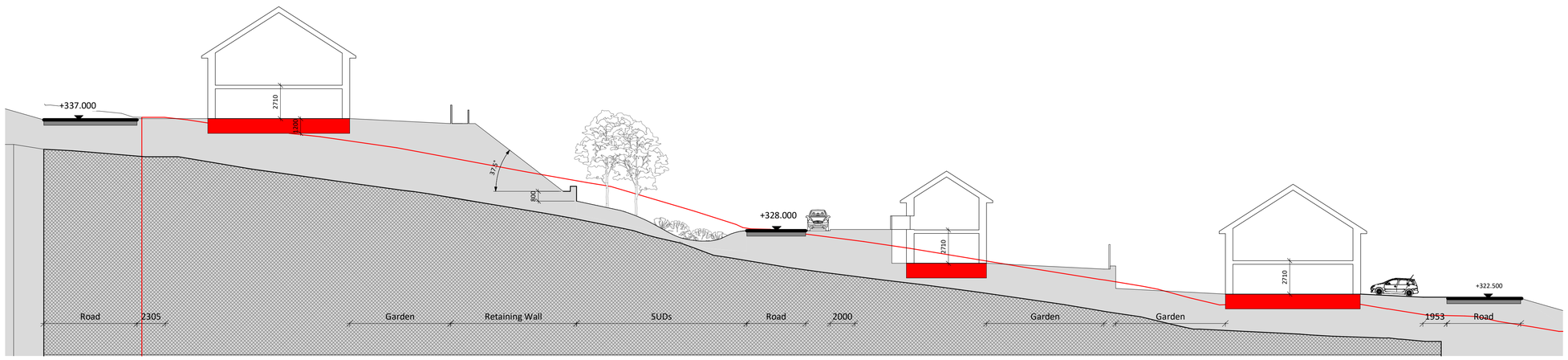

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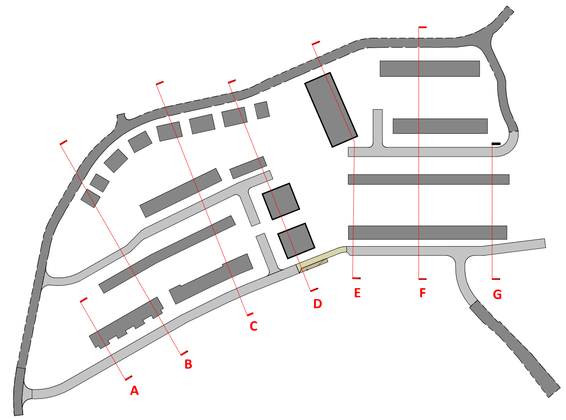

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S0	P06	07.03.2025	Draft Issue

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DRAWING TITLE
Phase 1A - Proposed Site Section B Options

STATUS CODE
S0 - WORK IN PROGRESS

SCALE
As indicated
@A1

PROJECT - ORIGINATOR - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER	STATUS_REVISION
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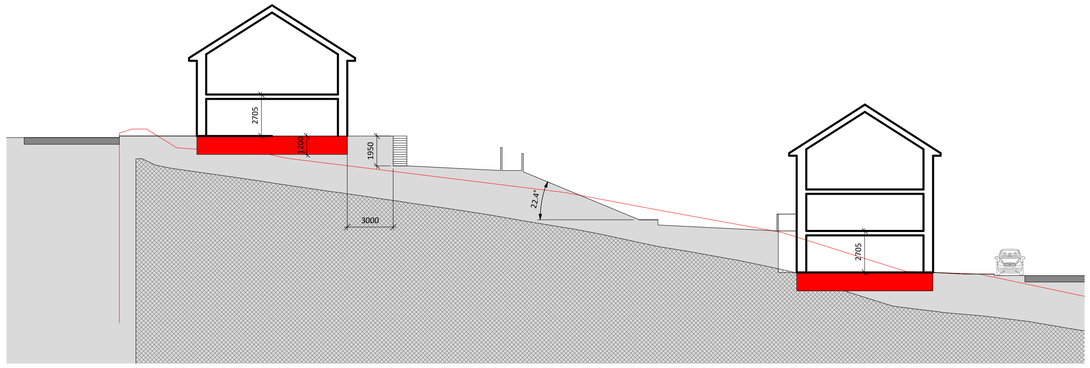

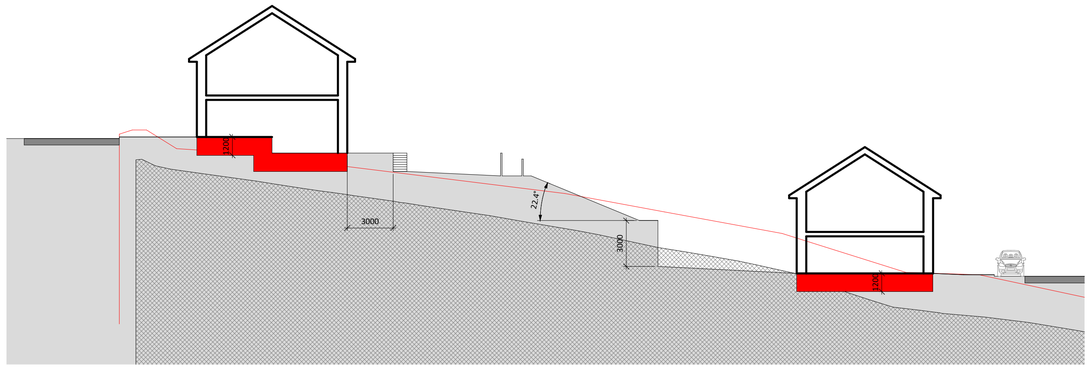

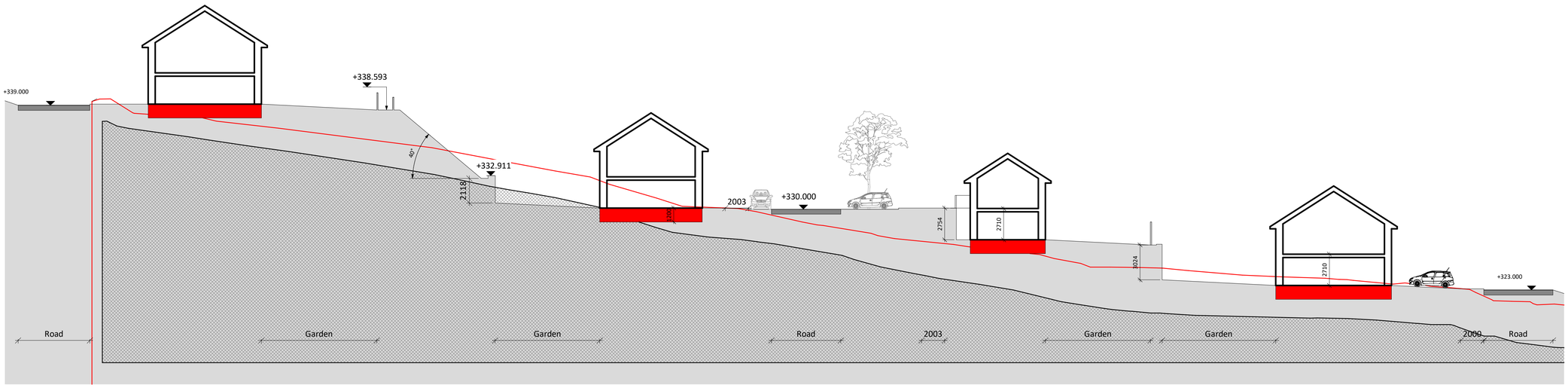

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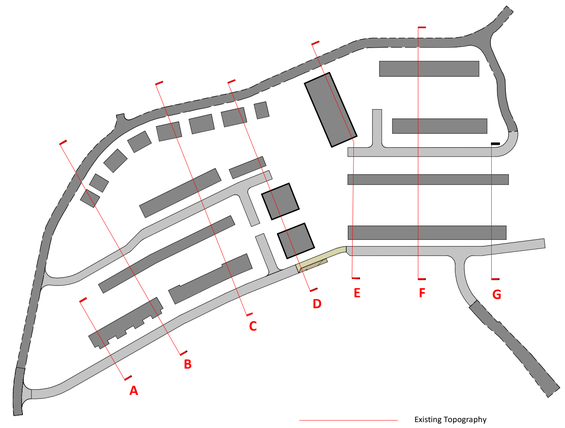

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S0	P06	07.03.2025	Draft Issue

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DRAWING TITLE
Phase 1A - Proposed Site Section C Options

STATUS CODE
S0 - WORK IN PROGRESS

SCALE
As indicated
@A1

PROJECT - ORIGINATOR - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER
156757-STL-XX-XX-DR-A-04002

STATUS_REVISION
S0_P06

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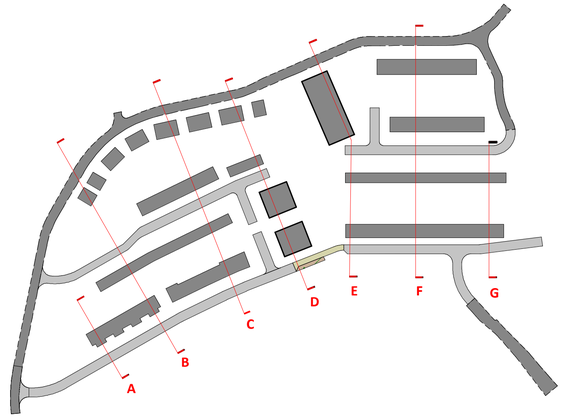


Existing Topography

Proposed Topography

Foundation

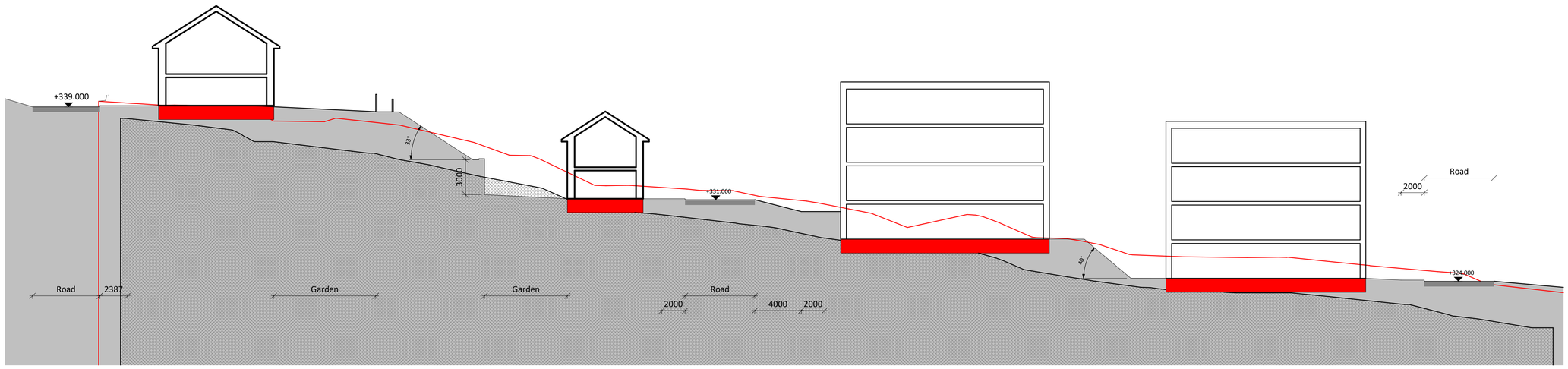
Fill

Rock Head

Proposed

WIP

DRAFT



Section D

1 : 200

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Phase 1A - Proposed Site Section D Options

STATUS CODE

S0 - WORK IN PROGRESS

SCALE

As indicated
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PROJECT - ORIGINATOR - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER	STATUS_REVISION
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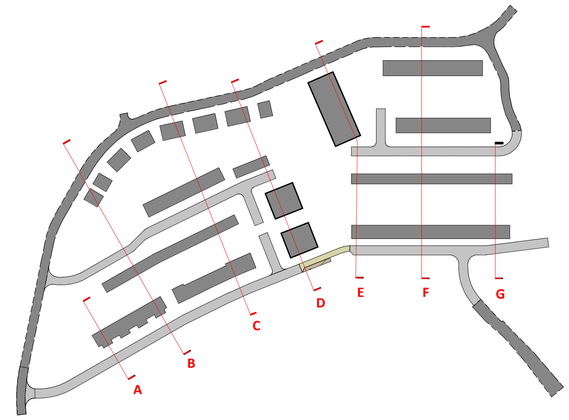
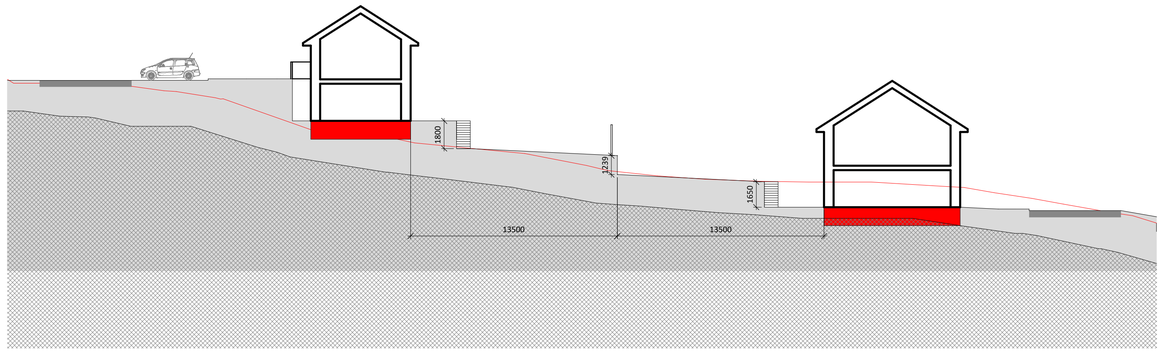
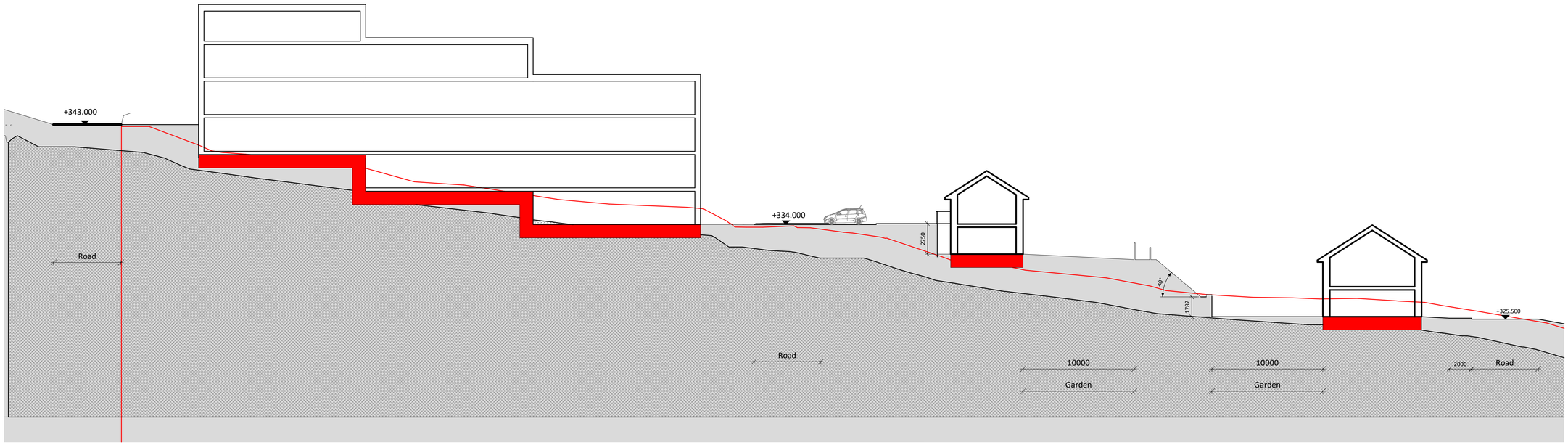


Existing Topography
Proposed Topography
Foundation
Fill
Rock Head
Proposed

WIP
DRAFT





Section E
1 : 200

STATUS	REV	DATE	DESCRIPTION
S0	P06	07.03.2025	Draft Issue

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Penrhys,
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DRAWING TITLE
Phase 1A - Proposed Site Section E Options

STATUS CODE
S0 - WORK IN PROGRESS

SCALE
As indicated
@A1

PROJECT - ORIGINATOR - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER	STATUS_REVISION
156757-STL-XX-XX-DR-A-04004	S0_P06

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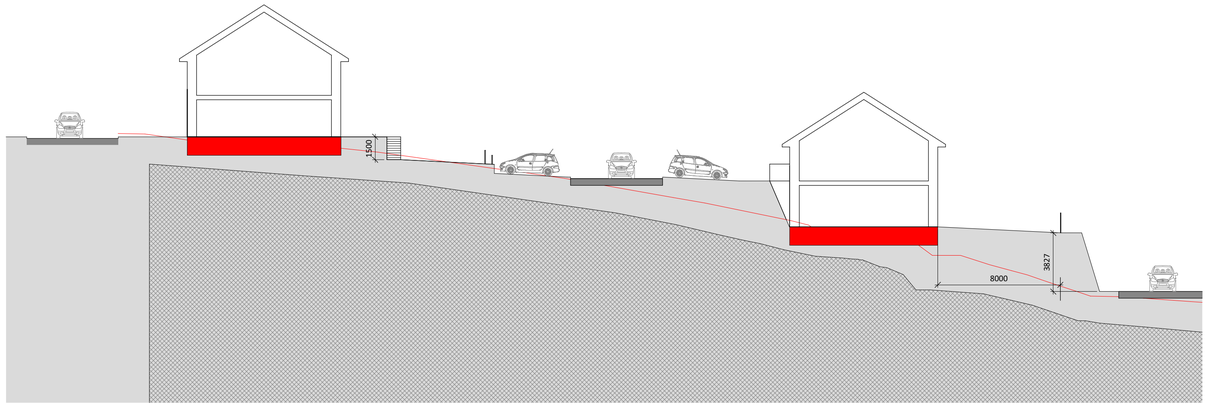
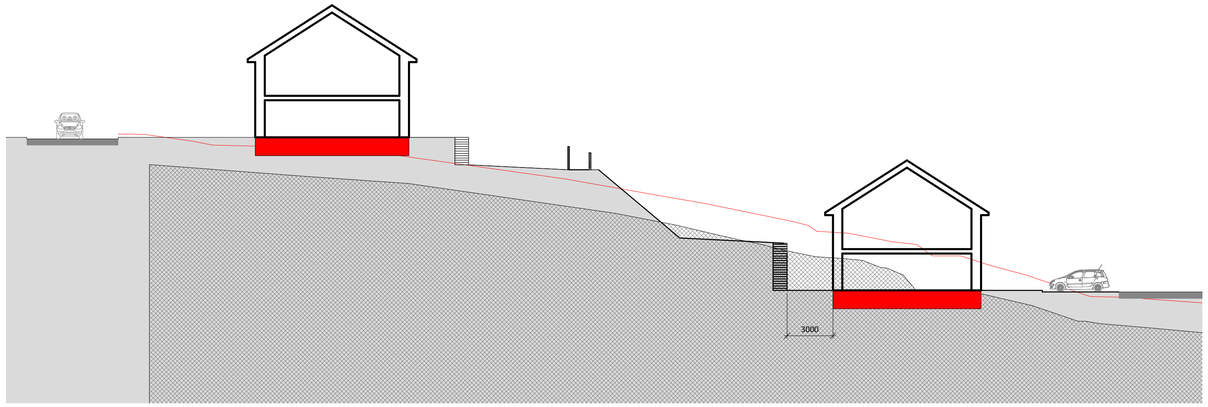
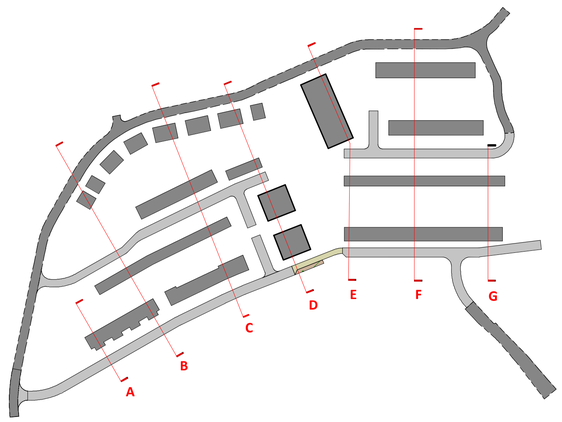


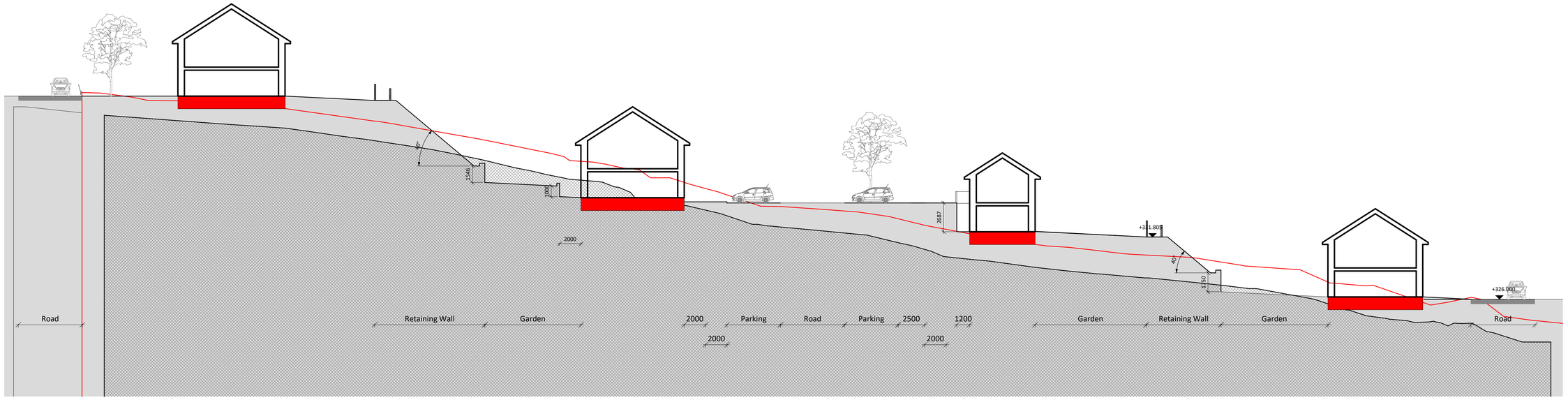




Existing Topography
Proposed Topography
Foundation
Fill
Rock Head
Proposed

WIP

DRAFT



Section F

1 : 200

TITLE: Phase 1A - Proposed Site Section F Options
PROJECT: Penrhys Residential
CLIENT: Trivallis

REVISED BY: SAH
CHECKED BY: RB
PROJECT NO: 156757

STATUS:
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SCALE (A1): As indicated

DRAWING NUMBER:
156757-STL-XX-XX-DR-A-04005
REVISION: S0_P06

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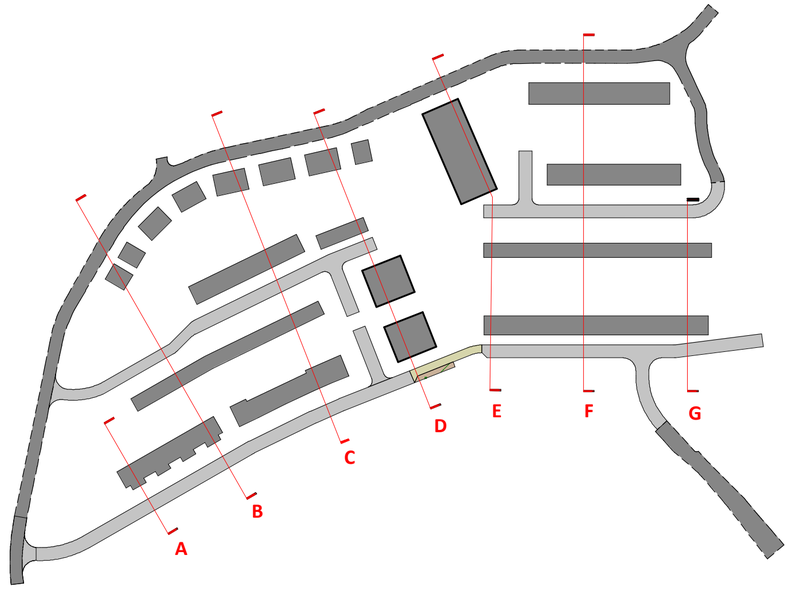


Existing Topography

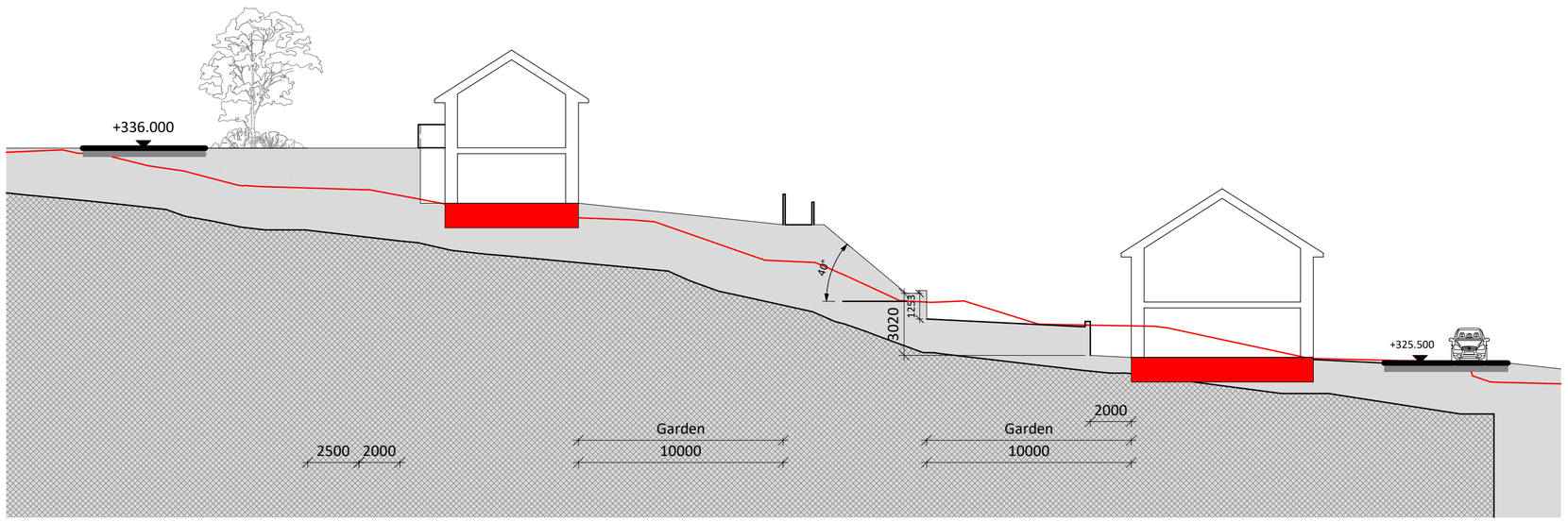
Proposed Topography

Foundation

Fill

Rock Head

Proposed



Section G
1 : 200

WIP
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S0	P06	07.03.2025	Draft Issue

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Phase 1A - Proposed Site Section G Options

SUITABILITY STATUS
S0 - WORK IN PROGRESS

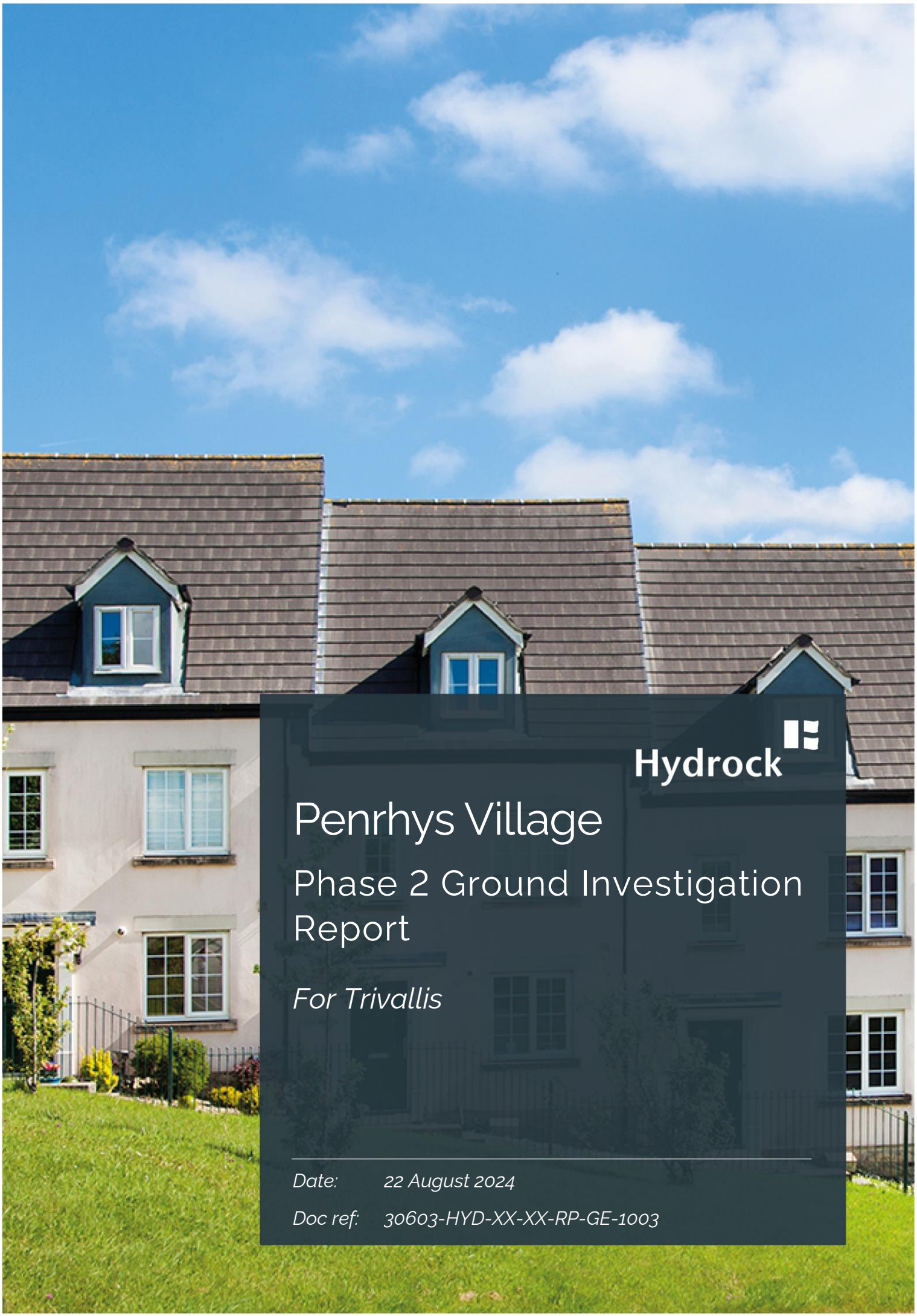
SCALE
As indicated
@A3

PROJECT - ORIGIN. - FUNCTION - SPATIAL - FORM - DISCIPLINE - NUMBER
156757-STL-XX-XX-DR-A-04006

STATUS_REVISION
S0_P06

Appendix B Previous Reports

Hydrock Consultants Ltd., August 2024. 'Penrhys Village, Phase 2 Ground Investigation Report'. Ref: 30603-HYD-XX-XX-RP-GE-1003, for Trivallis;



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Penrhys Village

Phase 2 Ground Investigation Report

For Trivallis

Date: *22 August 2024*

Doc ref: *30603-HYD-XX-XX-RP-GE-1003*

Document control sheet

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Client	Trivallis	
Project name	Penrhys Village	
Project title	Phase 2 Ground Investigation Report	
BIM reference	30603-HYD-XX-XX-RP-GE-1003	
Project reference	30603	
Date	22/08/2024	

Document production record		
Issue Number	S2 P1	*Name*
Prepared by		Emily Wareing BSc (Hons) MSc FGS
Checked by		Kurt Gilmore BSc (Hons) FGS
Approved by		Alexandra Edwards BSc (Hons) MSc FGS

Document revision record			
Issue Number	*Status*	*Date*	*Revision Details*
P1	S1	28/06/2024	Draft (awaiting geotechnical laboratory results)
P1	S2	22/08/2024	First issue of completed report.

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Appendix B Geotechnical Engineering Factual Ground Investigation Report

Appendix C Geotechnical Assessments

Appendix D Ground Gas Monitoring Assessments

Appendix E Contamination Assessments

Appendix F Waste assessment

Appendix G Preliminary geotechnical risk register

Appendix H Plausible source-pathway-receptor contaminant linkages

Executive summary

Site information and setting	
Objectives	The objectives of the initial Phase 2 Ground Investigation are; » to resolve any geotechnical and geoenvironmental uncertainties identified in the Phase 1 Desk Study by refining and updating the preliminary Ground Model, based on the conditions met in accordance with the principles of Environment Agency (EA) 'Land Contamination: Risk Management' (LCRM) (2023); » to identify any geo-environmental mitigation requirements to enable development to progress; and » to provide preliminary geotechnical recommendations for design.
Client	Trivallis.
Site name and location	Penrhys Village, Rhondda Cynon Taff, Penrhys Road, Penrhys, Ferndale, CF43 3RN.
Proposed development	Hydrock understands that the development proposals are on-going but it is expected to comprise nearly 900 homes with recreational and sports facilities, allotments, outdoor recreation trails, a new primary school, bio-swales, and a renewable energy infrastructure.
Site description	The site is irregular in shape, and has an approximate area of 29.86 hectares.
Desk study summary	
Topography	The site is located on Penrhys Hill, and slopes to the south.
Hydrology	The Rhondda River lies in the valley to the west of the site, and the Afon Rhondda Fach lies in the valley to the east of the site.
Site History	The northern area of the site was first occupied by a social housing estate circa 1974, but prior to this was open land. The land in the south of the site is undeveloped.
Geology	Superficial: None. Solid: Rhondda Member.
Anthropomorphic geotechnical hazards	The site is within an area of the South Wales Coalfield, and has been historically mined for coal at 181m below ground level (bgl) and at greater depths. Landslides have been recorded on the slopes in the area around the site, most significantly to the east of the village.
Hydrogeology	Solid: Rhondda Member, Secondary A Aquifer.
UXO risk	A non-specialist UXO assessment indicates a low bomb risk.
Preliminary conceptual site model based on desk study	
Potential contaminant sources	» Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01).

	» PCBs and oils from transformers in the electricity sub-station on site (S02). » Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03). » Asbestos within existing buildings / structures (S04). » Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes (S05). » Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06). » Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network (S07). » Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).
Potential contaminant linkages (for receptors for which there is or will be a pathway)	» People (neighbours, site end users) (R01). » Development end use (buildings, utilities and landscaping) (R02). » Groundwater: Secondary A aquifer status of the Rhondda Member (R03). » Surface water bodies: River Rhondda and the Afon Rhondda Fach (R04).
Ground model proven by investigation	
Ground and groundwater conditions encountered by investigation	The ground conditions as proven by the investigation (s) undertaken at the site comprise: » Made Ground – recorded to depths of between 0.3m and 4.40m below ground level (bgl), comprising gravels and clays with builders' rubble, brick, concrete and metal. » Rhondda Member– recorded to a maximum depth of 9.80m comprising a medium strong grey fine to medium Sandstone. Groundwater was generally not encountered during the ground investigation and post investigation monitoring. TP215 recorded a minor seepage of perched water at 2.50m bgl within Made Ground. BH307 recorded groundwater at 2.50m – 7.00m bgl during post fieldwork monitoring. It is generally thought that the groundwater on site is present at significant depth. All other monitoring wells have been recorded as dry.
Final ground model contaminant sources	» Made Ground, associated with historical construction activities, possibly including PAH (S01). » Asbestos within existing buildings / structures (S04). » Asbestos associated with the boiler house in the north of the site (S05). » Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06). » Asbestos Containing Materials associated with gaskets on the former pipe work of the district heat network (S07). » Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).

	» Petroleum hydrocarbons and VOC/SVOC in groundwater below the site (S09).
Summary of geotechnical conclusions	
Groundwork	Obstructions associated with the former / current Penrhys residential development, including foundations, floor slabs and services, should be anticipated. The extent of obstruction is expected to lessen south of the statue where there has been limited previous development. Excavation to proposed founding depth generally should be readily achievable with standard excavation plant. Heavy duty excavation plant/breaking equipment may be required to excavate the buried obstruction and where progression into intact rock strata is required. Trial pit faces were noted to remain generally vertical without collapse. Spalling and side wall collapses mainly occurred where an increase of demolition material was present within the Made Ground Water seepages into excavations are unlikely to be adequately controlled by sump pumping.
Foundations	Foundations are recommended to comprise: » Shallow foundations where Made Ground is less than 2.5m thick: » Where Made Ground is greater than 2.5m thick the use of concrete man hole rings placed onto the Rhondda member connected with ring beams; or » turn over specification to remove obstructions and remediate the Made Ground. A safe net bearing pressure Allowable net bearing pressure of 150 kN/m^2 should be available for shallow foundations up to 1m in width. When founding directly onto the Rhondda Member.
Roads and pavements	For road / pavement design, a design CBR of 3 % is recommended.
Sustainable drainage	Soakaway drainage is considered suitable when soakaways are placed into the natural Rhondda Member.
Buried concrete	Shallow soils (Made Ground) are classified as Design Sulfate Class DS-1 and ACEC Class AC-1.
Summary of geo-environmental assessment	
Human Health	Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(ah)anthracene, and Indeno(123cd)pyrene has been recorded within the Made Ground beneath the road and requires further assessment.
Phytotoxicity	No contaminants of potential concern identified for the PH7< scenario.
Controlled waters	For the majority of the site whilst there are concentrations of Chemicals of Potential Concern elevated above the water quality criteria in leachate testing, based on the remediation and investigation works undertaken to date and subject to agreement with Natural Resources Wales, Hydrock does not believe the majority of the site poses a significant risk to Controlled Waters. However, post investigation we have recorded elevated hydrocarbons in the recovered water samples from BH307 in the far south of the site. This monitoring and

	assessment are on-going and will be assessed and reported in a separate technical note once complete.
Radon:	The site is in a Radon Affected Area (1 to 3% of existing homes affected). No radon protection measures are required for new developments in this area.
Potable water supply pipes	Brownfield site and the presumption in the guidance is that barrier pipe will be used. However, the investigation and assessment has indicated no significant Contaminants of Concern and as such standard pipework may be suitable for the site following negotiations with the supply company.
Ground gases or vapours:	Low risk from ground gases, provisionally CS1 conditions across the majority of the site. Further assessment of VOC/SVOC risk is required in the far south as BH307 has recorded reduced oxygen percentage, however, at present there are no proposed occupied buildings in this part of the site and therefore no significant risk to end users. If the development layout changes then this would need to be revisited..
Enabling works	
Proposed mitigation measures	The mitigation measures proposed to remove unacceptable risks include: » Due to the exceedances recorded beneath existing roadways soils excavated from these areas should not be placed at surface within areas of soft landscaping. If Made Ground is placed beneath areas of proposed soft landscaping due to changes in the master-planning then allowance should be made for the installation of a 600mm cover system in gardens comprising a subsoil beneath a topsoil thickness of between 150mm and 300mm. However, in the first instance additional sampling of these materials is suggest to better understand the distribution across the site. (PL1) » Removal of fly tipped waste and bonfire remnants and additional testing to confirm no residual contamination (PL2 and PL5) » Asbestos Survey of existing housing and Boiler House (PL3) » Hand Picking of asbestos gaskets during the removal of the heating network (PL4) » Potentially installation of vapour protection membrane in new buildings if present in the far south of the site (PL6). The methodology for the remediation should be presented in a Remediation Strategy, which will need to be submitted to the warranty provider and the regulatory authorities for approval. Verification reports by a competent independent geo-environmental specialist will be required following completion of any remedial works.
Waste management	Excavated soils to be disposed of as waste, are likely to be classed as non-hazardous.
Future considerations	
Further work	Following the ground investigation works undertaken to date, the following further works will be required: » demolition asbestos survey; » additional ground investigation is recommended once the development layout is fully understood.

- discussion with specialists with regard to invasive species including Himalayan Balsam and Japanese Knotweed;
- completion of the on-going gas monitoring and groundwater sampling at BH307 to investigate the presence of petroleum hydrocarbons and SVOC/VOCs;
- discussion and agreement with utility providers regarding the materials suitable for pipework;
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report;
- Compilation of Remediation Strategy and Verification plan
- Compilation of material management plan
- Compilation of Geotechnical Design Report to include foundations (where deeper than 2.5m), earthworks, and retaining wall design.
- turn over method specification for dealing with obstructions across the site.
- remediation and mitigation works; and
- verification of the earthworks, remediation and mitigation works.

This Executive Summary forms part of Hydrock Consultants Limited report number 30603-HYD-XX-XX-RP-GE-1003 and should not be used as a separate document.

1. Introduction

1.1 Terms of reference

In September 2023, Hydrock Consultants Limited (Hydrock) was commissioned by Trivallis (the Client) to undertake site investigation, comprising a Phase 1 desk study and Phase 2 initial ground investigation at Penrhys Village. The site is located at Penrhys Road, Penrhys, Ferndale, CF43 3RN.

The site is currently separated into two areas; the northern area of the site comprises approximately 268 homes, most of which are social housing, a primary school, two play areas, a convenience store and a fast-food takeaway. The southern area of the site is open green space, that features the statue of Our Lady of Penrhys, and an open-air amphitheatre.

Hydrock has previously undertaken a Due Diligence Review for this site (30603-HYD-XX-XX-RP-GE-1000-S2-P1, dated 31 July 2023), a Phase 1 Ground Conditions Desk Study (30603-HYD-XX-XX-RP-GE-1001-S2-P2, dated 9 November 2023) and an Abnormal Costs Review (30603-HYD-XX-XX-RP-GE-1002-S2-P1, dated 8 March 2024).

Hydrock understands that the proposed development is to comprise 900 new homes, sport facilities and recreational areas and a new primary school. A proposed development layout (The Urbanists Drawing 2238-URB-XX-XX-DR-UD-001), is presented in Appendix A. Hydrock understands that development proposals are preliminary, and as such further site investigation and reassessment of the risk assessment in this report may be required following confirmation of site masterplans.

The investigation works have been undertaken in accordance with Hydrock's proposal referenced (30603 – Penrhys Village, Rhondda Cynon Taff – Fee proposal for Geo Consultancy Phase 1 and Initial Phase 2 Ground Investigation, dated 22 June 2023) and the Client's instructions to proceed (Ref: email from Rachel Leigh of Trivallis, dated 20 September 2023).

1.2 Objectives

The works have been commissioned to support development planning, and establish the extent of contamination (if present) at the site.

The objectives of the Phase 2 Ground Investigation are:

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

1.3 Scope

The site investigation includes a Phase 2 Ground Investigation.

The scope of the Phase 2 Ground Investigation comprises:

- a preliminary ground investigation including trial pitting, and rotary drilling to:
  - obtain data on the ground and groundwater conditions of the site;
  - allow collection of samples for geotechnical and chemical laboratory analysis;
  - allow geotechnical field tests to be undertaken;
  - install gas and groundwater wells;

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

1.4 Regulatory context and guidance

The investigation work has been carried out in general compliance with recognised best practice, including (but not limited to) BS 5930:2015, BS 10175:2011+A2:2017 and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The geo-environmental section of this report is written in broad accordance with BS 10175:2011+A2:2017, EA LCRM (2023) and the AGS (2006) 'Good Practice Guidelines for Site Investigations'.

The methods used follow a risk-based approach, the first stage of which is a Phase 1 desk study and field reconnaissance, with any potential geo-environmental risks assessed qualitatively. This is done using the 'source-pathway-receptor contaminant linkage' concept to assess risk as introduced in the Environmental Protection Act 1990 (EPA, 1990). Any potential geotechnical risks are also assessed from the Phase 1 desk study and site reconnaissance stage.

Phase 2 comprises intrusive ground investigation work and testing. The factual information from the desk study and the ground investigation are used to develop the Conceptual Site Model (CSM). This CSM is based on a ground model of the site physical conditions and an exposure model of the possible contaminant linkages. The CSM forms the basis for Generic Quantitative Risk Assessment (GQRA) in accordance with current guidelines. This GQRA might lead to more Detailed Quantitative Risk Assessment (DQRA).

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

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

Where relevant the relevant requirements of the current edition of NHBC Standards have also been applied.

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

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

2. Phase 1 Desk Study Summary

2.1 Site History

The site is split into two areas; the northern area comprises the land within the ring road that surrounds the current housing estate, the southern area is open green space.

Historically, the north of the site was open fields and marshland, labelled as Erw Beddau, Site of Battle (c.1875). The existing housing estate was constructed c. 1974, and included the construction of a school and Police Station. Partial demolition of the housing estate is recorded on maps in 1974 in the north-east of the site, followed by further demolition, halving the number of homes on the site in 2010.

The southern area of the site has remained undeveloped.

2.2 Geology

The site is shown on British Geological Survey (BGS) maps reproduced as part of the Groundsure environmental report, which indicates the site is underlain by green-grey pennant sandstones of the Rhondda Member with thin interbedded mudstone and siltstone, and thin coal pairings.

2.3 Hydrogeology

The solid geology of the Rhondda Member is classed as a Secondary A Aquifer. There are no active groundwater abstraction licences within 1km of the site, and the site is not within a groundwater Source Protection Zone (SPZ).

Shallow groundwater is anticipated to be present within the Made Ground in the northern section of the site, with a deeper groundwater body in the Rhondda Member bedrock. Groundwater migration is expected to be influenced by topography, and flow southerly down Penrhys Hill. Regionally, groundwater is expected to be flowing south towards the Severn Estuary. Recharge to the groundwater body below the site is expected to be inhibited by the extensive hardstanding which spans much of the Penrhys housing estate.

The groundwater body beneath the site (South East Valleys Carboniferous Coal Measures) is currently (2021 Cycle 3) classified under the Water Framework Directive (WFD) as 'poor', due to 'chemical dependant groundwater body' conditions.

The environmental report indicates a negligible risk of groundwater flooding.

2.4 Hydrology

There are 3 records of inland rivers on site – these relate to surface water drains in the areas of existing and former housing. There are 7 further records of inland rivers within 10m of the site boundaries. A spring network which connects to the Rhondda River lies circa 60m to 248m south-west of the site. A further inland stream network lies circa 159m to 221m north-east of the site.

2.5 Mining

The site lies within a 'Coal Mining Reporting Area' but lies outside the Coal Authority's 'Development High Risk Area'. A Consultants Coal Mining Report was obtained by Hydrock from the Coal Authority which indicated there were no known shallow workings of the No.2 Rhondda and Two Ft Nine seam which run below the site at 181m and 402m below ground level respectively. Any past coal mining in the area below the site is at sufficient depth that it poses a low risk to new development.

3. Initial conceptual site model

3.1 Geotechnical hazard identification

3.1.1 Context

The Hydrock Phase 1 Ground Conditions Desk Study (2023) provides the identified plausible geotechnical hazards that may be present at this site, and the elements of the development potentially affected.

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

3.1.2 Plausible geotechnical hazards

Plausible geotechnical hazards identified at the site are:

- Uncontrolled Made Ground (variable strength and compressibility).
- Soft / loose compressible ground (low strength and high settlement potential).
- Variable lateral and vertical changes in ground conditions.
- Attack of buried concrete by aggressive ground conditions.
- Adverse chemical ground conditions, (e.g. expansive slag).
- Obstructions.
- Loose Made Ground, leading to difficulty with excavation and collapse of side walls.
- Slope stability issues – general slopes.
- Slope stability issues – retaining walls.
- Earthworks – poor bearing capacity of new fill / unsuitability of site won material to be reused as fill.

3.1.3 Potential development elements affected

Development elements potentially affected by geotechnical hazards are:

- Buildings – foundations.
- Buildings – floor Slabs
- Roads and pavements.
- Services.
- General slopes.
- Retaining walls.
- Gardens.
- Construction staff, vehicles and plant operators.
- Concrete below ground.
- Earthworks control, inability to place and compact fill / insufficient fill to complete earthworks.

Health and safety risks to site Contractors and maintenance workers were not assessed during the desk study and will need to be considered separately during design.

3.2 Geo-environmental exposure model

3.2.1 Context

The initial Conceptual Site Model (iCSM) for Penrhys Village was presented in the Hydrock Phase 1 Ground Conditions Desk Study.

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

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

3.2.2 Potential contaminants

3.2.2.1 Potential on-site sources of contamination

- Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of metals, metalloids, asbestos fibres, Asbestos Containing Materials, PAH and petroleum hydrocarbons (S01).
- PCBs and oils from transformers in the electricity sub-stations on site (S02).
- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03).
- Asbestos within existing buildings / structures (S04)
- Hydrocarbon fuels, lubricants, solvents and asbestos associated with the boiler house in the north of the site and potentially across the heating network area from leaking/damaged pipes (S05).
- Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06).
- Made Ground containing asbestos and Asbestos Containing Materials associated with the demolition of former pipe work from the district heat network (S07).
- Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).

3.2.2.2 Potential off-site sources of contamination

No potential off-site sources of contamination were identified.

3.2.3 Potential receptors

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

- People (neighbours, site end users) (R01).
- Development end use (buildings, utilities and landscaping) (R02).
- Groundwater: Secondary A aquifer status of the Rhondda Member (R03).
- Surface water bodies: River Rhondda and the Afon Rhondda Fach (R04).

3.2.4 Potential pathways

The following potential pathways were identified in the desk study.

- Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).
- Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps (P02).
- Surface water via overland flow (P03).
- Surface water, via drainage discharge (P04).

- Surface water via base flow from groundwater (P05).
- Migration of contaminant via leachate migration through the unsaturated zone into the Rhondda Member Sandstone (P06).

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

The above sources, pathways and receptors have been considered as part of the Preliminary Risk Assessment in accordance with LCRM (2023), are considered to be plausible in the context of this site and have been carried forward for investigation and assessment.

4. Ground investigations

4.1 Site works

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

The fieldwork took place between 15 April 2024 and 10 May 2024 and was completed by a sub-contractor; Geotechnical Engineering Ltd (GEL). The ground investigation locations were surveyed by GEL and is recorded within the appended Factual Report in Appendix B.

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

Table 4.1: Summary of site works

Activity	Method	No.	Name	Depth Maximum / Range (m bgl)	In situ tests	Rationale
Drilling, Pitting and Probing						
Boreholes	Rotary cored	7	BH301-BH307	9.3 -9.8	SPT	To investigate strength profile of the Made Ground and natural strata.
Trial pits	Machine	3	TP101, TP102, TP107	0.6-1.0	-	To target the district heat network for collection of samples.
		20	TP201-TP220	0.5-3.5	-	For general site coverage and collection of samples.
	Hand-excavated	1	TP106	0.3	-	To undertake trial pits where service clearance could not be obtained.
Probes	TRL dynamic cone penetrometer	17	DCP 201-202, DCP 204-208, DCP 210-214, DCP 216-220	-	California Bearing Ratio (CBR)	-
Other in situ testing or monitoring						**Comment/s**
Infiltration	BRE 365	5	In 5.no trial pits.	-	BRE 365 infiltration	In TPs 201, 204, 212, 216, 219.

Wells for monitoring groundwater levels and ground gas concentrations were installed in a number of the boreholes. A summary of the monitoring well installations is presented in Table 4.2.

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Table 4.2: Summary of monitoring installations

Location	Ground level (m OD)	Standpipe / piezometer diameter	Screen top and base depth (m bgl)	Strata targeted
BH301	335.60	50mm	1.00 to 2.50	Made Ground
BH302B	345.35	50mm	2.80 to 9.30	Rhondda Member
BH303B	341.05	50mm	1.00 to 2.40	Made Ground
BH304	310.00	50mm	1.00 to 3.60	Made Ground
BH305	320.75	50mm	1.00 to 3.20	Made Ground
BH306	311.10	50mm	3.00 to 8.20	Rhondda Member
BH307	285.10	50mm	1.40 to 9.50	Rhondda Member

4.2 Geo-environmental testing

4.2.1 Sampling strategy and protocols

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

Certain features, such as the district heating network in the roadway, were targeted for specific investigation, but a reasonably even spacing was used for the remainder of the site.

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

4.2.2 Geo-environmental monitoring

Gas monitoring of boreholes has been undertaken on 6 occasions. The results are presented in the Factual Report in Appendix B.

There is on-going gas and groundwater monitoring in BH307 in the far south of the site due to presence of hydrocarbons identified during monitoring rounds, a separate technical note will be produced once the monitoring is complete.

4.2.3 Geo-environmental laboratory analyses

The chemical test certificates for testing undertaken as part of the investigation undertaken by Geotechnical Engineering Ltd (GEL) are provided in Appendix B. and summarised in the table below. Wherever possible, UKAS and MCERTS accredited procedures have been used.

The chemical test certificates for testing undertaken as part of historical investigations are provided in the relevant reports in Appendix E.

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

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Table 4.3: Geo-environmental analyses of soils

Determinand Suite	Made Ground	Topsoil	Rhondda Member
Hydrock minimum suite of determinands for solids*	28	1	4

*Hydrock minimum soil suite comprises: As, B (water soluble), Be, Cd, Cr (total), Cr (VI), Cu, Hg, Ni, Pb, S (elemental), Se, V, Zn, cyanide (total), sulfide, pH, asbestos fibres, speciated polynuclear aromatic hydrocarbons (PAH, by GC-FID), total phenols and fraction of organic carbon

The soils chemical test data are interpreted and assessed in Section 7.

The geo-environmental analyses undertaken as part of the investigation on soil leachates are summarised in Table 4.4.

Table 4.4: Geo-environmental analyses of soil leachates

Determinand Suite	Soil leachates
Hydrock minimum suite of determinands for waters	12

4.3 Geotechnical testing

The geotechnical tests undertaken by GEL are summarised in Table 4.5 and the test certificates are provided in Appendix B. Wherever possible, UKAS accredited procedures have been used.

Table 4.5: Summary of sample numbers for geotechnical tests

Test	Made Ground	Topsoil	Rhondda Member
Natural moisture content	5	-	-
Atterberg limits	5	-	-
Particle size distribution (sieve/sedimentation)	30	1	5
Sulfate and aggressive chemical environment for buried concrete classification (full BRE SD1 suite)	10	-	-
Rock water content	-	-	4
Uniaxial compressive strength (UCS)	-	-	4
Point load strength	-	-	22

4.4 Constraints

The footprints of the existing houses / buildings could not be investigated as most buildings were still in use, preventing intrusive ground investigation in these areas. Access to the boiler house was not obtained by Trivallis, and therefore it is challenging to assess fully where the district heat network extends from in this area, and the extent of potentially localised ground contamination associated with fuel and solvent leaks from the time that the boiler house was in operation.

4 of the proposed trial pits which were intended to be undertaken in the roadway around the site, were abandoned – 3 of these were due to buried services, and these positions could not justifiably be relocated.

5. Ground investigation records and data

5.1 Physical ground conditions

5.1.1 Summary of strata encountered

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

All relevant data from the GEL investigation discussed in Section 4 are used from this point forward for Hydrock's interpretation.

Details of the GEL ground investigation works are provided within the factual report in Appendix B . A summary of the ground model is presented in Table 5.1 and the individual strata are described in the sections below.

Table 5.1: Strata encountered

Stratum	Depth to top (m bgl)	Depth to base (m bgl)	Thickness (m) (range)	Thickness (m) (average)
General Made Ground	0.00	0.3 – 4.40	0.06 – 4.40	1.86
Topsoil	0.00	0.20 – 0.60	0.20 - 0.60	0.35
Rhondda Member	0.60 - 4.40	9.5 - 9.80	5.10 - 8.10	6.79

5.1.2 Surface covering

The following surface cover was identified during site works:

- Concrete hardstanding,
- Tarmacadam hardstanding,
- Structures (houses and garages)
- Vegetation (grass, trees, brambles),

5.1.3 Made Ground

Below the surface covering, Made Ground was recorded across the entirety of the northern portion of the site below the housing estate, to a maximum thickness of 4.40m below ground level. Made Ground generally comprised builders' rubble, brick, concrete and metal.

It should be noted that all grassed areas of the northern portion of the site recorded a darker more organic upper soil horizon. However due to the inclusion of anthropogenic material this should not be confused as topsoil and has therefore been considered as part of the General Made Ground.

5.1.4 Topsoil

Where the Made Ground was not encountered, in the southern area of the site, the exploratory holes encountered topsoil.

Topsoil was between 0.20m and 0.60m thick, with an average thickness of 0.35m. The topsoil comprised soft brown sandy silty clay with rootlets.

For the purposes of this report, topsoil is defined as the upper layer of an in-situ soil profile, usually darker in colour and more fertile than the layer below (subsoil), which is a product of natural chemical, physical, biological and environmental processes, but does not imply compliance with BS 3882:2015. Reuse of topsoil as a growing medium at the site should be determined by the landscape architect or the landscape Contractors.

5.1.5 *Rhondda Member*

The Rhondda Member was encountered underlying the Made Ground in the northern zone of the site, and underlying topsoil in the southern zone of the site. The Rhondda Member has a maximum recorded thickness of 8.10m (base unproven), with an average thickness of 6.06m.

5.2 Obstructions

Obstructions were encountered in a number of boreholes and trial pits during the investigation. These intrusive locations are summarised in Table 5.2.

Table 5.2: Obstructions encountered

Stratum	Location	Depth (m bgl)	Description
Made Ground	BH302	0.75	Hard man-made obstruction at base of pit, position relocated to BH302A.
Made Ground	BH302A	0.75	Hard man-made obstruction at base of pit, position relocated to BH302B.
Made Ground	BH303	0.30	Concrete at base of pit, position relocated to BH303A.
Made Ground	BH303A	0.30	Concrete at base of pit, position relocated to BH303B.
Made Ground	TP101	1.00	Hard natural strata at base of pit, position terminated.
Made Ground	TP102	0.70	Hard natural strata at base of pit, position terminated.
Made Ground	TP107	0.60	Hard natural strata at base of pit, position terminated.
Made Ground	TP201	3.00	Hard natural strata at base of pit, position terminated.
Made Ground	TP202	2.10	Hard natural strata at base of pit, position terminated.
Made Ground	TP204	2.40	Hard natural strata at base of pit, position terminated.
Made Ground	TP205	2.10	Hard natural strata at base of pit, position terminated.
Made Ground	TP206	0.60	Concrete and manhole chamber at base of pit, position relocated to TP206A.

Made Ground	TP206A	1.00	Hard natural strata at base of pit, position terminated.
Made Ground	TP207	1.40	Electricity cable strike, position relocated to TP207A.
Made Ground	TP207A	2.40	Hard natural strata at base of pit, position terminated.
Made Ground	TP208	1.10	Hard natural strata at base of pit, position terminated.
Made Ground	TP209	0.50	Manhole chamber in base of pit, position terminated.
Made Ground	TP210	2.90	Hard natural strata at base of pit, position terminated.
Made Ground	TP211	1.70	Hard natural strata at base of pit, position terminated.
Rhondda Member	TP212	2.20	Hard natural strata at base of pit, position terminated.
Made Ground	TP215	0.70	Yellow plastic 100mm gas main encountered; position terminated.
Made Ground	TP216	2.00	Hard natural strata at base of pit, position terminated.
Made Ground	TP217	2.90	Hard natural strata at base of pit, position terminated.
Rhondda Member	TP218	1.30	Hard natural strata at base of pit, position terminated.
Rhondda Member	TP219	1.30	Hard natural strata at base of pit, position terminated.
Rhondda Member	TP220	0.75	Hard natural strata at base of pit, position terminated.

5.3 Groundwater

5.3.1 Groundwater observations and levels

Groundwater encountered during the investigation is listed in Table 5.3. A groundwater observation represents the depth at which groundwater was first observed and is likely to be deeper than the actual water table level at that location. Groundwater was not encountered in any of the boreholes during the investigation.

Table 5.3: Groundwater occurrence

Stratum	Date	Location	Fieldwork		Comment
			Groundwater observation (m bgl)	Rose to after 20 mins (m bgl)	
Made Ground	29/04/24	TP214	2.50	-	Sidewalls of excavation collapsing at 2.50m bgl.

Groundwater levels recorded during post-fieldwork monitoring are summarised in Table 5.4.

Table 5.4: Groundwater level data summary

Stratum	Date range	Location	Post-fieldwork monitoring
			Depth to groundwater (range) (m bgl)
Made Ground	17/05/24 - 28/06/24	BH01	Dry
		BH303B	Dry
		BH304	Dry
		BH305	Dry
Rhondda Member	17/05/24 - 28/06/24	BH302B	Dry
		BH306	Dry
		BH307	2.50 – 6.99

5.3.2 *Infiltration tests*

The results of the infiltration testing undertaken are summarised in Table 5.5. The results sheets are presented in Appendix B.

Testing was carried out in general accordance with BRE Digest 365 (BRE DG365) (2016).

Table 5.5: Infiltration test results

Stratum	Location	Depth to base of pit (m bgl)	Infiltration rate (m/s)			
			Run 1	Run 2	Run 3	Range
Made Ground	TP201	3.00	Insufficient water intake to calculate infiltration.			
Made Ground	TP204	2.40	3.3×10^{-5}	1.0×10^{-5}	-	3.3×10^{-5} - 1.0×10^{-5}
Rhondda Member	TP212	2.20	2.5×10^{-5}	5.3×10^{-6}	3.3×10^{-6}	2.5×10^{-5} – 3.3×10^{-6}

Rhondda Member	TP216	2.20	Insufficient water intake to calculate infiltration.	3.5×10^{-5}	8.3×10^{-5}	8.3×10^{-5} - 3.5×10^{-5}
Rhondda Member	TP219	1.30	Water intake too quick to fill pit. 1000l added.			

*Where less than three tests were possible in a particular location the results provided should be considered indicative only and should not be used for design purposes. If infiltration is critical to the development of the site, multi-day infiltration testing should be undertaken.

5.3.3 *Groundwater summary*

During the investigation, groundwater was only encountered in one position: TP214 at 2.50m bgl. The water table is expected to be perched at this position, as this water level was not encountered in other locations at this depth.

Groundwater has only been encountered during monitoring at BH307 in the southern zone of the site, at a depth of circa 2.5m - 7m bgl.

Within the Rhondda Member, recorded infiltration rates were between 8.3×10^{-5} and 3.3×10^{-6}m/s.

5.4 Ground gases

Records from the gas monitoring boreholes are presented in Appendix D and summarised in Table 5.6.

6 monitoring visits have been undertaken, and as such monitoring across the majority of the site is complete. There is on-going monitoring in BH307. The data are assessed in Section 7.7.

Table 5.6: Range of ground gas data

Stratum	Methane (%)	Carbon dioxide (%)	Oxygen (%)	Steady flow rate (l/hr)	Comment
Made Ground	0.0 – 0.0	0.0 – 7.4	8.6 – 20.7	0.1 – 0.3	Minimum flow has been assumed as 0.1l/hr where no flow was recorded, as per the limit of detection for the gas analyser.
Rhondda Member	0.0 - 0.0	1.2 – 2.4	0.9 – 18.8	0.1 – 0.1	

5.5 Geotechnical data

5.5.1 *Introduction*

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

5.5.2 *Plasticity*

The volume change potentials in terms of BRE Digest 298 with respect to building near trees have been determined from the results of plasticity index tests on samples of soil. These are summarised in Table 5.7.

Table 5.7: Volume change potential

Stratum	No. of tests	Plasticity Index			**Volume change potential**
		Min.	Max.	Av.	
Made Ground	5	10	13	12 (11.6 but always reported as an integer)	Low to medium

5.5.3 *Particle size distribution*

Particle Size Distribution test (PSDs) results are summarised in Table 5.8 and summary descriptions and PSD plots of the material analysed are presented in Appendix B.

Table 5.8: PSD results summary

Stratum	No. of tests	Silt/Clay %	Sand %	Gravel %	Cobbles & boulders %	General description
Made Ground*	30	2 - 25	6 - 32	31 - 91	0 - 54	Sandy/clayey GRAVEL with cobbles and boulders.
Topsoil	1	41	28	30	0	Sandy gravelly SILT.
Rhondda Member	5	3 - 16	3 - 23	25 - 44	38 - 63	Sandy GRAVEL with cobbles and boulders.

5.5.4 *Relative density*

Table 5.9 summarises information pertaining to the relative density of the granular soils according to geological stratum. Factual results are summarised for laboratory tests, field tests (e.g. SPT, dynamic probe correlation).

Table 5.9: Relative density results and derived values

Stratum	No. of tests	Method	SPT (N-value) (Range)	phi' (°)
Made Ground	15	SPT	<1 - 231	28
Rhondda Member	15	SPT	65 - 750	-

5.5.5 *Subgrade stiffness*

The subgrade stiffness (CBR) results are summarised in Table 5.10.

Table 5.10: CBR results and derived values

Stratum	No. tests	Method	CBR (%) (Range)
Made Ground	17	TRL-DCP	2 - 70

Note that where the CBR is recorded in excess of 100% this has been disregarded as this will reflect an obstruction not subgrade stiffness characteristics.

5.5.6 *Sulfate content*

In accordance with BRE (Special Digest 1), the Design Sulfate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 5.11. The assessment summary sheets are presented in Appendix B.

Table 5.11: Aggressive chemical environment concrete classification

Stratum	No. tests	DS	ACEC
Made Ground	10	DS-1	AC-1

5.5.7 *Intact material strength – rock*

Table 5.12 summarises information pertaining to the strength of the intact rock material (not rock mass) according to geological stratum and, if applicable, weathering zones or other variations within particular strata.

Factual results are summarised for laboratory and field tests. Where point load index tests are used to infer unconfined compressive strength (UCS), this is also tabulated. Rock strength terms follow the method of BS EN ISO 14689-1:2003.

Care should be exercised in using these assumed rock strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing is required for certain purposes. The reader should refer to the original test results in Appendix B.. Note also that rock mass properties, rather than intact rock material properties, may be more suitable for design purposes.

Table 5.12: Intact rock strength results and derived values

Stratum	No. of tests	Point load index (Range)		UCS (MPa) (range)	Method
		Is	$Is_{(50)}$		
Rhondda Member	22	0.05 - >4.67	0.08 - >6.48	56.7 - 71.9	Point load correlation
	4	-	-	56.7 - 71.9	UCS test

6. Geotechnical assessment

6.1 Geotechnical categorization of the proposed development

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

The proposed development is to comprise low rise (2 to 3 storey) residential dwellings, with associated gardens, Public Open Space and infrastructure. A preliminary review of the levels indicates there may be requirements for up to 2.0m of cut and 2.5m of fill on sections of the site, with a significant number of retaining walls across the site. In addition, a review of the surface water drainage strategy indicates surface water will be retained in a surface water attenuation pond located in the south of the site.

Based on the above, for the purposes of this investigation, the proposed structures have been classed as Geotechnical Category 2, due to the significant earthworks and retaining walls proposed. If the extent of the earthworks is less than envisaged or the retaining walls are below 2m in height then it may be possible to reduce the site to a Geotechnical Category 1 rating.

Following ground investigation and as part of the assessment provided in the following section, the preliminary geotechnical hazard identification undertaken in Section 3.1 has been updated.

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

6.2 Characteristic design values

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

Table 6.1 provides characteristic geotechnical values to assist the designer. These are based on laboratory testing, *in situ* testing and by professional judgement using published data together with knowledge and experience of the ground conditions. Care should be exercised in using these assumed soil strength parameters for any purpose beyond the scope of this report because it may be that additional sampling and testing are required for certain purposes. The reader should refer to the original test results summarised in Section 4 and provided in Appendix B.

Table 6.1: Characteristic geotechnical values

Parameter Stratum	Bulk unit weight kN/m³ γ [a]	Effective angle of internal friction ° ϕ' [b c]	Effective cohesion kN/m² c' [d]	Undrained shear strength kN/m² c_u [e]	Coefficient of compressibility m²/MN m_v [f]	Modulus of subgrade reaction (IAN73/06) MN/m²/m k [g]
Made Ground	18	30	0	N/A	N/A	N/A
Rhondda Member	18-22	35-40	0	N/A	N/A	N/A

a. Estimated based on the recommendations of BS 8004-2015.

b. Internal friction (φ') values for the granular in situ material derived from SPT data following the recommendations of Peck et al., (1967).

c. Internal friction (φ') values for the cohesive in-situ material derived from BS 8004-2015, where φcv' is derived from plasticity index. The use of φcv' in the analysis is considered to provide a conservative estimate of φ'.

d. BS 8002:1994 Code of practice for Earth retaining structures, British Standards institution.

6.3 Groundwork

6.3.1 Site preparation

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

Buried obstructions were encountered during this investigation associated with foundations of old buildings, and services etc., and there is a possibility of further such obstructions being encountered.

A full investigation to delineate all obstructions on site was outside of the scope of this preliminary investigation . However, at this early stage it is expected that a phase of enabling works and a turnover specification would be the most efficient way of eliminating obstructions on site for the proposed development of housing stock.

Where Topsoil has been encountered this should be removed from beneath all building and hardstanding areas. Whilst not logged as topsoil, an organic surface layer was encountered in grass landscaped areas in the northern portion of the site, this should be removed from areas proposed to be building or hardstanding.

6.3.2 Groundworks

Following breaking out of hardstanding and obstructions, excavation of shallow soils should be readily undertaken by conventional plant and equipment. However, excavation through any buried construction and intact rock quality strata may require heavy-duty excavation plant or ripping plant.

Trial pit faces were noted to remain generally vertical without collapse. Spalling and side wall collapses mainly occurred where an increase of demolition material was present within the Made Ground

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

Temporary trench support, or battering of excavation sides, is recommended for all excavations that are to be left open for any length of time and will definitely be required where man entry is

required. Particular attention should be paid to excavation at, or close to, site boundaries/adjoining existing roads/structures/buildings, where collapse of excavation faces could have a disproportionate effect.

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

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

Based on site observations, the rate of water ingress to the proposed excavations is likely to be slow. In these circumstances, groundwater control by sump pumping is likely to be sufficient.

6.3.3 Earthworks/reuse of site-won materials

Whilst no specific earthworks testing has been undertaken, it is understood cut to fill will be required across the site however, the full extent of this is unknown. Hydrock understand that there could be up to 2m of cut in and up to 2.5m fill in some places.

6.4 Slope stability

The site is currently a mixture of flat plateaus where the previous estate houses were located and slopes that are between 1:3, with a few locations increasing to 1:2. The use of retaining walls will be required to re-create the previous flat plateaus and to help deal with the slopes on site. No formal slope stability assessment is deemed necessary at this time but this should be reviewed once proposed slope angles are known and how they interact with proposed retaining walls.

Separate geotechnical design will be required to fully assess slope stability and design of retaining features.

6.5 Retaining walls

With regard to the proposed retaining walls, Hydrock understand there will be a number of small (i.e. <2.0m in height) walls across the site. Some retaining walls may be over 2m and would have to be assessed as part of a separate Geotechnical Design report and are not covered within this report.

The construction methods for retaining walls have not been decided at the time of writing this report. However, the following recommendations are suitable for the following styles of retaining wall

- reinforced concrete
- masonry
- gabions
- crib lock

A safe bearing pressure of 50 kN/m^2 is recommended if the retaining wall is founded at a depth of 1.0 to 2.5m bgl into the weathered Rhondda Member or onto competent bedrock of the Rhondda Member. Where the Made Ground thickness is in excess of 2.5m and prevents founding on natural soils/bedrock consideration to excavate and replace or ground improvement may be required.

Design parameters are provided in Table 6.1 and the retaining walls will need to be designed by a structural engineer OR by the design and build Contractor.

Allowance should be made in the design of the retaining walls for adequate drainage behind the structure, or for water seepage through the face of the wall. The stability of the retaining wall is not considered in this report and should be considered by the designer.

6.6 Foundation type

On the basis of the ground conditions encountered, which generally recorded less than 2.5m of Made Ground over a shallow bedrock of the Rhondda Member, shallow foundations in the form of pads or trench fill foundations are recommended.

Where Made Ground has been recorded in excess of 2.5m thick, alternative foundation methods should be considered, such as;

- excavate and replacement of the Made Ground with Structural fill, for which a specification would be required;
- the use of concrete man hole rings placed onto the Rhondda member connected with ring beams; or
- turn over specification for the Made Ground, to remove obstructions and remediate the Made Ground.

Given the obstructions and type of Made Ground encountered piling is unlikely to be a successful foundation solution, and given the previous housing estate was constructed using shallow foundations it would seem sensible and more sustainable to use shallow foundations for the proposed new development.

6.6.1 Shallow Strip or Pad Foundations

Strip or trench fill foundations are considered suitable where less than 2.5m of Made Ground has been recorded. The foundations should be placed below any Made Ground and at least 300mm into the undisturbed Rhondda Member.

A safe net bearing pressure of 150kN/m^2 is considered appropriate based on trench fill or pad foundations up to 1m wide placed into the Rhondda Member. This should limit any settlement to less than 25mm. It should be noted that in some areas of the site a weathered upper section of the Rhondda Member was encountered and recorded as a medium dense sandy GRAVEL, this is considered sufficient to support the above recommended bearing pressure. However, if foundations are placed directly onto competent medium strong Sandstone of the Rhondda Member then this safe net bearing pressure can be increased to 200kN/m^2

Where foundation depths are stepped, for instance to match changes in depths due to trees or changes in ground conditions/elevations, the steps should be designed in accordance with the requirements of the NHBC Standards.

If trees are to be removed, the roots should be grubbed out and foundations extended to below the zone of disturbance created by this activity and to below any remaining root hairs. In addition, deepening of foundations in accordance with NHBC Standards will be required where strip or trench fill foundations are within the zone of influence of existing, removed or proposed trees and proposed shrub planting. A tree survey should be undertaken by an arboriculturist in accordance with BS 5837:2012 to identify the type, and height of existing trees on the site and including any off-site trees, which could have an effect on foundation design.

Where foundations are within the zone of potential desiccation from trees and are deeper than 1.5m bgl, a suitable compressible material or void former will be required on the inside faces of foundations to external walls and beneath ground bearing floor slabs.

Excavation of trench fill foundations in excess of 2.5m bgl is unlikely to be economic and may be impracticable to undertake due to the variability of Made Ground. In addition, if foundations in excess of 2.5m depth are proposed, they should be designed by a Structural Engineer in

accordance with the requirements of the NHBC Standards (Chapter 4.2.8) and NHBC Technical Requirement R5. In addition, Hydrock recommends when trench fill foundations are deeper than 2.5m due to trees, the design should take into account soil desiccation risk from plot specific testing if within the influencing distance of trees.

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

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

Groundwater monitoring indicates a sporadic, low flow groundwater table. Any water that collects at the base of the foundation excavations should be removed by pumping from a sump in the base.

6.7 Roads and pavements

Based on the test results and Hydrock's experience and visual inspection of the soils on site and subject to *in situ* testing during construction, it is considered likely an equilibrium CBR of 3% will be achievable over the majority of the site when pavements or roads are placed directly onto Made Ground. Where roads or pavements are placed onto weathered bedrock or rock head a higher CBR value of 7% can be utilised.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.

Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with DMRB IAN 73/06 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

6.8 Drainage

Indicative infiltration rates from the ground investigation are presented in Appendix B and are summarised in Table 5.5.

The indicative infiltration rates suggest that the Rhondda Member is suitable for soakaways and sustainable urban drainage features. Any infiltration features will need to be founded solely in the natural strata and may require lining when partially placed in any Made Ground if it remains in-situ.

Further targeted infiltration testing may be required to supported detailed drainage design and a SAB compliant submission, consultation with the drainage engineer should be made prior to instructing additional infiltration testing.

6.9 Buried concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005) and the information presented in Section 5.5.6 (Table 5.11), the shallow soils (Made Ground) can be classified as Design Sulfate Class DS-1 and ACEC Class AC-1.

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

7. Geo-environmental assessment

7.1 Updated conceptual model

7.1.1 Updated ground model

The initial CSM developed from the desk study and field reconnaissance survey has been updated using the findings of the ground investigation and is presented in Section 5. The updated CSM is the basis for the geo-environmental assessment presented in this section.

7.1.2 Updated exposure model

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

7.1.2.1 Sources

The following potential sources have been removed from the exposure model:

- PCBs and oils from transformers in the electricity sub-stations on site (S02).
- Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03).

The following potential sources have been modified for the exposure model:

- Made Ground, associated with historical construction activities and imported fill including elevated concentrations of PAH (S01).
- Asbestos associated with the boiler house in the north of the site (S05).
- Asbestos Containing Materials associated with gaskets on former pipe work of the district heat network (S07).

The following potential sources have been added to the exposure model:

- Petroleum hydrocarbons and VOC/SVOC in groundwater below the site (S09).

7.1.2.2 Receptors

The following potential receptor has been removed from the exposure model.

- Development end-use (buildings, utilities and landscaping) (R02)

7.1.2.3 Pathways

The following potential pathway has been removed from the exposure model.

- Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps (P02).

The following potential pathway has been added to the exposure model.

- Vapour (VOC/SVOC) release into outdoor air (P07).

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

7.2 Risk assessment approach

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

Firstly, the risks associated with the identified potential contaminant linkages have been estimated using standardised methods (typically involving comparison of site data with published 'screening

values'). Secondly, where screening values are exceeded, the result has been evaluated in an authoritative review of the findings with other pertinent information to determine whether or not the exceedance is or is not acceptable in the site-specific circumstances.

The data sets used in the assessment comprise the analytical results obtained by Hydrock as listed in Section 5.

In cases where potentially unacceptable risks are indicated and/or the land is potentially unsuitable for its intended use, actions such as more advanced stages of risk assessment (Tier 3, detailed quantitative risk assessment (DQRA)) or remediation are proposed in Section 7.9.

7.3 Human health risk assessment

7.3.1 Soils Assessment

7.3.1.1 Generic Assessment Criteria

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

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

GAC are selected based on the following hierarchy:

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

The results of the assessment are presented in Appendix E

7.3.1.2 Data sets

The data set(s) used in this report is based on the conceptual site model and the proposed development. Hydrock have spilt the data sets into three notable areas, General Made Ground (Site wide), Made Ground recorded beneath road ways, and Topsoil.

GAC based on a soil organic matter (SOM) of 2.5% have been adopted for all Made Ground soils based on laboratory results. This differs for Topsoil recorded in the south of the site and (SOM) of 6% has been adopted. This is shown on separate assessment sheets are presented in Appendix E.

7.3.1.3 Assessment Results

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

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

CoPC	GAC (mg/kg)	GAC Source	No. samples	Min. (mg/kg)	Max. (mg/kg)	No. samples >GAC
General Made Ground						
Arsenic	37	Hydrock Derived	24	6.10	37	1
Benzo(b)fluoranthene	4.1	Hydrock Derived	24	0.05	4.2	1

Dibenz(ah)anthracene	0.29	Hydrock Derived	24	0.05	0.75	5
Made Ground (Roads)						
Benzo(a)anthracene	12	Hydrock Derived	2	6	93	1
Benzo(a)pyrene	5	C4SL: CL:AIRE 2014	2	8.3	97	2
Benzo(b)fluoranthene	3.3	Hydrock Derived	2	11	130	2
Chrysene	22	Hydrock Derived	2	6.8	100	1
Dibenz(ah)anthracene	0.29	Hydrock Derived	2	0.05	14	1
Indeno(123cd)pyrene	36	Hydrock Derived	2	5.2	38	1

The individual analytical results have been compared with the relevant GAC in the summary table in Appendix E. The presence of arsenic benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(ah)anthracene, and Indeno(123cd)pyrene in Made Ground, requires further consideration.

The phrase 'further assessment required' is used to denote soil concentrations that exceed a GAC. This does not necessarily mean that the soil is 'contaminated' or not otherwise suitable for use. The assessment and any mitigation required are to ensure the site does not pose an 'unacceptable risk' as defined under Planning and Part 2A of EPA 1990.

7.3.2 Asbestos

Asbestos Containing Materials (ACM) were suspected to underlie the northern (housing estate) area pf the site, associated with lagging and insulation of the redundant district heating network. Samples of lagging and gaskets along the pipes of the heating network were taken from below manhole covers (MH) spread across the site, the locations of which are summarised in Table 7.2.

Table 7.2: Visual evidence of Asbestos Containing Materials

Location	Comment	Results of laboratory testing
MH01	Insulation to pipe.	No asbestos detected.
MH01	Insulation to pipe.	No asbestos detected.
MH02	Possible asbestos pipe lagging.	No asbestos detected.
MH02	Possible asbestos pipe lagging.	No asbestos detected.
MH02	Insulation to orthogonal pipe.	No asbestos detected.
MH02	Loose gasket.	Asbestos detected – chrysotile.
MH03	Insulation to pipe.	No asbestos detected.
MH03	Insulation to pipe.	No asbestos detected.
MH03	Insulation to orthogonal pipe.	No asbestos detected.
MH04	Insulation to pipe.	No asbestos detected.

Location	Comment	Results of laboratory testing
MH04	Insulation to pipe.	No asbestos detected.
MH05	Insulation to pipe.	No asbestos detected.
MH05	Insulation to orthogonal pipe.	No asbestos detected.
MH05	Insulating board debris.	No asbestos detected.
MH06	Insulation to pipe.	No asbestos detected.
MH06	Insulation to pipe.	No asbestos detected.
MH07	Insulation to pipe.	No asbestos detected.
MH07	Insulation to pipe.	No asbestos detected.
MH08	Insulation to pipe.	No asbestos detected.
MH08	Insulation to pipe.	No asbestos detected.

Of the 33 soil samples analysed for asbestos across the site, none returned a positive asbestos ID. Note that the location of MH04 was not recorded by GEL during the ground investigation, and thus it is absent from the exploratory hole location plan.

7.3.3 *Risk evaluation*

The screening exercise has identified:

- Arsenic, benzo(b)fluoranthene, and dibenz(ah)anthracene, within the general Made Ground; and
- benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(ah)anthracene, and indeno(123cd)pyrene within the Made Ground beneath roads.

These are considered further here to assess if the exceedance may be acceptable with respect to the proposed development. The phrase 'further assessment' does not necessarily mean that the soil is 'contaminated' or not fit for use.

7.3.3.1 *General Made Ground*

One sample in BH302B recorded an arsenic occurrence of 37mg/kg which is at the GAC (37mg/kg) for residential with plant uptake. However, on statistical review the upper confidence level of the mean is below the GAC and no further consideration is required for arsenic.

There is 1 exceedance of benzo(b)fluoranthene of 4.2mg/kg compared to the GAC of 4.1mg/kg. This is considered a marginal exceedance of the GAC, and similar to arsenic the upper confidence level of the mean is below the GAC and no further consideration is required for benzo(b)fluoranthene.

There are 5 exceedances of dibenz(ah)anthracene ranging from 0.31mg/kg to 0.75mg/kg in comparison to the GAC of 0.29mg/kg. The 99th upper confidence limit is (0.31mg/kg) and only marginally in exceedance of the GAC (0.29mg/kg), Therefore, this can be considered a minor exceedance of the GAC and no further consideration is required for dibenz(ah)anthracene

7.3.3.2 *Made Ground beneath roadways*

The exceedances recorded within the Made Ground beneath the road are as follows:

- benz(a)anthracene (93mg/kg vs GAC of 12mg/kg),
- benzo(a)pyrene, (97mg/kg vs GAC of 5mg/kg),
- benzo(b)fluoranthene, (130mg/kg vs GAC of 3.3mg/kg),
- chrysene, (100mg/kg vs GAC of 22mg/kg),
- dibenz(ah)anthracene, (14mg/kg vs GAC of 0.29mg/kg),
- indeno(123cd)pyrene (38mg/kg vs GAC of 36mg/kg),

It is considered that at this early stage this is an unacceptable risk. However, due to the limited locations that were possible to complete in the roadways and the small size of the data set and additional sampling and testing of this stratum is recommended to understand the exceedances better.

7.3.3.3 Asbestos

Asbestos Containing Materials were only identified in manhole MH02, and comprised a fragment of loose chrysotile gasket along the length of an exposed pipe which forms part of the redundant district heating network. No fibres of asbestos were detected in any of the Made Ground samples analysed across the site.

Hydrock consider asbestos to be localised in association with the district heating network, and therefore does not foresee widespread asbestos fibres to be characteristic of any Made Ground on the site. However, sporadic fly tipping of asbestos cement board is still present in small areas of the site, which could pose a risk to the end user.

Overall, the risk associated with the identified presence of asbestos is considered to be low, however, mitigation will be required to ensure risks to site users remains negligible. It should be noted that this aspect of assessment does not account for any asbestos within existing above ground structures, which includes houses and the boiler house in the north of the site.

7.4 Phytotoxicity risk assessment

7.4.1 Risk estimation

Priority phytotoxic chemical concentrations have been screened against published values to determine the likely risk to plant growth (phytotoxic GAC). Phytotoxic GAC based on a pH of >7% have been adopted for all soils based on laboratory results.

As with human health, individual sample test results are compared directly with the phytotoxic GAC.

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

7.4.2 Risk evaluation

Detriment to plant life is difficult to quantify and many of the GAC are based on agricultural crop yields rather than harm to particular plant species.

Hydrock does not believe there to be an unacceptable risk to plant life from contamination and no any additional consideration is required with regard to risks to plant life.

7.5 Pollution of controlled waters risk assessment

7.5.1 Risk estimation

The risks to groundwater and surface water from contaminants on site have been assessed in accordance with the Environment Agency (2006) Remedial Targets Methodology (RTM).

Site contaminant loadings are compared with relevant screening values (Water Quality Targets (WQTs), which are linked to the CSM.

Acceptable WQT are defined for protection of human health (based on Drinking Water Standards (DWS)) and for protection of aquatic ecosystems (Environmental Quality Standards (EQS)).

As related specifically to this site, the data are compared with criteria selected in accordance with the methodology presented in Appendix E. This methodology involves selecting which of several alternative risk scenarios apply in this case. The assessment is presented in Table 7.3 below, with the justification for the scenarios selected explained in the following text:

The Secondary A Aquifer of the Rhondda Member was not encountered in any exploratory hole location. Perched groundwater was only found to be present within the Made Ground in TP214 2.50m bgl A deeper groundwater body is anticipated to be present in the Rhondda Member beyond 10mbgl, in keeping with the water levels of the Afon Rhondda Fach and River Rhondda, and is thought to be flowing north to south, under the influence of topography. Transmission of identified CoPCs is likely to occur laterally between the strata, but expected to be significantly impeded by the hardstanding across the site, which will inhibit infiltration of surface water, and in turn lateral migration of contaminants.

Table 7.3: Summary of water quality risk assessment protocol

Hydrock scenario	Water body receptors	Secondary receptors	Example contaminant linkages	RTM level and data used	Water quality targets
B	Groundwater	Surface water – Afon Rhondda Fach and River Rhondda.	Contaminants from site leach or seep into a groundwater body that feeds inland surface water by base flow. The surface water may be an aquatic ecosystem.	RTM Level 1	EQS (inland)

Notes:

Some EQS are water hardness dependent. This is measured either in the receiving surface water or in groundwater (if it is part of the pathway), or is estimated from national maps.

Inland waters EQS applicable to freshwater, 'other' waters EQS applicable to coastal or transitional waters.

This table and the results of the assessment are considered as a first screening for potential risks of pollution of Controlled Waters. More specific requirements may be stipulated by the relevant Agency.

The results of the screening assessment are presented in Appendix E and are summarised in Table 7.4.

In some instances, the reporting limit (or detection limit) quoted by the laboratory may be greater than the WQT that it is being assessed against. As the current exercise is an initial screening assessment, further assessment of these elements has not been undertaken.

Table 7.4: CoPC which require further assessment (controlled waters)

CoPC	WQT (µg/l)	Basis for WQT	No. samples	No. samples above LoD	Min. (µg/l)	Max. (µg/l)	No. samples exceeding WQT and above LoD
Soil Leachate Data							
Copper	1	EQS (inland)	12	12	1.3	36.0	12
Lead	1.2	EQS (inland)	12	4	<1.0	2.5	3
Vanadium	20	EQS (inland)	12	4	<1.7	57	1
Fluoranthene	0.00017	EQS (inland)	12	1	<0.01	0.23	1

Note: the maximum recorded value is compared with the water quality target.

7.5.2 Risk evaluation

The EQS inland WQT for copper, lead vanadium and fluoranthene have been exceeded. However, the risk to groundwater is considered to be very low, due to the distance between contaminants and a deep groundwater body, (which was not identified during fieldwork investigation) which prevents transmission and leaching of contaminants.

Furthermore, the inland waters EQSs for copper, and lead are based on the bioavailable fraction and because bioavailability has not been calculated for these metals the assessment is conservative as it assumes 100% bioavailability.

Therefore, whilst there are concentrations of Chemicals of Potential Concern elevated above the water quality criteria in leachates, based on the remediation and investigation works undertaken to date and subject to agreement with Natural Resources Wales, Hydrock does not believe the majority of the site poses a significant risk to Controlled Waters, and no further remediation is required.

There is continued monitoring and sampling of groundwater samples from BH307 in the far south of the site and this will be assessed within a separate technical note once complete.

7.6 Ground gases risk assessment

7.6.1 Data

GEL (on behalf of the client and instructed by Hydrock) have undertaken the 6 readings required, including periods of falling atmospheric pressure. The conclusions of the ground gas risk assessment (excluding the ongoing monitoring at BH307) are presented below.

7.6.2 Assessment

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

The assessment guidelines set out in Table 2 of BS 8485 are based on interpretation of the gas concentrations and the gas flow rates. The quantitative assessment has been carried out by comparing the individual gas concentrations and gas screening values (GSV[1]) in Appendix D with

[1] Note: GSV is synonymous with 'site characteristic hazardous gas flow rate' (Q_{hgs}) of BS 8485:2015 +A1:2019 Table.

the published CS thresholds (BS 8485 Table 2), in addition to a worst-case GSV assessment in accordance with section 6.3.7 of BS 8485. The assessment is summarised in Table 7.5 and the full assessment is presented in Appendix D.

Table 7.5: Ground gas risk assessment

	Min	Max	Typical [i]	Comment
Carbon Monoxide (ppm)	0	25	0	Carbon monoxide has only been noted in two positions, on one occasion each.
Carbon Dioxide GSV (l/hr)	0	0.0074	0.002	CS1
Methane GSV (l/hr)	0	0	0	CS1
Plausible worst-case check		0.0222	-	CS1
For the purposes of the calculation, where the recorded gas flow rate is below the manufacturer's limit of detection for the instrument used, the detection limit has been adopted for the gas flow rate.				

As indicated in Table 7.5, the computed GSV for carbon dioxide and methane indicates CS1 conditions and methane and carbon dioxide at concentrations are 'typically' below 1% and 5% respectively. As such, the site is classified as Characteristic Situation 1.

A maximum concentration of 25ppm of Carbon Monoxide has been recorded. Health and Safety Executive guidance indicates that the long term exposure limit to carbon monoxide should not exceed 20ppm, and thus this recorded concentration may pose risks to the end user. As such, further gas monitoring for Carbon Monoxide is recommended.

Elevated concentrations of VOC have also been recorded in BH307 in the south of the site in the range of 99.2 - 108.6 ppm. The elevated carbon monoxide record of 25ppm also relates to this same borehole. As this is the only borehole which has recorded groundwater, it is possible that this contamination is derived from the water table, as there is a lack of Made Ground in this area. Further works have been agreed which will make assessment of the vapour risk to the development in a separate technical note.
Following the conclusion of the monitoring and update of the technical note, the characteristic situation may be upgraded to reflect these findings. As such the CS1 classification is considered preliminary.

7.7 Construction materials risk assessment

7.7.1 Water pipelines

A formal water pipe investigation and risk assessment is beyond the scope of this report. However, the findings of this investigation have been compared to the threshold values in Water UK HBF (2014), Table 1 as far as is practicable.

The site is brownfield and organic contamination (PAH) has been identified in exceedance of the threshold values and Hydrock believes barrier pipe is required. However, confirmation should be sought from the water supply company at the earliest opportunity.

7.7.2 Other construction materials

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

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

The implications for buried concrete are discussed in Section 6.9.

7.8 Findings of the generic contamination risk assessments

The potential sources, pathways and receptors identified in the desk study) have been investigated and assessed (Sections 7.2 to 7.7). A Source-Pathway-Receptor linkage assessment has been undertaken and is presented in Appendix H (Table H.2).

The final CSM will be provided on final issue of the report.

A summary of the Source-Pathway-Receptor (SPR) contaminant linkages for which the risks may be unacceptable and require mitigation (those that are moderate or higher) are discussed in Table 7.6.

Table 7.6: Residual risks following risk evaluation

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 1.	Made Ground beneath road with exceedances of PAHs.	Ingestion, inhalation or direct contact.	Human health.	Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(ah)anthracene, and Indeno(123cd)pyrene were recorded as exceeded. It is suggested at this time pending any further sampling that any Made Ground from beneath roads is not re-used in areas of soft landscaping such as gardens or public open spaces.	
PL 2.	Fly Tipped wastes including metals metalloids asbestos and asbestos containing materials	Ingestion, inhalation or direct contact.	Human health.	Fly tipped waste was noted during the desk study walkovers, and with new fly tipping on going during the site investigation. The removal of this waste should be undertaken, and additional testing of the soils in these local areas to confirm no residual contamination.	
PL 3.	Asbestos within existing buildings and boiler houses.	Ingestion, inhalation or direct contact.	Human health.	Asbestos surveys of the existing housing stock and the boiler house should be complete prior to demolition. If asbestos is recorded this should be stripped ahead of demolition by a licensed contractor and disposed of at a suitable licensed facility.	
PL 4.	Asbestos gaskets within district heating network	Ingestion, inhalation or direct contact.	Human health.	Only a gasket within the heating network was recorded as asbestos. Hand picking of gaskets should be allowed for by a suitable qualified asbestos surveyor during removal of the heating network.	

Contaminant Linkage				Comments	
Pollutant Linkage	Sources	Pathways	Receptors	General	Mitigation
PL 5.	Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons	Ingestion, inhalation or direct contact.	Human health	Bonfire remnants were noted during the walkover, and bonfires were on going during the site investigation. The removal of this waste should be undertaken, and additional testing of the soils in these local areas to confirm no residual contamination.	
PL 6.	TPH and VOC/SVOC in groundwater within monitoring wells.	Inhalation.	Human health.	Elevated VOCs have been recorded on 3 occasions in BH307, where no Made Ground is present. This is the only borehole which has recorded groundwater during the monitoring cycles, and the only borehole with elevated VOC concentrations. As such, it is assumed that contaminated groundwater is the sources of VOC and SVOC, but this should be confirmed by the on-going groundwater sampling and gas monitoring.	

7.9 Mitigation measures

The outline remediation strategy presented below is provided for guidance only, and does not represent a 'Remediation Options Appraisal', or a 'Remediation Strategy', prepared in accordance with LCRM (2021).

Once a development layout is available it would be worth reviewing to assess whether further sampling, testing and assessment could be carried out to zone the site for its specific uses more accurately. This may lead to less mitigation being required in less sensitive end use scenarios such as public open space. This is a preliminary assessment and therefore is for initial guidance only.

As shown in Table 7.6 (and subject to regulatory (and NHBC) agreement), Hydrock consider the following mitigation is required to ensure the site is suitable for use for the proposed end use. The mitigation measures include:

- Due to the exceedances recorded beneath road ways these soils should not be placed at surface within areas of soft landscaping. If these soils end up in areas of soft landscape due to changes in the master-planning then allowance should be made for the installation of a 600mm cover system in gardens comprising a subsoil beneath a topsoil thickness of between 150mm and 300mm. However, in the first instance additional sampling of these materials is suggest to better understand the distribution across the site. (PL1)
- Removal of fly tipped waste and bonfire remnants and additional testing to confirm no residual contamination (PL2 and PL5)
- Asbestos Survey of existing housing and Boiler House (PL3)
- Hand Picking of asbestos gaskets during the removal of the heating network (PL4)

- Gas and groundwater sampling/screening for TPH and SVOC/VOC is on-going in the southern part of the site. There is the potential requirement for the installation of a vapour protection membrane if buildings are to be constructed in this area of the site (at present buildings are not proposed). (PL6)

The methodology for the remediation should be set out in a Remediation Strategy (which will include the 'Implementation Plan', and 'Verification Plan' will need to be submitted to the warranty provider and the regulatory authorities for approval.

In addition, the production of a Materials Management Plan and its approval by a Qualified Person will be required to allow reuse of suitable material at the site in accordance with waste regulations.

Verification reports by a competent independent geo-environmental specialist will be required following completion of any remedial works (including radon membrane and ground gas membrane installation).

8. Waste and materials management

8.1 Introduction

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

Section 8.2 below describes the key issues relating to off-site disposal to landfill and Section 8.3 considers requirements relating to reuse of soils and materials management.

8.2 Waste disposal

8.2.1 Principles

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

Classification is a staged process:

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

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

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

Further discussion with regards to the characterisation process for different scenarios and waste types is provided below.

Topsoil and Peat

Topsoil and peat are biodegradable, therefore if they are surplus to requirements and cannot be re-used in accordance with a Materials Management Plan, they cannot be classified as inert. As such, topsoil and peat need to be classified by a staged assessment and sampling process and would either be classified as hazardous or non-hazardous, depending upon the results of the assessment.

Contaminated or potentially contaminated sites

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

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

However, if soils are potentially able to be disposed to an inert landfill as non-hazardous waste, or require testing to determine if they can be disposed of to a stable non-reactive hazardous or hazardous class of landfill, the next stage of assessment is to undertake qualitative WAC testing. This will determine the Basic Characterisation and the landfill category at which the soils can be accepted.

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

8.2.2 HazWasteOnline™ assessment

As the site is brownfield, in order to inform the preliminary waste characterisation process, Hydrock has undertaken an exercise using the proprietary web-based tool HazWasteOnline™. The output of the HazWasteOnline™ assessment is provided in Appendix F and a summary of the preliminary waste classification is provided below in Section 8.2.4.

8.2.3 WAC testing

The site is brownfield. However, WAC testing has not been undertaken to date but will be required on the excavated soils that are to be disposed of, to assist with waste disposal options prior to disposal. A summary of the preliminary waste disposal options is provided below in Section 9.2.4.

8.2.4 Preliminary waste disposal options

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

- The Made Ground is likely to be classified as non-hazardous waste.
- The natural un-contaminated soils are likely to be classified as non-hazardous waste. If WAC testing is undertaking at time of disposal it may be possible for this to be disposed of as inert.
- Any soils containing > 0.1% asbestos or visible asbestos containing materials would be considered as hazardous.
- It should be noted that there are three instances where high PH has caused the HazWaste to classify the Made Ground a Hazardous. In all of these instances the amount of concrete from previous developments has caused these elevations and they can therefore be discounted.

8.2.5 General waste comments

It should be noted that:

- It is the waste producer's responsibility to segregate the waste at source and waste producers must not mix waste materials/streams or dilute hazardous components, for example by mixing with less or non-hazardous waste on site to meet WAC limit values.
- The above preliminary assessment has been made on the basis of the soils tested as part of the ground investigation, using the HazWasteOnline™ assessment. However, the formal classification of waste can only be undertaken on the material to be disposed of, and by the waste producer and the receiving landfill as license conditions vary from landfill to landfill.
- Basic Characterisation should be undertaken in accordance with Environment Agency guidance by the waste producer. Hydrock can assist if required and this report will assist the characterisation. However, Basic Characterisation does not form part of the current commission and would require further assessment and testing on the wastes actually to be disposed.
- Once the waste producer has undertaken an initial Basic Characterisation on each waste stream, they can manage the soils as part of the on-site processing programme (for example, stockpiling, treatment, screening and separation). The waste producer and landfill operator will then need to agree the suite of compliance testing for regularly generated waste to demonstrate compliance with the initial Basic Characterisation prior to disposal.
- At the time of disposal, additional testing on the excavated soils to be disposed of, will likely be necessary.
- Non-hazardous and hazardous soils require pre-treatment (separation, sorting and screening) prior to disposal.
- The costs for disposal of non-hazardous and hazardous soils are significant compared to disposal of inert material.
- In addition to disposal costs, landfill tax will be applicable. Non-hazardous and hazardous waste will generally be subject to the Standard Rate Landfill Tax. Inert or inactive waste will generally be subject to the Lower Rate Landfill Tax. The landfill tax value changes each April and can be found at https://www.gov.uk/government/publications/rates-and-allowances-landfill-tax/landfill-tax-rates-from-1-april-2013.
- Before a waste producer can move waste to a landfill site for disposal, they need to check the landfill site has the appropriate permit and must have completed the following[2]:
  - Duty of care transfer note / Hazardous Waste consignment note, including comment as to if pre-treatment has been undertaken; and
  - Basic Characterisation of the waste, to include: description of the waste; waste code (using list of wastes); composition of the waste (by testing, if necessary) and; WAC testing (if required).

8.3 Materials management

8.3.1 Introduction

Soils that are to remain on site, should be managed and reused in accordance with a Materials Management Plan (MMP), prepared in accordance with 'The Definition of Waste: Development Industry Code of Practice', Version 2 (CL:AIRE), known as the DoWCoP. Where all aspects of the

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

DoWCoP are followed the soils are considered not to be waste, because they were never discarded in the first place.

Version 2 of the DoWCoP clearly sets out the principles and an outline of the requirements of a MMP. The following compliance criteria must be seen to apply to the MMP for the site:

- Factor 1: Protection of human health and protection of the environment.
- Factor 2: Suitability for use, without further treatment.
- Factor 3: Certainty of Use.
- Factor 4: Fixed Quantity of Material.

The reuse of soils at sites should be considered during the planning and development design process so that compliance with issues such as fixed quantity and certainty of use clearly relate to agreed site levels. Suitability of Use is normally evident from the remediation strategy or the design statement, which form an integral part of a MMP. However, some soils may need to be tested post-excavation to prove they are suitable for use.

Once the MMP is finalised, it must be declared by a Qualified Person (QP). The Declaration is an on-line submission as part of which the QP is required to confirm that the declaration is being made before the relevant works have commenced (i.e. it is not a retrospective application).

Once all material movements have been completed in accordance with the MMP a verification report must be produced, kept for 2 years and provided to the EA on request.

It should be noted that failure to comply with the requirements of the DoWCoP when re-using materials has potentially significant consequences for the waste holder. The risk is that the reused materials are still regarded as a waste that has been illegally deposited. From 1 April 2018, the scope of Landfill Tax has been extended to sites operating without the appropriate environmental disposal permit, and operators of illegal waste sites will now be liable for Landfill Tax. Further information is available at: https://www.gov.uk/government/publications/landfill-tax-disposals-not-made-at-landfill-sites/landfill-tax-disposals-not-made-at-landfill-sites.

If soils are excavated and reused on sites (or moved to another site) without a MMP, exemption, or appropriate Permit in place, anyone who knowingly facilitates the disposal may be '*jointly and severally liable*' to any assessment of tax, fines or prosecution.

8.3.2 Materials management scenarios

The materials management scenarios present on site are discussed below.

It should be noted that more than one scenario may apply, dependent upon where the soils are proposed for reuse.

8.3.2.1 Clean, naturally occurring materials – reused on the site of origin

Where soils are naturally occurring, uncontaminated and are reused on the site they are excavated (i.e. greenfield site with documented site history, with no Made Ground), they will fall outside the Waste Framework Directive (WFD) (i.e. they will not be a waste when reused on the site of origin).

However, there needs to be certainty of that reuse, and evidence is necessary to support this strategy, for example through information provided during the planning process. The onus is on the developer to demonstrate that the materials are not a waste and will never become a waste. As such, a Materials Re-use Strategy is recommended to show certainty. Alternatively, if the volume of material is under 1,000 tonnes, then a U1 waste exemption may be applied for from the Environment Agency.

It may be noted that some 'clean naturally occurring materials' may still fail the 'suitable for use' test, for example, soils with a naturally high organic content may not be suitable for use because of their propensity to produce ground gases such as methane. Rules regarding other more unusual circumstances such as where natural soils contain an unacceptably high mineral content are described in the DoWCoP.

8.3.2.2 Made Ground and other contaminated soils

On sites where Made Ground or contaminated soils are present, any soils excavated will be a waste as soon as they are excavated (even if they are clean, naturally occurring materials), unless they are subject to reuse in accordance with the DoWCoP. As such, for any brownfield site or a site where Made Ground is present and soils are being moved and reused, the materials could be deemed a waste, subject to either:

- a Materials Management Plan (MMP), to prevent the material being classified as a waste following reuse; or
- an exemption (for limited volumes); or
- an environmental permit, dependant on its status.

8.3.2.3 Geotechnical improvement requirements

Construction activities carried out on uncontaminated soils solely for the purpose of improving geotechnical properties e.g. lime / cement modification, are not generally regarded as waste treatment operations and do not require a permit.

However, should processing be needed (such as screening, treatment or improvement), that would constitute a waste activity and require a mobile treatment permit. This may be as simple as removing oversize material with an excavator bucket, to using a riddle bucket to remove hardcore to full mechanical screening.

9. Uncertainties and limitations

9.1 Site-specific comments

The investigation undertaken to date has not included the houses which occupy the northern zone of the site, and there is potential that these may contain asbestos; the same is true of the boiler house in the north-west of the site. Additionally, soils have not been assessed or sampled below the sites of the bonfires as additional bonfires were being lit in the housing estate during the ground Investigation. Thus, these cannot be removed from the final CSM at this stage of investigation.

9.2 General comments

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

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

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

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

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

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

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

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

The chemical analyses reported were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional

analysis will be required at the time of disposal to fully classify waste. Discussion and comment with regards to waste classification are preliminary and do not form the requirements of 'Basic Characterisation' as required.

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

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

The non-specialist UXO screening has been undertaken for the purposes of ground investigation only (i.e. low risk activity in accordance with CIRIA Report C681). Further assessment should be undertaken with regards to other higher risk activities e.g. construction.

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

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

10. Recommendations for further work

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

- demolition asbestos survey;
- additional ground investigation is recommended once the development layout is fully understood.
- discussion with specialists with regard to invasive species including Himalayan Balsam and Japanese Knotweed;
- completion of the gas monitoring and groundwater sampling at BH307 to investigate the presence of petroleum hydrocarbons and SVOC/VOCs;
- discussion and agreement with utility providers regarding the materials suitable for pipework;
- discussions with regulatory bodies and the warranty provider regarding the conclusions of this report;
- Compilation of Remediation Strategy and Verification plan
- Compilation of material management plan
- Compilation of Geotechnical Design Report to include foundations (where deeper than 2.5m), earthworks, and retaining wall design.
- turn over method specification for dealing with obstructions across the site.
- remediation and mitigation works; and
- verification of the earthworks, remediation and mitigation works.

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Appendix A Drawings

the urbanists
planning & design

Client	Trivallis
Project	Penrhys
Title	Framework Masterplan

Project ID	Organiser	Role	Block	Level	Type	Series	Dwg	Rev.	Status
2238	URB	UD	XX	XX	UD	90	001	D	Final

Drawn JD Date 14/06/2024 Checked JB Scale 1:2,5000 @A1

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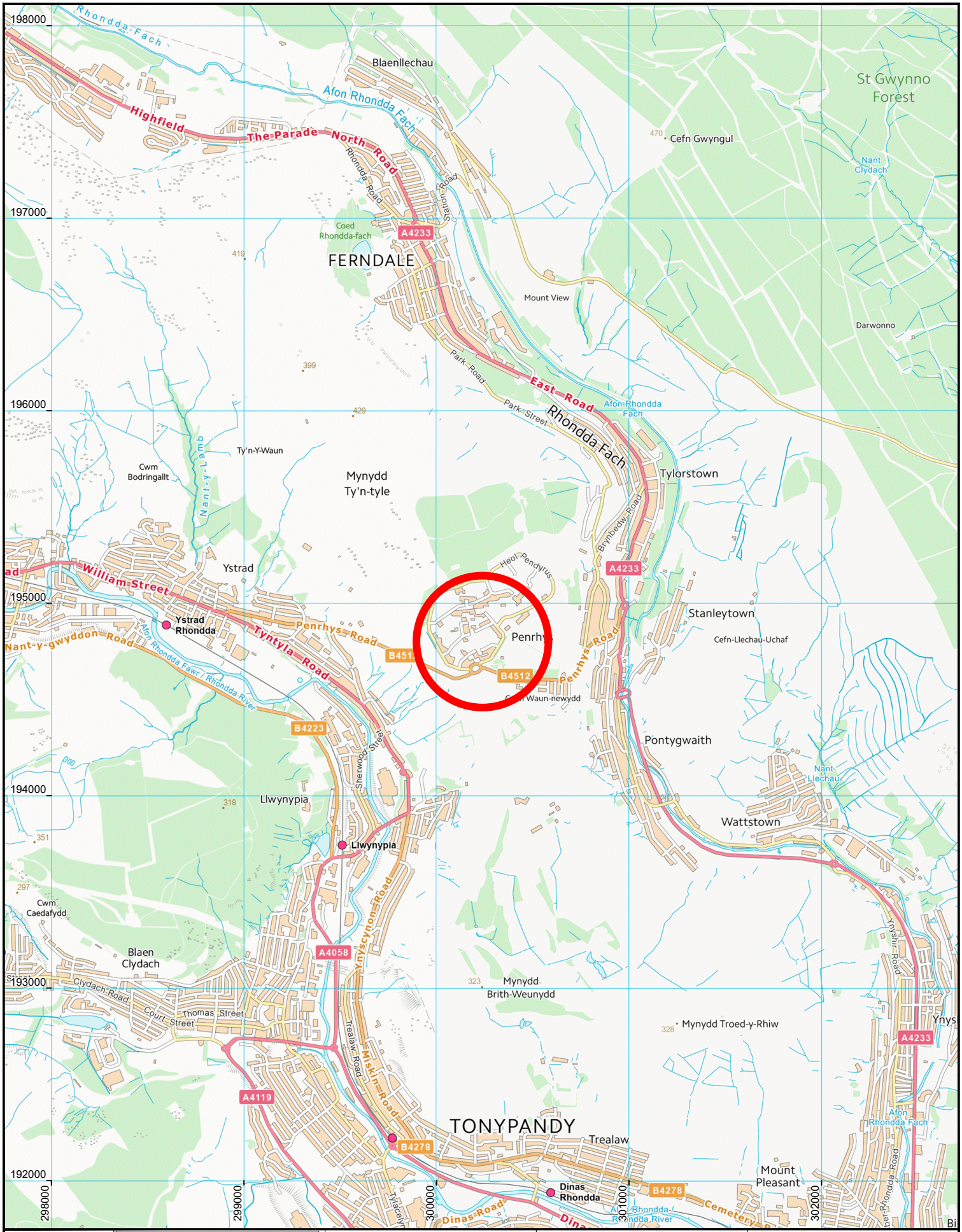

OS NORTH

Site Ref: ST09

0 500 Metres

REV.	FIRST ISSUE					
P1	EP	12/07/24	EW	12/07/24	AE	17/07/24
	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE

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CLIENT: TRIVALLIS

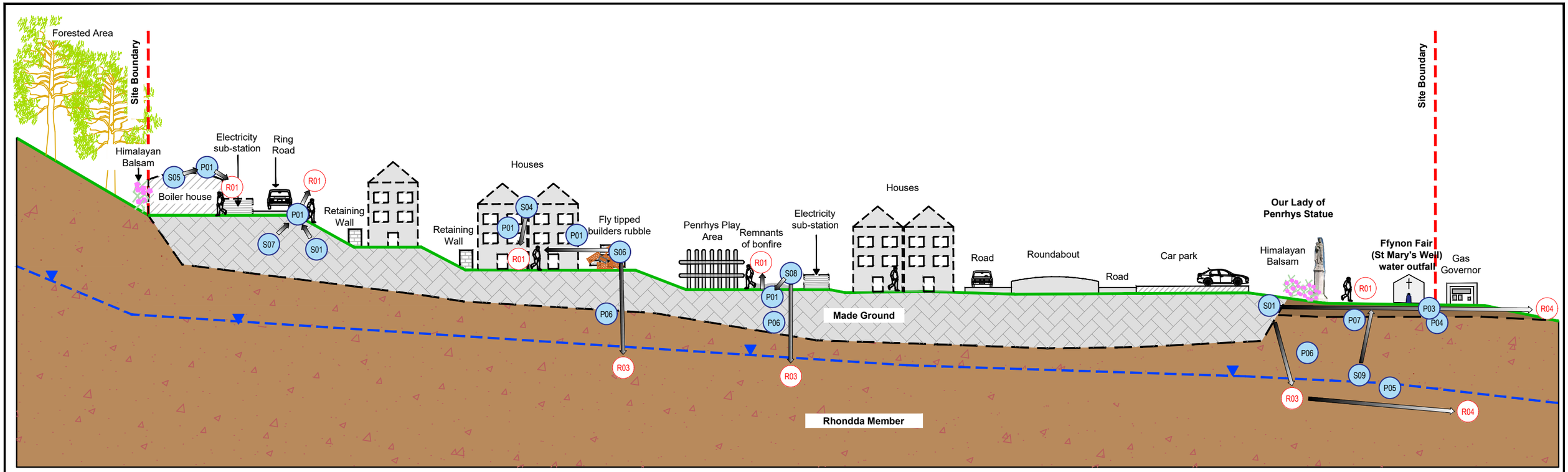
PROJECT: PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE: SITE LOCATION PLAN

HYDROCK PROJECT NO.	SCALE @ A4
C-30603	1:25,000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
30603-HYD-XX-XX-DR-GE-1004	P1



Potential on-site sources of contamination

S01. Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of PAH.

~~S02. PCBs and oils from transformers in the electricity sub-stations on site.~~

~~S03. Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.~~

S04. Asbestos within existing buildings / structures.

S05. Asbestos associated with the boiler house in the north of the site.

S06. Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials.

S07. Asbestos Containing Materials associated with gaskets on former pipe work of the district heat network.

S08. Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons.

S09. Petroleum Hydrocarbons and VOC/SVOC in groundwater below the site.

Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

Potential receptors

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

R01. People (neighbours, site end users).

~~R02. Development end use (buildings, utilities and landscaping).~~

R03. Groundwater: Secondary A aquifer status of the Rhondda Member.

R04. Surface water bodies: River Rhondda and the Afon Rhondda Fach.

Potential pathways

The following potential pathways have been identified.

P01. Ingestion, skin contact, inhalation of dust and outdoor air by people.

~~P02. Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps.~~

P03. Surface water via overland flow.

P04. Surface water, via drainage discharge.

P05. Surface water via base flow from groundwater.

P06. Migration of contaminant via leachate migration through the unsaturated zone into the Rhondda Member.

P07. Inhalation of VOC/SVOC and petroleum hydrocarbon vapours outdoors.

KEY

- Existing ground profile
- Conjectural geological boundary
- Groundwater elevation
- Made Ground
- Topsoil
- Rhondda Member

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

REV.	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P01	FIRST ISSUE	EP	08/08/24	EW	14/08/24	AE	21/08/24

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CLIENT: TRIVALLIS

PROJECT: PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE: FINAL CONCEPTUAL SITE MODEL

HYDROCK PROJECT NO.: C-30603

SCALE @ A3: NTS

PURPOSE OF ISSUE: SUITABLE FOR INFORMATION

STATUS: S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER): 30603-HYD-XX-XX-DR-GE-1016

REVISION: P01

Appendix B Geotechnical Engineering Factual Ground Investigations Report

PENRHYS VILLAGE, RHONDDA CYNON TAFF

FACTUAL GROUND INVESTIGATION REPORT

Prepared for TRIVALLIS

Report Ref: 38113

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PENRHYS VILLAGE, RHONDDA CYNON TAFF

FACTUAL GROUND INVESTIGATION REPORT

Prepared for TRIVALLIS

Report Ref: 38113

PROJECT: Residential redevelopment

CONSULTANT: Hydrock Consultants Limited

VOLUME - VERSION	STATUS	ORIGINATOR	CHECKER	APPROVED	DATE
1 of 1 – A	INTERIM	SP	JH	-	07/06/2024
1 of 1 – B	DRAFT	SP	EB	-	10/07/2024
1 of 1 – C	FINAL	SP	JH	JH	31/07/2024

ORIGINATOR	APPROVER
S PHELPSTEAD Senior Engineering Geologist	J HANSON Director

The report is not to be used for contractual or engineering purposes unless this sheet is signed and the report designated “Final”.
The report has been prepared for the sole use and reliance by Trivallis. GEL accepts no liability as a result of the use or reliance of this report by any other parties.

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2. SITE LOCATION AND GEOLOGY 1

3. GROUND INVESTIGATION 2

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3.2 Logging 5

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EXPLORATORY HOLE LOCATION PLAN 1

APPENDICES

APPENDIX A FIELDWORK DATA

APPENDIX B MONITORING DATA

APPENDIX C LABORATORY TESTING

APPENDIX D CHEMICAL ANALYSES

1. INTRODUCTION

It is proposed to redevelop Penrhys Village, comprising around seven-hundred new homes with recreational and sports facilities, allotments, new primary school and renewable energy infrastructure. Geotechnical Engineering Limited (GEL) was instructed by Hydrock Consultants Limited (the Consultant) acting on behalf of Trivallis (the Client) to carry out an investigation to determine the ground conditions.

The scope of works and terms and conditions of appointment were specified by the Consultant and GEL correspondence reference T34877 dated 4th December 2023. The investigation was carried out under the direction and part-time supervision of the Consultant.

This report describes the investigation and presents the findings.

2. SITE LOCATION AND GEOLOGY

The site is located at Penrhys Village, Rhondda Cynon Taff and may be located by its National Grid co-ordinates ST 003 949.

British Geological Survey (BGS) England and Wales (Sheet No. 248, Pontypridd 1:50,000 1975) and the BGS online geology (1:50,000) indicate the site is underlain by the Rhondda Member, part of the Pennant Sandstone Formation. No superficial deposits are shown over most of the site, with a small area of peat mapped in the far north of the site and a small band of Glacial Till in the southeast of the site. Landslide deposits are shown on the eastern boundary of the site. Made Ground is anticipated across the site associated with the historic and existing land use.

3. GROUND INVESTIGATION

3.1 Fieldwork

The fieldwork was carried out in general accordance with BS5930:2015+A1:2020 during the period 15th April to 10th May 2024 and comprised seven boreholes, twenty-six trial pits, five soakaway tests, seventeen Dynamic Cone Penetrometer (DCP) tests and four inspection pits (attempted boreholes).

The exploratory hole locations were selected by the Consultant and set out by this Company and are shown on Figure 1. The ground level and co-ordinates at each exploratory hole (except TP207A) were established by this Company using GPS techniques.

The boreholes, referenced BH301, BH302B, BH303B, BH304, BH305, BH306 and BH307 (Appendix A), were formed using a track-mounted Geotechnical Pioneer Rig. Initially, an inspection pit was hand excavated at each borehole location to a maximum depth of 1.20m to check for buried services. Surface hardstanding in BH306 was rotary core drilled (300mm diam). Attempted boreholes BH302 and BH302A were terminated in the inspection pit at 0.75m and BH303 and BH303A at 0.30m due to hard strata. Disturbed samples were taken and retained in a combination of plastic tubs, bags and glass jars from within the inspection pits. Heavy duty dynamic sampling techniques were employed in boreholes BH301, BH302B, BH303B, BH304 and BH305 to produce a continuous disturbed sample of 112mm nominal diameter. The samples were recovered in semi-rigid plastic liner.

On refusal to dynamic sampling and from the base of the inspection pit in BH306 and BH307, the boreholes were continued by rotary core drilling techniques utilising a water or polymer flush. A double-tube swivel core barrel with semi-rigid plastic liner was utilised to recover a continuous sample of 120mm diameter (reducing to 90mm diameter in BH304).

The dynamic samples and rotary core were extracted horizontally from the sampler and core barrel respectively, the semi-rigid liner was cut to length and sealed at each end to retain moisture content. All samples and core were retained in sequence in labelled, wooden coreboxes.

Standard penetration tests (SPT) were carried out in general accordance with BS EN ISO 22476-3:2005+A1:2011. A split barrel or a solid cone was used depending upon the materials encountered and the split barrel samples retained in airtight jars. The SPT N value was taken as the number of blows to penetrate the 300mm test drive following a 150mm seating drive. Where low penetration was recorded the seating drive was terminated at 25 blows and the test drive completed after a further 50 blows. Detailed SPT results, together with the energy ratio (E_r), are presented in Appendix A and summarised as uncorrected N values on the borehole logs.

Boreholes were monitored for groundwater ingress as dynamic sampling proceeded. Water levels were also recorded at the start and finish of each day's work and on completion of the borehole and are presented on the relevant log.

On completion, gas and water monitoring standpipes were installed in each borehole. Each installation consisted of a 50mm ID HDPE slotted tube set in a filter response zone of non-calcareous pea gravel. The installation was sealed above (and below where necessary) with a bentonite plug and accessed via a valve assembly. The installations were protected at the surface by a lockable stopcock cover set in concrete. Installation details are given on the relevant borehole log.

The abandoned boreholes terminated within the inspection pit were backfilled with arisings.

The trial pits, referenced TP101, TP102 and TP107 (Appendix A), were formed by a tracked excavator with a 0.90m bucket, TP106 was hand excavated. These trial pits were excavated in the roadway to expose and sample possible asbestos lagged pipework from the historic heating network.

The trial pits, referenced TP201 to TP206, TP206A, TP207, TP207A and TP208 to TP220 (Appendix A), were formed by a tracked excavator with a 0.90m bucket or wheeled excavator with a 0.90m wide backactor bucket.

The ground surface at TP101, TP102, TP107 and TP203 consisted of hardstanding which was cut out by floor saw prior to excavation.

Representative disturbed samples were taken and retained in sealed plastic bags, tubs and glass jars. SOCOTEC were engaged by this Company to undertake air monitoring and sampling of potential asbestos containing material in trial pits TP101, TP102, TP106 and TP107. Samples for asbestos analysis were also taken from material surrounding the historic heating network within manhole covers MH01 to MH08. The results are presented in Appendix D.

Soakaway tests were carried out in trial pits TP201, TP204, TP212, TP216 and TP219 in general accordance with BRE DG 365 (2016). The excavation sides were squared as far as practicable, using the excavator bucket and the dimensions recorded within the test section. The trial pit was partially filled with clean water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The test was repeated 3 times where possible. The results are presented in Appendix A.

Photographs of the trial pit profile and spoil heap were taken and are presented separately as .jpg files.

On completion all trial pits were backfilled with arisings compacted in suitable layers by the excavator bucket. The ground surface was left slightly proud to accommodate the future inevitable settlement of the backfill. Where the trial pit was located in hardstanding, the surface was reinstated with concrete or tarmacadam.

Dynamic Cone Penetrometer tests (DCP), referenced DCP201, DCP202, DCP204 to DCP208, DCP210 to DCP214 and DCP216 to DCP220 (Appendix A), were carried out adjacent to the corresponding numbered trial pit using a CNS Farnell A2465 dynamic cone penetrometer. Probe depths were measured with respect to ground level and the number of blows for the penetration of the probe was recorded. Equivalent CBR values have been calculated and presented with the results in Appendix A.

Samples for chemical analyses were dispatched daily from site directly to i2 Analytical Ltd under a Chain of Custody. The remaining samples were brought to this Company's laboratory for testing and storage.

3.2 Logging

The logging of soils and rocks was carried out by an Engineering Geologist in general accordance with BS5930:2015+A1:2020. A key to the exploratory hole logs is presented in Appendix A.

Detailed descriptions of the core and samples are given in the borehole logs, Appendix A, along with details of sampling, in situ testing, groundwater ingress, installations and relevant comments on drilling techniques.

Suitable core subsamples were selected by GEL during logging. The core was carefully logged and prepared prior to preserving the subsample by wrapping in clingfilm and tinfoil, coating

with at least three layers of wax. The sample was further protected by a covering of waxed cheesecloth and labelled. Disturbed tub samples were also taken at regular intervals.

Prior to logging, photographs of the core were taken and are presented separately as .jpg files.

The trial pits were logged from the surface. Detailed descriptions are given in the trial pit logs, Appendix A, along with details of sampling and in situ testing, groundwater ingress and relevant comments on stability and excavatability.

3.3 Monitoring

The installations were monitored for gas flow and then tested for methane, carbon dioxide, oxygen, hydrogen sulphide, and carbon monoxide using a Gas Data GFM 435 gas analyser. The installations were further monitored for Volatile Organic Compounds (VOC's) using a MiniRAE Lite with a 10.6eV gas discharge lamp. The detector uses an ultra violet light source to break down the chemicals into positive and negative ions (ionisation). The detector measures the charge of the ionised gas and converts the signal into current. The current is then amplified and displayed as "ppm"; after measurement the ions reform the original gas or vapour allowing it to be sampled. Subsequent readings, along with water level records, are tabulated in Appendix B.

3.4 Laboratory Testing

Schedules of laboratory tests were prepared by the Consultant; the results are presented to Appendix C.

The natural water content was determined on five selected samples in accordance with BS EN ISO 17892-1:2014.

Liquid limit and plastic limit tests were carried out on five selected samples in accordance with BS EN ISO 17892-12:2018:5.3 & 5.5. An Atterberg line plot has also been presented.

Particle size distributions were determined in accordance with BS EN ISO 17892-4:2016 for thirty-six samples by wet sieving [5.2]. The fine fraction of one of these samples was further analysed by sedimentation using the pipette method [5.4]. The results are presented as grading curves.

The natural moisture content of rock was determined on four selected cores in accordance with ISRM (2007).

Four rock cores were tested for their unconfined compressive strength in accordance with ISRM (2007).

Point load index tests were carried out on seventeen selected lengths of core in accordance with ISRM (2007).

Selected samples were despatched to i2 Analytical Ltd, where chemical analyses were carried out to in-house methods for a suite of contaminants. The results are presented in Appendix D.

GEOTECHNICAL ENGINEERING LIMITED

4. REFERENCES

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Key.

- Borehole Location
- Manhole Sampling Location
- Trial Pit Location

North

Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

Notes: Locations MH01, MH02, MH03, MH05, MH06, MH07 and MH08 are approximate. MH04 not shown.

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Client: TRIVALLIS

Site: PENRHYS VILLAGE, RHONDDA CYNON TAFF

Title: EXPLORATORY HOLE LOCATION PLAN

Drawn By:	AC	Checked By:	SP	Paper Size:	A3
Scale:	1:3500			Date:	August 2024
Contract:	38113			Figure:	1

APPENDIX A

FIELDWORK DATA

Geotechnical Engineering Limited

KEY TO EXPLORATORY HOLE LOGS

Sample type

D	Small disturbed	U	Undisturbed	L	Dynamic	ES	Environmental - soil	CS	Core subsample (prepared)
B	Bulk disturbed	UT	Undisturbed thin wall	C	Core	EW	Environmental - water	LS	Dynamic subsample (prepared)
LB	Large bulk disturbed	P	Piston	VC	Vibrocore	W	Water		

Test type

S SPT - Split spoon sampler followed by uncorrected SPT 'N' Value

C SPT - Solid cone followed by uncorrected SPT 'N' Value

(*250 - Where full test drive not completed, linearly extrapolated 'N' value reported, ** - Denotes no effective penetration). Arrow length reflects test depth range.

H Hand vane - direct reading in kPa - not corrected for BS1377 (1990). Re* denotes refusal. Where the limit of the equipment is reached during a test, the reported value is the minimum recorded shear strength of the material.

M Mackintosh probe - number of blows to achieve 100mm penetration

Mx Mexe cone - average reading of equivalent CBR value in %

PP Pocket penetrometer - calculated reading in kPa

Vo Headspace vapour reading, uncorrected peak values in ppm, using a PID (calibrated with isobutylene, using a 10.6eV bulb)

TR In situ thermal resistivity by needle probe in mK/W

Sample/core range/If

Dynamic sample

Undisturbed sample - open drive including thin wall. Symbol length reflects recovery

x = Total Core Recovery (TCR) as percentage of core run

y = Solid Core Recovery (SCR) as percentage of core run. Assessment of core is based on full diameter

z = Rock Quality Designation (RQD). The amount of solid core greater than 100mm expressed as percentage of core run

Where SPT has been carried out at the beginning of core run, disturbed section of core excluded from SCR and RQD assessment

If - fracture spacing - the modal fracture spacing (mm) over the indicated length of core. Where spacing varies significantly, the minimum, mode and maximum values are also given. NI = non-intact core NA = not applicable NR = no recovery

Instrumentation

Piezometer

Perforated standpipe

Inclinometer

Extensometer

Backfill

Granular response zone

Bentonite seal

Cement/ bentonite grout

Soil backfill

Concrete

Cover

Raised cover

Stopcock cover

Stratum boundaries

Estimated boundary

Grading boundary

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015+A1:2020

Chalk is logged in general accordance with Lord et al (2002) CIRIA C574. Where possible, dynamic samples in chalk have been logged in accordance with CIRIA C574; descriptions and gradings (if presented) should be treated with caution given the potential for sample disturbance.

For rocks the term fracture has been used to identify a mechanical break within the core. Where possible incipient and drilling induced fractures have been excluded from the assessment of fracture state. Where doubt exists, a note has been made in the descriptions. All fractures are considered to be continuous unless otherwise reported.

Made Ground is readily identified when, within the natural make up, man made constituents are evident. Where Made Ground appears to be reworked natural material the differentiation between in situ natural deposits and Made Ground is much more difficult to ascertain. The interpretation of Made Ground within the logs should therefore be treated with caution.

The descriptors "topsoil" and "tarmacadam" are used as generic terms and do not imply conformation to any particular standard or composition.

Rootlets are defined as being less than 2mm in diameter, roots are defined as in excess of 2mm diameter.

General comments

The process of drilling and sampling will inevitably lead to sample disturbance, mixing or loss of material in some soil and rocks.

Indicated water levels are those recorded during the process of drilling or excavating exploratory holes and may not represent standing water levels.

All depths are measured along the axis of the borehole and are related to ground level at the point of entry. All inclinations are measured normal to the axis of the core.

Where provided, the stratigraphical names/geological rock units are for guidance only and may not be wholly accurate.

Geotechnical Engineering Limited

BOREHOLE LOG

BH301

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 15 April 2024 Easting 300035 Scale 1:50

End Date 17 April 2024 Northing 195026 Ground Level 335.60mOD Depth 9.80 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.00 - 0.10							Grass over soft brown slightly sandy slightly gravelly clayey SILT with frequent rootlets and rare roots (up to 6mm diam). Gravel is angular and subangular fine to coarse concrete. (MADE GROUND)	0.10	335.50	
1ES	0.00 - 0.10										
2D	0.00 - 0.10										
2ES	0.10 - 0.30										
3B	0.10 - 0.30										
4D	0.10 - 0.30										
3ES	0.50 - 0.70										
5B	0.50 - 0.70										
6D	0.50 - 0.70										
4ES	1.00 - 1.20		Nil				C 20	Greyish brown clayey sandy angular and subangular fine to coarse concrete, limestone, sandstone and rare brick GRAVEL with a low angular to subrounded concrete cobble content and rare fragments (up to 1x5x6mm) of plastic and 8mm diam steel rebar. (MADE GROUND)			
7B	1.00 - 1.20										
8D	1.00 - 1.20										
9L	1.20 - 2.00							1.20m: Medium dense.	1.50	334.10	
5ES	1.80 - 1.90							Dense brown silty very sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)			
10D	1.90 - 2.00										
11L	2.00 - 3.00		Nil				C 42				
12D	2.80 - 2.90										
6ES	2.90 - 3.00										
13L	3.00 - 3.35		Nil				C *83				
		3.00									
14C	3.35 - 4.00	3.00	100	NI				Medium strong highly fractured light greyish brown fine and medium SANDSTONE. Fractures are randomly orientated very closely and closely spaced undulating smooth stained dark grey, dark brown and orangish brown.	3.35	332.25	
15D	3.40 - 3.50		0								
7ES	3.50 - 3.60		0								
16C	4.00 - 5.50	3.00					C *500				
		3.30	100								
			53								
			33	NI							
17D	4.40 - 4.50			80				Medium strong locally moderately weak light grey fine and medium SANDSTONE. Fractures are subhorizontal to 15° locally subvertical very closely and closely spaced planar rough stained orangish brown rarely infilled (up to 5mm) with brown sandy silt.	4.30	331.30	
				190				5.30m: 60° planar smooth fracture stained dark brown.			
18C	5.50 - 7.00	3.30	100				C *188	5.50 - 7.00m: Frequent subvertical locally extremely closely and very closely spaced undulating rough fractures stained orangish brown.			
			13					5.75 - 6.10m: Frequent thin and thick laminae of black coal.			
			8								
19D	6.50 - 6.60							6.65m: Rare thin and thick laminae of black coal.			
20C	7.00 - 7.60	3.30	90				C *750	7.20 - 7.35m: 2 no. 60° planar rough fractures stained orangish brown.			
			58								
			18								
21C	7.60 - 8.30	3.30	93	NI				Weak thinly laminated dark grey MUDSTONE. Fractures are subhorizontal and subvertical very closely to medium spaced planar and undulating smooth locally stained orangish brown.	7.65	327.95	
22D	7.80 - 7.90		26	40							
			19								

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand tools
1.20	3.35	Windowless Sample	Geotechnical Pioneer Rig
3.35	9.80	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	3.30

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	3.35
146	9.80

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	1.00	Bentonite pellets
1.00	2.50	Gravel
2.50	9.80	Bentonite pellets

INSTRUMENTATION

DEPTH (m)	TYPE
2.50	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
15-04-2024 11:20	0.00	Nil	
15-04-2024 15:30	1.20	Nil	Dry
16-04-2024 10:00	1.20	Nil	Dry
16-04-2024 15:30	8.30	3.30	2.80
17-04-2024 10:00	8.30	3.30	5.45
17-04-2024 11:00	9.80	3.30	5.00

REMARKS

Water flush used 3.35-9.80m. Driller notes loss of flush returns 4.00-9.80m.

AGS

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH301

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 15 April 2024 Easting 300035 Scale 1:50

End Date 17 April 2024 Northing 195026 Ground Level 335.60mOD Depth 9.80 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
					230							
23C	8.30	9.80	3.30	100								
24D	8.65	8.75		81								
				30								
			3.30					C *333	Borehole Completed at 9.80m	9.80	325.80	

HOLE CONSTRUCTION
TOP (m) BASE (m) TYPE PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush
DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH
DIAM (mm) BASE (m)

BARREL DIAMETER
DIAM (mm) BASE (m)

BACKFILL
TOP (m) BASE (m) MATERIAL

INSTRUMENTATION
DEPTH (m) TYPE

HOLE PROGRESS
DATE TIME DEPTH (m) CASING (m) WATER (m)

REMARKS

AGS

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH302

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 22 April 2024 Easting 300305 Scale 1:50

End Date 22 April 2024 Northing 195123 Ground Level 345.10mOD Depth 0.75 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10	0.30							Grass over soft dark brown slightly gravelly sandy clayey SILT with frequent roots (up to 5mm diam) and rootlets. Gravel is angular and subangular fine to coarse concrete, ceramic and sandstone. (MADE GROUND)	0.30	344.80	
1ES	0.10	0.30										
2D	0.10	0.30										
2ES	0.50	0.70							Dark brown sandy clayey angular and subangular fine to coarse sandstone, concrete and brick GRAVEL with frequent rootlets and frequent 12mm rebar. (MADE GROUND)	0.75	344.35	
3B	0.50	0.70							0.40 - 0.45m: Frequent metal wire mesh.			
4D	0.50	0.70							0.40 - 0.50m: Copper pipe wrapped in yellow plastic (35mm diam).			
									0.45 - 0.50m: Frequent dark grey wire wool.			
									0.50 - 0.55m: Frequent black plastic mesh sheet.			
									Borehole Completed at 0.75m			

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.75	Inspection Pit	Hand tools

WATER STRIKE Groundwater not encountered

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.75	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
22-04-2024 12:30	0.00	Nil	
22-04-2024 15:30	0.75	Nil	Dry

REMARKS

Borehole terminated at 0.75m due to hard strata. Relocated to BH302A.

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH302A

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 22 April 2024 Easting 300303 Scale 1:50

End Date 23 April 2024 Northing 195124 Ground Level 345.20mOD Depth 0.75 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10	0.30							Grass over dark brown clayey very gravelly fine to coarse SAND with a low angular and subangular concrete cobble content, frequent roots (up to 5mm diam), rootlets and rare wood fragments (up to 30x40x50mm). Gravel is angular and subangular fine to coarse sandstone, concrete, brick, ceramic and mudstone. (MADE GROUND)			
1ES	0.10	0.30							0.40 - 0.60m: Frequent steel reinforcement bar (up to 10mm diam) and frequent black plastic mesh sheeting.			
2D	0.10	0.30							0.50 - 0.65m: Frequent aluminium sheets (up to 40x170x700mm) and rare redundant cables (8mm diam).			
2ES	0.50	0.70										
3B	0.50	0.70										
4D	0.50	0.70								0.75	344.45	
									Borehole Completed at 0.75m			

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.75	Inspection Pit	Hand tools

WATER STRIKE Groundwater not encountered

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.75	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
22-04-2024 15:50	0.00	Nil	
22-04-2024 16:30	0.50	Nil	Dry
23-04-2024 09:15	0.50	Nil	Dry
23-04-2024 11:00	0.75	Nil	Dry

REMARKS

Borehole terminated at 0.75m due to hard strata. Relocated to BH302B.

AGS

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH302B

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 23 April 2024 Easting 300304 Scale 1:50

End Date 25 April 2024 Northing 195125 Ground Level 345.35mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grass over dark brown clayey sandy angular and subangular fine to coarse concrete, brick, and sandstone GRAVEL with a high subangular concrete and brick cobble content, frequent steel reinforcement bar (up to 10mm diam), frequent wood fragments (up to 80x120x300mm), rare copper cable wrapped in plastic (up to 12mm diam) and rare aluminium wire mesh. (MADE GROUND)			
1ES	0.10 - 0.30										
2D	0.10 - 0.30										
2ES	0.50 - 0.70										
3B	0.50 - 0.70										
4D	0.50 - 0.70										
3ES	1.00 - 1.20								0.90	344.45	
5B	1.00 - 1.20							0.10 - 0.20m: Steel fragment (160x300x450mm).			
6D	1.00 - 1.20	Nil					S 11	0.30 - 0.40m: Steel beam (60x170x900mm).			
7D	1.20 - 1.65							Medium dense dark brown clayey sandy angular and subangular fine to coarse sandstone and concrete GRAVEL. (MADE GROUND)			
8L	1.20 - 2.00								1.85	343.50	
4ES	1.50 - 1.60										
9D	1.60 - 1.70										
10D	2.00 - 2.45	Nil					S 25	Medium dense dark brown sandy very clayey angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)			
11L	2.00 - 3.00										
12D	2.20 - 2.30										
5ES	2.30 - 2.40										
13D	2.55 - 2.65								2.50	342.85	
6ES	2.65 - 2.75							Orangish brown very sandy very clayey angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)			
14D	3.00 - 3.31	Nil					S *94		2.80	342.55	
15C	3.00 - 4.00	2.90	100 3 0	NI NI 50				Weak grey SANDSTONE recovered non-intact. Where observed, fractures are subhorizontal to 10° very closely spaced and 80° to subvertical locally intersecting planar rough with orangish brown staining.			
16D	3.50 - 3.60										
17C	4.00 - 5.00	2.90	100 15 0				C *167				
18D	4.50 - 4.60										
19C	5.00 - 6.50	2.90	100 92 17	NI 45 100							
20D	5.40 - 5.50								5.20	340.15	
								Moderately weak and medium strong thinly bedded brownish grey fine and medium SANDSTONE. Fractures are 10° very closely and closely spaced and subvertical intersecting planar and undulating rough frequently stained orangish brown.			
								5.20 - 6.35m: Subvertical undulating rough fracture stained orangish brown.			
								5.85 - 5.90m: Frequent carbonaceous thin laminae.			
								6.20 - 6.25m: Frequent carbonaceous thin laminae.	6.35	339.00	
21C	6.50 - 8.00	2.90	100 71 59	NI 140 280				Moderately weak and medium strong grey fine and medium SANDSTONE. Fractures are subhorizontal to 10° closely and medium spaced and 80° to subvertical locally very closely spaced intersecting planar and undulating rough frequently stained dark grey and orangish brown.			
22D	6.95 - 7.00										
23C	8.00 - 9.50	2.90									

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand tools
1.20	3.00	Windowless Sample	Geotechnical Pioneer Rig
3.00	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	2.90

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	3.00
146	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	0.50	Gravel
0.50	2.80	Bentonite pellets
2.80	9.50	Gravel

INSTRUMENTATION

DEPTH (m)	TYPE
9.30	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
23-04-2024 11:00	0.00	Nil	
23-04-2024 14:30	1.20	Nil	Dry
24-04-2024 09:30	1.20	Nil	Dry
24-04-2024 16:30	5.00	2.90	2.50
25-04-2024 08:30	5.00	2.90	Dry
25-04-2024 11:35	9.50	2.90	7.89

REMARKS

Polymer flush used 3.00-5.00m. Water flush used 5.00-9.50m.
Driller notes loss of flush returns 4.00-9.50m.

AGS

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH302B

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 23 April 2024 Easting 300304 Scale 1:50

End Date 25 April 2024 Northing 195125 Ground Level 345.35mOD Depth 9.50 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
				98 94 65								
24D	8.90	9.00							9.00 - 9.20m: Fractures are very closely spaced stained dark grey and dark orangish brown.			
									Borehole Completed at 9.50m	9.50	335.85	

HOLE CONSTRUCTION
TOP (m) BASE (m) TYPE PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush
DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH
DIAM (mm) BASE (m)

BARREL DIAMETER
DIAM (mm) BASE (m)

BACKFILL
TOP (m) BASE (m) MATERIAL

INSTRUMENTATION
DEPTH (m) TYPE

HOLE PROGRESS
DATE TIME DEPTH (m) CASING (m) WATER (m)

REMARKS

AGS

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

BOREHOLE LOG

BH303

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 17 April 2024 Easting 300452 Scale 1:50

End Date 17 April 2024 Northing 195224 Ground Level 341.10mOD Depth 0.30 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30							Grass over soft brown slightly sandy slightly gravelly silty CLAY with frequent rootlets and rare roots (up to 5mm diam). Gravel is angular to subrounded fine to coarse sandstone and rare red brick. (MADE GROUND) 0.30m: Concrete across base of pit. Borehole Completed at 0.30m	0.30	340.80	

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.30	Inspection Pit	Hand tools

WATER STRIKE Groundwater not encountered

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
17-04-2024 15:00	0.00	Nil	
17-04-2024 15:30	0.30	Nil	Dry

REMARKS

Borehole terminated at 0.30m due to concrete obstruction across base of pit and reattempted as BH303A.

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH303A

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 17 April 2024 Easting 300450 Scale 1:50

End Date 17 April 2024 Northing 195222 Ground Level 341.10mOD Depth 0.30 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B 1ES 2D	0.10 - 0.30 0.10 - 0.30 0.10 - 0.30							Grass over very soft brown slightly sandy slightly gravelly silty CLAY with frequent rootlets and rare roots (up to 5mm diam). Gravel is angular to subrounded fine to coarse sandstone and rare red brick. (MADE GROUND) 0.30m: Concrete across base of pit. Borehole Completed at 0.30m	0.30	340.80	

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.30	Inspection Pit	Hand tools

WATER STRIKE Groundwater not encountered

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
17-04-2024 16:00	0.00	Nil	
17-04-2024 16:30	0.30	Nil	Dry

REMARKS

Borehole terminated at 0.30m due to concrete obstruction across base of pit and redrilled as BH303B.

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH303B

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 01 May 2024 Easting 300442 Scale 1:50

End Date 03 May 2024 Northing 195213 Ground Level 341.05mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1ES	0.10 - 0.30							Grass over very soft dark brown slightly sandy slightly gravelly silty CLAY with frequent rootlets and rare polystyrene fragments (up to 40x60x80mm). Gravel is angular and subangular fine to coarse sandstone and concrete. (MADE GROUND)	0.30	340.75	
1B	0.15 - 0.30										
2D	0.15 - 0.30										
2ES	0.50 - 0.70										
3B	0.50 - 0.70										
4D	0.50 - 0.70								0.80	340.25	
3ES	1.00 - 1.20							Dark brown very sandy very clayey angular and subangular fine to coarse concrete, brick and sandstone GRAVEL with a medium concrete and brick cobble content, rare rootlets, white plastic sheets (up to 2x90x160mm) and aluminium wire mesh (up to 40x70x600mm). (MADE GROUND)			
5B	1.00 - 1.20										
6D	1.00 - 1.20	Nil					S *231				
7D	1.20 - 1.42								1.40	339.65	
8L	1.20 - 2.00							0.30 - 1.00m: 35mm diameter steel pipe orientated vertically.			
4ES	1.60 - 1.70										
9D	1.60 - 1.70										
10D	2.00 - 2.37	Nil	96				S *68	Dark brown slightly clayey sandy angular and subangular fine to coarse concrete, brick, ceramic and sandstone GRAVEL with rare wood fragments (up to 40x40x70mm) and polystyrene fragments (up to 30x30x40mm). (MADE GROUND)	2.00	339.05	
11C	2.00 - 3.00	2.00	58								
			11								
12D	2.40 - 2.50			Nl				1.00 - 1.20m: Concrete footing in edge of pit.			
				60							
				200							
								Brown silty sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)			
13C	3.00 - 3.50	2.00	100					Strong grey fine and medium SANDSTONE. Fractures are subhorizontal to 10° very closely and closely spaced undulating rough and rarely subvertical locally stained orangish brown.			
			100								
			0								
14C	3.50 - 4.00	2.00	100					2.00 - 2.30m: Recovered non intact.			
15D	3.60 - 3.70		80								
			0								
16C	4.00 - 5.00	2.00	98								
			86								
			11								
17D	4.55 - 4.65										
18C	5.00 - 6.50	2.00	97								
			81								
19D	5.25 - 5.30		38					5.50 - 5.70m: Intersecting subvertical and 20° planar rough fractures stained orangish brown.			
20CS	6.12 - 6.32										
21C	6.50 - 8.00	2.00	100	60				6.50 - 8.90m: Medium strong and strong. Fractures becoming closely and medium spaced.			
			100	100							
			59	260							
22CS	7.25 - 7.45										
23D	7.70 - 7.75										
24C	8.00 - 9.50	2.00									

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand tools
1.20	2.00	Windowless Sample	Geotechnical Pioneer Rig
2.00	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	2.00

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	2.00
146	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	0.50	Gravel
0.50	1.00	Bentonite pellets
1.00	2.40	Gravel

INSTRUMENTATION

DEPTH (m)	TYPE
2.40	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
01-05-2024 15:00	0.00	Nil	
01-05-2024 16:15	1.00	Nil	Dry
02-05-2024 12:20	1.00	Nil	Dry
02-05-2024 16:50	4.00	2.00	3.10
03-05-2024 08:40	4.00	2.00	Dry
03-05-2024 11:40	9.50	2.00	3.10

REMARKS

Polymer flush used 2.00-4.00m. Water flush used 4.00-9.50m. Driller notes reduced flush returns (40%) 3.00-3.50m. Driller notes loss of flush returns 3.50-9.50m.

CONTRACT	CHECKED
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Geotechnical Engineering Limited

BOREHOLE LOG

BH303B

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 01 May 2024 Easting 300442 Scale 1:50

End Date 03 May 2024 Northing 195213 Ground Level 341.05mOD Depth 9.50 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
				100 97 80								
					NI 130 170				Medium strong greyish brown locally orangish brown fine to coarse SANDSTONE with frequent quartz and carbonaceous clasts (up to 10mm) and vugs (up to 6x6x15mm). Fractures are subhorizontal to 15° closely spaced undulating rough stained orangish brown.	8.90	332.15	
25D	9.40	9.50							9.35 - 9.38m: Orangish brown silty clay.	9.50	331.55	
									Borehole Completed at 9.50m			

HOLE CONSTRUCTION
TOP (m) BASE (m) TYPE PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush
DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH
DIAM (mm) BASE (m)

BARREL DIAMETER
DIAM (mm) BASE (m)

BACKFILL
TOP (m) BASE (m) MATERIAL
2.40 9.50 Bentonite pellets

INSTRUMENTATION
DEPTH (m) TYPE

HOLE PROGRESS
DATE TIME DEPTH (m) CASING (m) WATER (m)

REMARKS

AGS

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BOREHOLE LOG

BH304

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 25 April 2024 Easting 300063 Scale 1:50

End Date 29 April 2024 Northing 194811 Ground Level 310.00mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grass over very soft dark brown slightly gravelly sandy clayey SILT with frequent rootlets and rare wood fragments (up to 30x30x40mm). Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.40	309.60	
1ES	0.10 - 0.30										
2D	0.10 - 0.30										
2ES	0.50 - 0.70							Soft yellowish brown slightly sandy gravelly silty CLAY. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.75	309.25	
3B	0.50 - 0.70										
4D	0.50 - 0.70										
3ES	0.90 - 1.10										
5B	0.90 - 1.10										
6D	0.90 - 1.10	1.10					S 18				
7D	1.10 - 1.55							Dark yellowish brown very silty very sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)	1.35	308.65	
8L	1.10 - 2.00										
9D	1.60 - 1.70										
4ES	1.70 - 1.80										
10D	2.00 - 2.45	1.10					S 23	Stiff orangish brown slightly sandy slightly gravelly silty CLAY. Gravel is angular fine to coarse sandstone. (MADE GROUND)			
11L	2.00 - 2.90										
12D	2.30 - 2.40								2.20	307.80	
5ES	2.40 - 2.50							Medium dense becoming dense brown slightly gravelly silty fine and medium SAND. Gravel is angular fine to coarse sandstone. (MADE GROUND)			
13L	2.90 - 3.60	1.10 2.90					C 39				
14D	3.40 - 3.50										
6ES	3.50 - 3.60										
15C	3.60 - 5.00	3.60	100 33 17	NI 60 170			C *188	Moderately weak and medium strong locally strong thinly bedded light grey fine and medium SANDSTONE. Fractures are subhorizontal to 10° very closely and closely spaced planar rough and 70° to 80° undulating rough stained orangish brown. 3.60 - 4.25m: Recovered non-intact as sandy gravel.	3.60	306.40	
16D	4.70 - 4.80										
17C	5.00 - 6.50	3.60	99 84 15				C *333				
18D	6.00 - 6.10										
19C	6.50 - 8.00	3.60	90 70 44				C *750	6.35 - 6.50m: Frequent very thin beds of extremely weak dark bluish grey mudstone.			
20D	7.40 - 7.50							7.55 - 7.60m: Weak greyish brown mudstone. 7.55 - 7.90m: Frequent thin laminae of black coal.			
21C	8.00 - 9.50	3.60						Weak very thinly bedded dark grey MUDSTONE recovered non-intact.	7.90	302.10	

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.10	Inspection Pit	Hand tools
1.10	3.60	Windowless Sample	Geotechnical Pioneer Rig
3.60	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	3.60

BARREL DIAMETER

DIAM (mm)	BASE (m)
128	3.60
146	6.50
116	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	0.50	Gravel
0.50	1.00	Bentonite pellets
1.00	3.60	Gravel

INSTRUMENTATION

DEPTH (m)	TYPE
3.60	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
25-04-2024 15:00	0.00	Nil	
25-04-2024 16:00	1.10	Nil	Dry
26-04-2024 11:05	1.10	Nil	Dry
26-04-2024 16:00	6.50	3.60	5.06
29-04-2024 09:30	6.50	3.60	6.50
29-04-2024 12:25	9.50	3.60	4.20

REMARKS

Water flush used 3.60-9.50m. Driller notes reduced flush returns (20%) 6.50-9.50m. Driller notes loss of flush returns 3.60-6.50m. On completion, borehole collapsed from 9.50 to 9.10m.

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH304

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 25 April 2024 Easting 300063 Scale 1:50

End Date 29 April 2024 Northing 194811 Ground Level 310.00mOD Depth 9.50 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
				89	NI							
				61								
				61								
22CS	8.45	8.65			120				Strong greyish brown fine and medium SANDSTONE. Fractures are subhorizontal closely and medium spaced planar rough stained orangish brown.	8.40	301.60	
					140							
					340				9.15 - 9.50m: Subvertical undulating rough fracture stained orangish brown.			
									Borehole Completed at 9.50m	9.50	300.50	

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
3.60	9.10	Bentonite pellets
9.10	9.50	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)

REMARKS

AGS

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BOREHOLE LOG

BH305

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 30 April 2024 Easting 300341 Scale 1:50

End Date 01 May 2024 Northing 194945 Ground Level 320.75mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grass over soft brown slightly sandy silty CLAY with frequent rootlets. (MADE GROUND)	0.10	320.65	
1ES	0.10 - 0.30										
2D	0.10 - 0.30										
2ES	0.50 - 0.70							Soft brown slightly sandy slightly gravelly silty CLAY with frequent pockets (up to 30x40x40mm) of stiff slightly gravelly silty clay. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)			
3B	0.50 - 0.70										
4D	0.50 - 0.70										
3ES	0.90 - 1.10										
5B	0.90 - 1.10										
6D	0.90 - 1.10								1.10	319.65	
4ES	1.20 - 1.30	Nil	80				C <1	Very loose grey subangular concrete COBBLES with some subangular fine to coarse concrete gravel and rare fragments of steel rebar and plywood. (MADE GROUND)			
7C	1.20 - 1.70										
8D	1.20 - 1.30										
9L	1.70 - 2.00	Nil							1.70	319.05	
10D	2.00 - 2.45	Nil					S 33	Dense brown sandy very clayey angular and subangular fine to coarse sandstone and rare concrete and limestone GRAVEL with a low tabular sandstone cobble content. (MADE GROUND)			
11L	2.00 - 3.00										
12D	2.50 - 2.60										
5ES	2.50 - 2.60										
13D	3.00 - 3.45	3.00					S 6				
14L	3.00 - 4.00							Loose brown very gravelly very clayey fine and medium SAND. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	3.10	317.65	
15D	3.80 - 3.90										
6ES	3.80 - 3.90										
16L	4.00 - 4.40	3.00					S *65	4.00m: Very dense.			
17C	4.40 - 5.00	4.40	100	NI				Medium strong light greyish brown fine and medium SANDSTONE. Fractures are subhorizontal to 20° very closely and closely spaced planar rough and 80° to subvertical undulating rough locally stained orangish brown.	4.40	316.35	
18D	4.50 - 4.60		87	90							
			18	180							
19C	5.00 - 6.50	4.40	93				C *750				
20D	5.20 - 5.30		85								
			68								
21C	6.50 - 7.50	4.40	100				C *167	6.50 - 9.00m: Subvertical fractures locally very closely spaced.			
			77								
			37								
22D	7.00 - 7.10										
23C	7.50 - 8.00	4.40	100								
			20								
			20								
24C	8.00 - 9.50	4.40						Continued Next Page			

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	1.20	Inspection Pit	Hand tools
1.20	1.70	Rotary Core	Geotechnical Pioneer Rig
1.70	4.40	Windowless Sample	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	4.40

BARREL DIAMETER

DIAM (mm)	BASE (m)
146	1.70
128	4.40
146	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	0.50	Gravel
0.50	1.00	Bentonite pellets
1.00	3.20	Gravel

INSTRUMENTATION

DEPTH (m)	TYPE
3.20	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
30-04-2024 12:10	0.00	Nil	
30-04-2024 15:00	4.40	4.40	1.74
01-05-2024 08:40	4.40	4.40	Dry
01-05-2024 13:00	9.50	4.40	7.40

REMARKS

Water flush used 1.20-1.70m and 4.40-9.50m. Driller notes reduced flush returns (40%) 5.00-6.50m. Driller notes loss of flush returns 1.20-1.70m, 4.40-5.00m and 6.50-9.50m. Driller notes borehole collapse back to 9.00m. On completion, borehole collapse from 9.50 to 9.00m.

AGS

CONTRACT	CHECKED
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Geotechnical Engineering Limited

BOREHOLE LOG

BH305

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 30 April 2024 Easting 300341 Scale 1:50

End Date 01 May 2024 Northing 194945 Ground Level 320.75mOD Depth 9.50 m

sample no & type	sample depth (m) from	to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
				91 23 19					8.00 - 8.25m: Extremely closely spaced 70° undulating rough fractures.			
25D	8.80	8.90										
									Borehole Completed at 9.50m	9.50	311.25	

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
4.40	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)

BARREL DIAMETER

DIAM (mm)	BASE (m)

BACKFILL

TOP (m)	BASE (m)	MATERIAL
3.20	9.00	Bentonite pellets
9.00	9.50	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)

REMARKS

AGS

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BOREHOLE LOG

BH306

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 18 April 2024 Easting 300591 Scale 1:50

End Date 19 April 2024 Northing 195103 Ground Level 311.10mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
C	0.00 - 0.15		100					Grey CONCRETE. (MADE GROUND)	0.15	310.95	
1B	0.15 - 0.30							Soft brown slightly sandy gravelly silty CLAY. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.40	310.70	
1ES	0.15 - 0.30							Soft dark orangish brown slightly sandy gravelly clayey SILT. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.85	310.25	
2D	0.15 - 0.30							Very dense brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a low subangular sandstone cobble content. (MADE GROUND)	1.75	309.35	
2ES	0.50 - 0.70							Very weak and weak thinly bedded brownish grey fine and medium SANDSTONE. Fractures are subhorizontal and subvertical very closely and closely spaced planar rough stained orangish brown.			
3B	0.50 - 0.70							3.00 - 4.00m: Recovered largely non intact.			
4D	0.50 - 0.70							3.60 - 4.00m: Frequent intersecting 70° undulating rough fractures infilled with sandy clay.	4.00	307.10	
3ES	0.90 - 1.00							Medium strong locally strong grey fine and medium SANDSTONE. Fractures are subhorizontal to 20° very closely to medium spaced planar rough stained orangish brown.			
5B	0.90 - 1.00	Nil	78	NA			S *52	4.10 - 4.20m: Subvertical fracture stained orangish brown.			
6D	0.90 - 1.00		24								
7D	1.00 - 1.45		0								
8C	1.00 - 2.00										
9D	1.75 - 1.85			NI							
10C	2.00 - 3.00	Nil	90	NI 140			C *77				
			48								
			14								
11D	2.40 - 2.50										
12C	3.00 - 4.00	2.00	78				C *71				
			12								
			0								
13D	3.50 - 3.60										
14C	4.00 - 5.00	2.00	100	30							
15D	4.20 - 4.25		100	90							
			72	220							
16C	5.00 - 6.50	4.30	77								
			77								
			35								
17CS	5.50 - 5.70										
18D	6.05 - 6.10										
19C	6.50 - 8.00	4.30	100								
20CS	6.72 - 6.94		100								
			47								
								7.00 - 7.08m: Subvertical fracture stained orangish brown.			
				40				Moderately weak greyish brown fine to coarse SANDSTONE (tending to matrix supported breccia) with frequent quartz clasts (up to 10mm) and vugs (up to 2x10x20mm). Fractures are subhorizontal very closely and closely spaced undulating rough stained orangish brown.	7.20	303.90	
				90							
				190							
21D	7.90 - 8.00										
22C	8.00 - 9.50	4.30									

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.15	Rotary Core	Geotechnical Pioneer Rig
0.15	1.00	Inspection Pit	Hand Tools
1.00	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	4.30

BARREL DIAMETER

DIAM (mm)	BASE (m)
300	0.15
146	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.30	Concrete
0.30	3.00	Bentonite pellets
3.00	8.20	Gravel
8.20	9.50	Arisings

INSTRUMENTATION

DEPTH (m)	TYPE
8.20	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
18-04-2024 11:20	0.00	Nil	
18-04-2024 16:00	5.00	2.00	1.00
19-04-2024 08:30	5.00	2.00	4.90
19-04-2024 15:00	9.20	2.00	1.00

REMARKS

On completion, borehole collapsed from 9.50 to 8.20m.

CONTRACT	CHECKED
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Geotechnical Engineering Limited

BOREHOLE LOG

BH306

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 18 April 2024 Easting 300591 Scale 1:50

End Date 19 April 2024 Northing 195103 Ground Level 311.10mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
			83 79 73								
23CS	8.50 - 8.80			50 140 300				Medium strong grey and greyish brown fine and medium SANDSTONE with rare quartz clasts (up to 5mm). Fractures are subhorizontal closely and medium spaced planar and undulating rough.	8.30	302.80	
				40 90 200				Medium strong light grey fine SANDSTONE. Fractures are subhorizontal and subvertical very closely and closely spaced planar rough stained dark grey.	9.00	302.10	
								Borehole Completed at 9.50m	9.50	301.60	

HOLE CONSTRUCTION
TOP (m) BASE (m) TYPE PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush
DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH
DIAM (mm) BASE (m)

BARREL DIAMETER
DIAM (mm) BASE (m)

BACKFILL
TOP (m) BASE (m) MATERIAL

INSTRUMENTATION
DEPTH (m) TYPE

HOLE PROGRESS
DATE TIME DEPTH (m) CASING (m) WATER (m)

REMARKS

AGS

CONTRACT	CHECKED
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BOREHOLE LOG

BH307

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 2

Start Date 07 May 2024 Easting 300282 Scale 1:50

End Date 09 May 2024 Northing 194546 Ground Level 285.10mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
1B	0.10 - 0.30							Grass over soft brown slightly sandy slightly gravelly silty CLAY with frequent rootlets. Gravel is angular and subangular fine to coarse sandstone.			
1ES	0.10 - 0.30										
2D	0.10 - 0.30										
2ES	0.30 - 0.50										
3B	0.30 - 0.50	Nil					S *300				
4D	0.30 - 0.50		100	NA				Brown silty very sandy angular and subangular fine to coarse sandstone GRAVEL with a low tabular sandstone cobble content.	0.60	284.50	
5C	0.60 - 1.00										
3ES	0.90 - 1.00						C *65				
6D	0.90 - 1.00	Nil						0.90 - 1.00m: Brown and dark grey silty very gravelly fine and medium sand. Gravel is angular and subangular fine to coarse sandstone.			
7C	1.00 - 2.00		85								
4ES	1.20 - 1.30										
8D	1.20 - 1.30			NI					1.40	283.70	
								Medium strong highly fractured light greyish brown fine and medium SANDSTONE recovered non intact as angular and subangular gravel.			
9C	2.00 - 3.00	1.90	84								
			14								
			0	NI					2.30	282.80	
				130				Moderately weak locally strong light grey fine and medium SANDSTONE. Fractures are subhorizontal to 10° closely and medium spaced undulating rough locally stained orangish brown.			
				570							
10D	2.70 - 2.80										
11C	3.00 - 4.00	1.90	100					2.30 - 3.00m: Recovered non intact.			
			100								
			0								
12C	4.00 - 5.00	2.90	100								
13CS	4.05 - 4.25		94								
			83					4.25 - 4.30m: Very weak thickly laminated dark greyish brown siltstone.			
								4.42 - 4.45m: 30° laminae of black coal.			
14D	4.80 - 4.85							4.80 - 5.00m: Subvertical planar rough fractures.			
15C	5.00 - 6.50	2.90	100								
			99								
			71								
16D	5.70 - 5.78										
17CS	5.80 - 6.10										
18C	6.50 - 8.00	2.90	91								
			89					6.63 - 6.65m: Subhorizontal laminae of black coal.			
			68								
19D	7.70 - 7.75							7.70 - 7.76m: 50° planar rough fracture stained orangish brown.			
20C	8.00 - 9.50	2.90									

Continued Next Page

HOLE CONSTRUCTION

TOP (m)	BASE (m)	TYPE	PLANT USED
0.00	0.60	Inspection Pit	Hand Tools
0.60	9.50	Rotary Core	Geotechnical Pioneer Rig

WATER STRIKE Groundwater not encountered prior to use of flush

DEPTH (m)	CASING (m)	ROSE TO (m)	AFTER (min)	REMARKS

CASING DEPTH

DIAM (mm)	BASE (m)
168	2.90

BARREL DIAMETER

DIAM (mm)	BASE (m)
146	9.50

BACKFILL

TOP (m)	BASE (m)	MATERIAL
0.00	0.50	Concrete
0.50	1.40	Bentonite pellets
1.40	9.50	Gravel

INSTRUMENTATION

DEPTH (m)	TYPE
9.50	Standpipe (50mm) with geosock

HOLE PROGRESS

DATE TIME	DEPTH (m)	CASING (m)	WATER (m)
07-05-2024 14:30	0.00	Nil	
07-05-2024 15:30	0.60	Nil	Dry
08-05-2024 11:20	0.60	Nil	Dry
08-05-2024 16:00	3.00	1.90	0.00
09-05-2024 09:30	3.00	1.90	2.00
09-05-2024 16:20	9.50	2.90	0.10

REMARKS

Water flush used 0.60-3.00m. Polymer flush used 3.00-9.50m.
Driller notes reduced flush returns (50%) 3.00-9.50m

CONTRACT	CHECKED
38113	JH

Geotechnical Engineering Limited

BOREHOLE LOG

BH307

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 2 of 2

Start Date 07 May 2024 Easting 300282 Scale 1:50

End Date 09 May 2024 Northing 194546 Ground Level 285.10mOD Depth 9.50 m

sample no & type	sample depth (m) from to	casing depth (m)	samp. /core range	If	water record depth (m)	instru-ment	test type & value	description	depth (m)	reduced level (m)	legend
			95 86 81					8.00 - 8.38m: Intersecting subvertical undulating rough fractures stained orangish brown.			
21CS	8.40 - 8.72										
22D	8.95 - 9.05										
								Borehole Completed at 9.50m	9.50	275.60	

HOLE CONSTRUCTION
TOP (m) BASE (m) TYPE PLANT USED

WATER STRIKE Groundwater not encountered prior to use of flush
DEPTH (m) CASING (m) ROSE TO (m) AFTER (min) REMARKS

CASING DEPTH
DIAM (mm) BASE (m)

BARREL DIAMETER
DIAM (mm) BASE (m)

BACKFILL
TOP (m) BASE (m) MATERIAL

INSTRUMENTATION
DEPTH (m) TYPE

HOLE PROGRESS
DATE TIME DEPTH (m) CASING (m) WATER (m)

REMARKS

AGS

CONTRACT	CHECKED
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Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive				test drive								test type	N	energy ratio %
						blows		pen (mm)		blows				pen (mm)						
BH301	1.20		1.65	Nil	Dry	10	8	75	75	7	6	4	3	75	75	75	75	C	20	84
BH301	2.00		2.45	Nil	Dry	5	8	75	75	11	10	12	9	75	75	75	75	C	42	84
BH301	3.00		3.31	Nil	Dry	4	19	75	55	22	19	9		75	75	30		C	83	84
BH301	4.00		4.06	3.00	1.14	25		30		50				30				C	500	84
BH301	5.50		5.70	3.30	2.30	12	13	75	45	30	20			75	5			C	188	84
BH301	7.00		7.06	3.30	2.89	25		40		50				20				C	750	84
BH301	9.80		9.92	3.30	5.00	25		75		50				45				C	333	84
BH302B	1.20		1.65	Nil	Dry	1	2	75	75	1	2	3	5	75	75	75	75	S	11	74
BH302B	2.00		2.45	Nil	Dry	5	5	75	75	7	9	4	5	75	75	75	75	S	25	74
BH302B	3.00		3.31	Nil	Dry	1	7	75	75	19	21	10		75	75	10		S	94	74
BH302B	4.00		4.24	2.90	1.00	5	16	75	75	20	30			75	15			C	167	74
BH303B	1.20		1.42	Nil	Dry	1	3	75	75	50				65				S	231	84
BH303B	2.00		2.37	Nil	Dry	7	10	75	75	12	13	25		75	75	70		S	68	84
BH304	1.10		1.55	1.10	Dry	3	3	75	75	4	4	5	5	75	75	75	75	S	18	84
BH304	2.00		2.45	1.10	Dry	6	5	75	75	4	5	7	7	75	75	75	75	S	23	84
BH304	2.90		3.35	1.10	Dry	11	8	75	75	9	9	11	10	75	75	75	75	C	39	84
BH304	3.60		3.75	3.60	0.00	25		70		35	15			75	5			C	188	84
BH304	5.00		5.11	3.60	1.11	25		65		50				45				C	333	84
BH304	6.50		6.57	3.60	4.80	25		50		50				20				C	750	84
BH305	1.20		1.65	Nil	Dry	4	0	75	75	0	0	0	0	75	75	75	75	C	<1	84

notes:
1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

STANDARD PENETRATION TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole no.	borehole depth (m)	s.w.p (mm)	base depth (m)	casing depth (m)	water level (m)	seating drive		test drive				test type	N	energy ratio %
						blows	pen (mm)	blows				pen (mm)						
BH305	2.00		2.45	Nil	Dry	5 5	75 75	6 7 9 11				75 75 75 75				S	33	84
BH305	3.00		3.45	3.00	Dry	1 0	75 75	1 1 2 2				75 75 75 75				S	6	84
BH305	4.00		4.38	3.00	Dry	4 4	75 75	4 14 21 11				75 75 75 5				S	65	84
BH305	5.00		5.09	4.40	3.60	25	70	50				20				C	750	84
BH305	6.50		6.71	4.40	6.00	11 14	75 45	37 13				75 15				C	167	84
BH306	1.00		1.44	Nil	Dry	3 7	75 75	7 12 10 21				75 75 75 65				S	52	84
BH306	2.00		2.35	Nil	Dry	3 8	75 75	12 24 14				75 75 45				C	77	84
BH306	3.00		3.36	2.00	1.00	6 19	75 75	24 18 8				75 75 60				C	71	84
BH307	0.60		0.80	Nil	Dry	10 15	75 75	50				50				S	300	84
BH307	1.00		1.38	Nil	0.10	4 10	75 75	13 19 18 0				75 75 75 5				C	65	84

notes:
1. Test carried out in general accordance with BS EN ISO 22476-3:2005 + A1:2011
2. s.w.p = self weight penetration.
3. N values have not been subjected to any correction.
4. Test carried out using split spoon S, solid cone C.
5. Where full test drive not completed, linearly extrapolated N value reported.
6. ** Denotes no effective penetration.

CONTRACT	CHECKED
38113	**JH**

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TRIAL PIT LOG

TP101

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 01 May 2024 Easting 300062 Scale 1:25

End Date 01 May 2024 Northing 195074 Ground Level 339.65mOD Depth 1.00 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Black TARMACADAM. (MADE GROUND)	0.08	339.57	
					Grey sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)	0.14	339.51	
					Black TARMACADAM. (MADE GROUND)	0.25	339.40	
1B 1ES	0.50 - 0.60 0.50				Reddish brown silty sandy angular and subangular fine to coarse sandstone GRAVEL with a low subangular sandstone cobble content. (MADE GROUND)	0.60	339.05	
					Brown silty sandy angular and subangular fine to coarse sandstone GRAVEL with a high subangular sandstone cobble content. (MADE GROUND)			
					Trial pit Completed at 1.00m	1.00	338.65	

Equipment: Pit excavated by Road Saw and CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.40m

Sidewall stability: Minor spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Tarmacadam 0.00 - 0.20m.
Arisings 0.20 - 1.00m.

Remarks: Trial pit terminated at 1.00m due to hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP102

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 02 May 2024 Easting 300394 Scale 1:25

End Date 02 May 2024 Northing 195237 Ground Level 347.20mOD Depth 0.70 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Black TARMACADAM. (MADE GROUND)	0.10	347.10	
					Grey sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)	0.40	346.80	
1B 1ES	0.50 - 0.70 0.50				Greyish brown slightly clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a medium angular and subangular sandstone cobble content. (MADE GROUND)	0.70	346.50	
					Trial pit Completed at 0.70m			

Equipment: Pit excavated by Road Saw and CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.40m

Sidewall stability: Minor spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Tarmacadam 0.00 - 0.20m.
Arisings 0.20 - 0.70m.

Remarks: Trial pit terminated at 0.70m on hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP106

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 08 May 2024 Easting 300174 Scale 1:25

End Date 08 May 2024 Northing 194736 Ground Level 296.10mOD Depth 0.30 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over brown silty gravelly fine and medium SAND with a low sandstone, brick and concrete cobble content. Gravel is angular and subangular fine to coarse sandstone, brick and concrete. Rare fragments of steel rebar and plastic. (MADE GROUND) 0.00 - 0.10m: Kerbstone in west face of pit 0.10 - 0.30m: Concrete beneath kerbstone Trial pit Completed at 0.30m	0.30	295.80	

Equipment: Pit excavated by Hand tools

Pit width x length: 0.80m x 1.50m

Sidewall stability: Stable

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 0.30m.

Remarks: Trial pit terminated at 0.30m as unable to dig horizontally towards assumed heating pipe without undermining adjacent pavement.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP107

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 02 May 2024 Easting 300266 Scale 1:25

End Date 02 May 2024 Northing 194878 Ground Level 311.85mOD Depth 0.60 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Black TARMACADAM. (MADE GROUND)	0.10	311.75	
					Grey sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND)	0.40	311.45	
1B 1ES	0.50 - 0.60 0.50				Greyish brown very clayey very sandy angular and subangular fine to coarse sandstone GRAVEL with a low angular and subangular sandstone cobble content. (MADE GROUND)	0.60	311.25	
					Trial pit Completed at 0.60m			

Equipment: Pit excavated by Road Saw and CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.40m

Sidewall stability: Minor spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Tarmacadam 0.00 - 0.20m.
Arisings 0.20 - 0.60m.

Remarks: Trial pit terminated at 0.60m on hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP201

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 24 April 2024 Easting 300000 Scale 1:25

End Date 24 April 2024 Northing 194996 Ground Level 334.65mOD Depth 3.00 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft brown slightly gravelly sandy silty CLAY with frequent roots (up to 5mm) and rootlets. Gravel is angular and subangular fine to coarse brick, concrete and sandstone (MADE GROUND)			
					Greyish brown clayey very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a low subangular brick, concrete and sandstone cobble content and low concrete boulder content. Rare fragments of steel rebar and metal. (MADE GROUND)	0.30	334.35	
1B 1ES	0.50 - 0.70 0.50							
2B 2ES	1.00 - 1.20 1.00							
3B 3ES	1.50 - 1.70 1.50							
4B 4ES	2.00 - 2.20 2.00							
					Orangish brown and greyish brown clayey very sandy angular and subangular fine to coarse sandstone GRAVEL with a medium angular and subangular sandstone cobble content and low sandstone boulder content. (MADE GROUND)	2.20	332.45	
5B 5ES	2.50 - 2.70 2.50							
					Trial pit Completed at 3.00m	3.00	331.65	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.10m x 2.70m

Sidewall stability: Minor spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 3.00m.

Remarks: Trial pit terminated at 3.00m on hard strata. Soakaway test undertaken, results presented separately.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP202

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 22 April 2024 Easting 300163 Scale 1:25

End Date 22 April 2024 Northing 195072 Ground Level 337.65mOD Depth 2.10 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft brown slightly gravelly sandy silty CLAY with a low angular sandstone, brick and concrete cobble content and frequent roots (up to 5mm diam) and rootlets. Gravel is angular fine to coarse brick, concrete and sandstone. (MADE GROUND)	0.20	337.45	
1B 1ES	0.50 - 0.70 0.50				Reddish brown sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a high angular and subangular sandstone, brick and concrete cobble content. (MADE GROUND) 0.40 - 0.90m: Brick wall in north face of pit (in situ).			
						0.90	336.75	
2B 2ES	1.00 - 1.20 1.00				Brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a high angular and subangular sandstone cobble content. (MADE GROUND) 0.90 - 1.20m: Concrete footing in north face of pit.			
3B 3ES	1.50 - 1.70 1.50							
4ES	2.00							
					Trial pit Completed at 2.10m	2.10	335.55	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 0.70m x 2.50m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.10m.

Remarks: Trial pit terminated at 2.10m on hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP203

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 03 May 2024 Easting 300300 Scale 1:25

End Date 03 May 2024 Northing 195162 Ground Level 348.65mOD Depth 0.60 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grey CONCRETE. (MADE GROUND)	0.15	348.50	
					Greyish brown sandy angular and subangular fine to coarse sandstone GRAVEL. (MADE GROUND) 0.20m: Steel reinforcement (5mm diam) grid.	0.40	348.25	
1B 1ES	0.50 - 0.60 0.50				Dark greyish brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a high angular sandstone cobble content and low sandstone and concrete boulder content. Rare fragments of metal, wood and kerbstones. (MADE GROUND) 0.40 - 0.60m: Concrete beam with 10mm diam steel reinforcement orientate east-west across pit extending under slab.	0.60	348.05	
					Trial pit Completed at 0.60m			

Equipment: Pit excavated by Floor Saw and CAT308-07 9T Tracked Excavator

Pit width x length: 1.20m x 2.30m

Sidewall stability: Spalling in sidewalls.

Groundwater: Groundwater not encountered

Backfill: Concrete 0.00 - 0.20m.
Arisings 0.20 - 0.60m.

Remarks: Trial pit terminated at 0.60m due to undermining concrete slab.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP204

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 23 April 2024 Easting 300395 Scale 1:25

End Date 23 April 2024 Northing 195203 Ground Level 344.25mOD Depth 2.40 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over dark greyish brown clayey sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium angular and subangular brick, concrete and sandstone cobble content and low concrete boulder content. Frequent fragments of wood, metal, wire, rags, plastic and steel rebar. (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50				0.00 - 0.50m: Frequent roots (up to 10mm diam) and rootlets.			
2B 2ES	1.00 - 1.20 1.00							
3B 3ES	1.50 - 1.70 1.50 - 1.70				Brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a medium angular and subangular sandstone cobble content. (MADE GROUND)	1.50	342.75	
4B 4ES	2.00 - 2.20 2.00							
					2.40m: Grey sandstone across base of pit.	2.40	341.85	
					Trial pit Completed at 2.40m			

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.00m x 2.20m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.40m.

Remarks: Trial pit terminated at 2.40m on hard strata. Soakaway test undertaken, results presented separately.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP205

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 25 April 2024 Easting 300376 Scale 1:25

End Date 25 April 2024 Northing 195158 Ground Level 343.60mOD Depth 2.10 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over brown clayey sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium brick, concrete and sandstone cobble content and low concrete boulder content. Frequent fragments of steel rebar (10mm diam). (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50							
2B 2ES	1.00 - 1.20 1.00 - 1.20				Dark greyish brown slightly clayey very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium brick, concrete and sandstone cobble content and low concrete boulder content. Frequent fragments of steel rebar (10mm diam), wire, plastic bags, textiles, metal and wood. (MADE GROUND)	1.00	342.60	
3B 3ES	1.50 - 1.70 1.50							
4B 4ES	2.00 - 2.10 2.00				2.10m: Grey sandstone across base of pit. Trial pit Completed at 2.10m	2.10	341.50	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 0.90m x 2.20m

Sidewall stability: Slight spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.10m.

Remarks: Trial pit terminated at 2.10m on hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP206

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 23 April 2024 Easting 300494 Scale 1:25

End Date 23 April 2024 Northing 195174 Ground Level 330.25mOD Depth 0.60 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES	0.50 - 0.60 0.50				Grass over greyish brown silty very gravelly fine to coarse SAND with a medium angular and subangular brick, concrete and sandstone cobble content and low concrete boulder content. Gravel is angular and subangular fine to coarse brick, concrete and sandstone. Frequent roots (up to 5mm diam) and rootlets and rare fragments of wood, metal, wire, rags, plastic and steel rebar. (MADE GROUND)			
					0.60m: Concrete and man hole chamber across base of pit.	0.60	329.65	
					Trial pit Completed at 0.60m			

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.50m x 2.50m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 0.60m.

Remarks: Trial pit terminated at 0.60m due to concrete and man hole chamber across base of pit.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP206A

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 29 April 2024 Easting 300509 Scale 1:25

End Date 29 April 2024 Northing 195175 Ground Level 329.10mOD Depth 1.00 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
1B 1ES	0.50 - 0.70 0.50				Grass over brown clayey very sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a high angular and subangular sandstone, brick and concrete cobble content and high sandstone and concrete boulder content. Rare rootlets and fragments of plastic and textile rags. (MADE GROUND)			
					1.00m: Grey sandstone across base of pit. Trial pit Completed at 1.00m	1.00	328.10	

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.00m x 2.50m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.00m.

Remarks: Trial pit terminated at 1.00m on hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP207

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 24 April 2024 Easting 300019 Scale 1:25

End Date 24 April 2024 Northing 194946 Ground Level 325.25mOD Depth 1.40 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft brown slightly gravelly sandy CLAY with frequent roots (up to 5mm diam) and rootlets. Gravel is angular and subangular fine to coarse brick, concrete and sandstone. (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50				Firm light brown slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse brick, concrete and sandstone. (MADE GROUND)	0.40	324.85	
2B 2ES	1.00 - 1.20 1.00 - 1.20				Dark greyish brown clayey very sandy angular to subrounded fine to coarse brick, concrete and sandstone GRAVEL with a medium concrete, brick and tarmacadam cobble content and low concrete boulder content. Rare wire fragments. (MADE GROUND) 1.20m: 20mm diam electricity cable, damaged.	1.00	324.25	
					Trial pit Completed at 1.40m	1.40	323.85	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.00m x 2.50m

Sidewall stability: Spalling in side walls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.40m.

Remarks: Trial pit terminated at 1.40m due to uncovering electricity cable and relocated as TP207A.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP207A

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 01 May 2024 Easting 300022 Scale 1:25

End Date 01 May 2024 Northing 194954 Ground Level 325.85mOD Depth 2.40 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft reddish brown slightly sandy slightly gravelly clayey SILT with frequent roots (up to 5mm diam) and rootlets. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.20	325.65	
1B 1ES	0.50 - 0.70 0.50				Greyish brown clayey sandy angular and subangular fine to coarse sandstone, concrete and brick GRAVEL with a high angular and subangular concrete and brick cobble content and high concrete boulder content. Rare fragments of steel reinforcement bar, wire mesh and polystyrene. (MADE GROUND) 0.40 - 1.10m: Concrete footing in south face of pit			
2B 2ES	1.00 - 1.10 1.00					1.10	324.75	
					Brown clayey sandy angular and subangular fine to coarse sandstone, concrete and brick GRAVEL with a medium angular and subangular sandstone, concrete and brick cobble content. (MADE GROUND)			
3B 3ES	1.50 - 1.70 1.50							
4B 4ES	2.00 - 2.20 2.00							
					2.40m: Concrete across base of pit.	2.40	323.45	
					Trial pit Completed at 2.40m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.50m

Sidewall stability: Spalling in sidewalls.

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.40m.

Remarks: Trial pit terminated at 2.40m on hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP208

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 01 May 2024 Easting 300068 Scale 1:25

End Date 01 May 2024 Northing 194922 Ground Level 319.60mOD Depth 1.10 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark brown slightly sandy slightly gravelly clayey SILT with frequent rootlets. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.20	319.40	
1B 1ES	0.50 - 0.70 0.50				Brown clayey very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium concrete, sandstone and brick cobble content and low concrete boulder content. Rare fragments of metal and plastic pipe. (MADE GROUND) 0.60 - 1.10m: Brickwork structure in north, south and east faces of pit.			
2B 2ES	1.00 - 1.10 1.00				1.10m: Concrete slab across base of pit.	1.10	318.50	
					Trial pit Completed at 1.10m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.40m

Sidewall stability: Spalling in sidewalls.

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.10m.

Remarks: Trial pit terminated at 1.10m on concrete obstruction.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP209

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 01 May 2024 Easting 300319 Scale 1:25

End Date 01 May 2024 Northing 194930 Ground Level 320.85mOD Depth 0.50 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark brown slightly sandy slightly gravelly clayey SILT with frequent rootlets. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.20	320.65	
					Brown clayey very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a low subangular sandstone cobble content. Rare fragments of metal. (MADE GROUND)			
					0.50m: Manhole chamber in base of pit (in situ).	0.50	320.35	
					Trial pit Completed at 0.50m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 0.90m x 2.20m

Sidewall stability: Spalling in sidewalls.

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 0.50m.

Remarks: Trial pit terminated at 0.50m due to manhole chamber in base of pit.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP210

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 23 April 2024 Easting 300482 Scale 1:25

End Date 23 April 2024 Northing 195071 Ground Level 321.25mOD Depth 2.90 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over greyish brown silty very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium angular brick, concrete and sandstone cobble content and low concrete boulder content. Frequent fragments of steel rebar and rare fragments of wood, metal, wire, rags and plastic. (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50				0.00 - 0.50m: Frequent roots (up to 5mm diam) and rootlets.			
2B 2ES	1.00 - 1.20 1.00							
3B 3ES	1.50 - 1.70 1.50							
4B 4ES	2.00 - 2.20 2.00							
5B 5ES	2.50 - 2.70 2.50							
					2.90m: Grey sandstone across base of pit.	2.90	318.35	
					Trial pit Completed at 2.90m			

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.00m x 2.50m

Sidewall stability: Spalling in side walls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.90m.

Remarks: Trial pit terminated at 2.90m due to hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP211

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 29 April 2024 Easting 300554 Scale 1:25

End Date 29 April 2024 Northing 195086 Ground Level 313.75mOD Depth 1.70 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over greyish brown clayey sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a high angular and subangular sandstone, brick and concrete cobble content and low sandstone and concrete boulder content. Rare fragments of plastic and textile rags. (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50				0.50m: Wire rope (20mm diam).			
2B 2ES	1.00 - 1.20 1.00 - 1.20				Brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a high angular tabular sandstone cobble content and low sandstone boulder content.	1.00	312.75	
3D 3ES	1.50 - 1.70 1.50				1.70m: Grey sandstone across base of pit.	1.70	312.05	
					Trial pit Completed at 1.70m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.50m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.70m.

Remarks: Trial pit terminated at 1.70m due to hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

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TRIAL PIT LOG

TP212

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 29 April 2024 Easting 300499 Scale 1:25

End Date 29 April 2024 Northing 195024 Ground Level 313.10mOD Depth 2.20 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over firm reddish brown slightly gravelly sandy silty CLAY with frequent roots (up to 20mm diam) and rootlets. Gravel is angular fine to coarse sandstone. (MADE GROUND)	0.20	312.90	
1B 1ES	0.50 - 0.70 0.50				Brown slightly clayey very sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a medium angular and subangular sandstone, brick and concrete cobble content and low sandstone and concrete boulder content. Rare fragments of plastic and textile rags. (MADE GROUND) 0.20 - 1.00m: Brick wall in west face of pit (in situ).			
2B 2ES	1.00 - 1.20 1.00				1.00 - 1.30m: Concrete footing in west face of pit			
					Brown and grey clayey very sandy angular and subangular fine to coarse sandstone GRAVEL with a high angular tabular sandstone cobble content.	1.30	311.80	
3B 3ES	1.50 - 1.70 1.50							
4B 4ES	2.00 - 2.20 2.00							
					2.20m: Probable sandstone across base of pit.	2.20	310.90	
					Trial pit Completed at 2.20m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.00m x 2.70m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.20m.

Remarks: Trial pit terminated at 2.20m due to hard strata, probable sandstone. Soakaway test undertaken, results presented separately.

AGS

CONTRACT	CHECKED
38113	**JH**

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP213

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 26 April 2024 Easting 300531 Scale 1:25

End Date 26 April 2024 Northing 194963 Ground Level 304.15mOD Depth 3.50 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark brown slightly gravelly sandy silty CLAY with frequent roots (up to 5mm diam) and rootlets. Gravel is angular to subrounded fine to coarse brick and sandstone. (MADE GROUND)	0.10	304.05	
1B 1ES	0.50 - 0.70 0.50				Greyish brown very clayey very sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a medium angular and subangular sandstone, brick and concrete cobble content. (MADE GROUND)			
2B 2ES	1.00 - 1.10 1.00							
					Soft grey and greyish brown slightly sandy gravelly CLAY with a low subangular sandstone cobble content. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	1.10	303.05	
3D 3ES	1.50 1.50							
4D 4ES	2.00 2.00							
5D 5ES	3.00 3.00							
					Trial pit Completed at 3.50m	3.50	300.65	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.20m x 3.00m

Sidewall stability: Sidewall collapse from 3.00m

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 3.50m.

AGS

CONTRACT	CHECKED
38113	**JH**

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP214

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 29 April 2024 Easting 300585 Scale 1:25

End Date 29 April 2024 Northing 195001 Ground Level 304.10mOD Depth 2.90 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft brown slightly gravelly sandy silty CLAY with frequent roots (up to 20mm diam) and rootlets. Gravel is angular and subangular fine to coarse sandstone. (MADE GROUND)	0.20	303.90	
1B 1ES	0.50 - 0.70 0.50				Greyish brown and brown very clayey very sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a medium sandstone, brick and concrete cobble content and low sandstone boulder content. (MADE GROUND)	0.80	303.30	
2B 2ES	1.00 - 1.20 1.00				Dark greyish brown very clayey very sandy angular and subangular fine to coarse sandstone GRAVEL with a medium angular sandstone cobble content. (MADE GROUND)			
3D 3ES	1.50 1.50							
4B 4ES	2.00 - 2.20 2.00							
5B 5ES	2.50 - 2.70 2.50			▼				
				2.50m	Trial pit Completed at 2.90m	2.90	301.20	

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.50m

Sidewall stability: Sidewalls collapsing from 2.50m

Groundwater: Groundwater flow encountered at 2.50m

Backfill: Arisings 0.00 - 2.90m.

Remarks: Trial pit terminated at 2.90m due to sidewall collapse.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP215

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 30 April 2024 Easting 300083 Scale 1:25

End Date 30 April 2024 Northing 194764 Ground Level 304.95mOD Depth 0.70 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft greyish brown slightly sandy gravelly silty CLAY with a low subangular sandstone cobble content and frequent rootlets. Gravel is angular and subangular fine to coarse sandstone, brick and concrete. (MADE GROUND)			
1B 1ES	0.50 - 0.70 0.50							
					0.70m: Top of yellow plastic 100mm diameter gas main orientated approx east-west across centre of pit.	0.70	304.25	
					Trial pit Completed at 0.70m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.00m x 2.20m

Sidewall stability: Minor spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 0.70m.

Remarks: Trial pit terminated at 0.70m due to encountering gas main.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP216

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 30 April 2024 Easting 300240 Scale 1:25

End Date 30 April 2024 Northing 194840 Ground Level 307.05mOD Depth 2.00 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark greyish brown slightly gravelly sandy clayey SILT with frequent roots (up to 20mm diam) and rootlets. Gravel is angular and subangular fine to coarse sandstone, brick and concrete. (MADE GROUND)			
					Greyish brown clayey very sandy angular and subangular fine to coarse sandstone, brick and concrete GRAVEL with a medium subangular sandstone, brick and concrete cobble content and low sandstone and concrete boulder content. (MADE GROUND)	0.30	306.75	
1B 1ES	0.50 - 0.70 0.50							
2B 2ES	1.00 - 1.20 1.00							
					Brown clayey sandy angular and subangular fine to coarse sandstone GRAVEL with a high subangular sandstone cobble content and low sandstone boulder content. (MADE GROUND)	1.20	305.85	
3D 3ES	1.50 1.50							
					2.00m: Probable sandstone across base of pit.	2.00	305.05	
					Trial pit Completed at 2.00m			

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.10m x 2.40m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.00m.

Remarks: Trial pit terminated at 2.00m due hard strata, probable sandstone. Soakaway test undertaken, results presented separately.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP217

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 25 April 2024 Easting 300244 Scale 1:25

End Date 25 April 2024 Northing 194800 Ground Level 302.15mOD Depth 2.90 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark brown slightly sandy slightly gravelly silty CLAY with frequent roots (up to 5mm dam) and rootlets. Gravel is subangular and subrounded fine to coarse sandstone. (MADE GROUND)	0.10	302.05	
1B 1ES	0.50 - 0.70 0.50				Brown very clayey very sandy angular and subangular fine to coarse brick, concrete and sandstone GRAVEL with a medium angular and subangular brick, concrete and sandstone cobble content and medium concrete boulder content. (MADE GROUND) 0.20 - 0.70m: Grey brickwork in south and west face of pit (in situ). 0.70 - 1.00m: Concrete footing in west face of pit.			
2B 2ES	1.00 - 1.20 1.00				1.20 - 1.50m: Concrete footing in south face of pit.			
3B 3ES	1.50 - 1.70 1.50 - 1.70				Dark brown silty very sandy angular and subangular fine to coarse sandstone GRAVEL with a medium subangular sandstone cobble content and low subangular sandstone boulder content. (MADE GROUND)	1.50	300.65	
4B 4ES	2.00 - 2.20 2.00							
5B 5ES	2.50 - 2.70 2.50							
					2.90m: Grey sandstone across base of pit. Trial pit Completed at 2.90m	2.90	299.25	

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 1.10m x 2.70m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 2.90m.

Remarks: Trial pit terminated at 2.90m on hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP218

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 07 May 2024 Easting 300270 Scale 1:25

End Date 07 May 2024 Northing 194509 Ground Level 284.50mOD Depth 1.30 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft friable brown slightly sandy slightly gravelly clayey SILT with frequent rootlets. Gravel is angular and subangular fine to coarse sandstone.			
						0.30	284.20	
1B 1ES	0.50 - 0.70 0.50				Medium strong brown fine and medium SANDSTONE recovered as angular and subangular tabular sandstone cobbles with a low tabular sandstone boulder content with much slightly sandy angular and subangular fine to coarse sandstone gravel.			
2B 2ES	1.00 - 1.20 1.00							
					Trial pit Completed at 1.30m	1.30	283.20	

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 0.90m x 2.00m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.30m.

Remarks: Trial pit terminated at 1.30m on hard strata.

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP219

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 07 May 2024 Easting 300264 Scale 1:25

End Date 07 May 2024 Northing 194585 Ground Level 285.75mOD Depth 1.30 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over stiff friable brown slightly sandy slightly gravelly clayey SILT with frequent roots (up to 5mm diam) and rootlets. Gravel is angular and subangular fine to coarse sandstone.			
					Medium strong brown fine and medium SANDSTONE recovered as angular and subangular tabular sandstone cobbles with a low tabular sandstone boulder content with much clayey sandy angular and subangular fine to coarse sandstone gravel.	0.30	285.45	
1B 1ES	0.50 - 0.70 0.50							
2B 2ES	1.00 - 1.20 1.00							
					1.30m: Brown sandstone across base of pit. Trial pit Completed at 1.30m	1.30	284.45	

Equipment: Pit excavated by CAT308-07 9T Tracked Excavator

Pit width x length: 1.00m x 2.00m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 1.30m.

Remarks: Trial pit terminated at 1.30m on hard strata. Soakaway test undertaken, results presented separately.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

TRIAL PIT LOG

TP220

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Sheet 1 of 1

Start Date 25 April 2024 Easting 300352 Scale 1:25

End Date 25 April 2024 Northing 194442 Ground Level 285.85mOD Depth 0.75 m

sample no & type	sample depth (m) from	to	test type & value	water record	description	depth (m)	reduced level (m)	legend
					Grass over soft dark brown sandy clayey SILT with frequent roots (up to 10mm diam) and rootlets.			
					Medium strong brown fine and medium SANDSTONE with rare rootlets recovered as angular and subangular tabular sandstone cobbles with a low tabular sandstone boulder content with much clayey very sandy angular and subangular fine to coarse sandstone gravel.	0.20	285.65	
1B 1ES	0.50 - 0.70 0.50				0.75m: Grey sandstone across base of pit.	0.75	285.10	
					Trial pit Completed at 0.75m			

Equipment: Pit excavated by Volvo EWR130E 14T Wheeled Excavator

Pit width x length: 0.90m x 2.00m

Sidewall stability: Spalling in sidewalls

Groundwater: Groundwater not encountered

Backfill: Arisings 0.00 - 0.75m.

Remarks: Trial pit terminated at 0.75m on hard strata.

AGS

CONTRACT	CHECKED
38113	JH

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

Geotechnical Engineering Limited

SOAKAWAY TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNONTAFF TRIAL PIT **TP201**

DATE 24/04/2024

TEST 1

LENGTH	2.70 m
BREADTH	1.10 m
DEPTH	3.00 m
WATER LEVEL	Dry m
FILL LEVEL	2.14 m

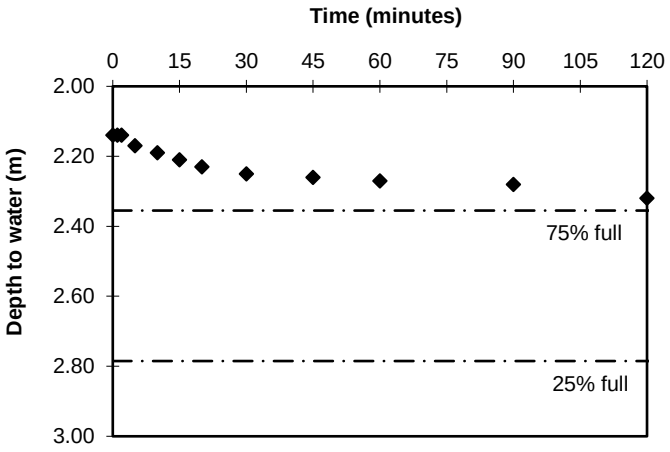
v_{p75-25}

a_{p50}

t_{p75-25}

soil infiltration rate, *f*

Insufficient water take to calculate infiltration rate.



TEST 2

LENGTH	2.70 m
BREADTH	1.10 m
DEPTH	3.00 m
WATER LEVEL	2.32 m
FILL LEVEL	1.81 m

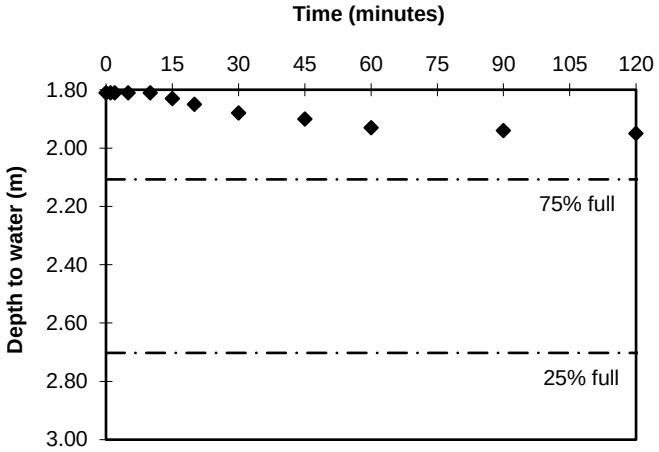
v_{p75-25}

a_{p50}

t_{p75-25}

soil infiltration rate, *f*

Insufficient water take to calculate infiltration rate.



TEST 3

LENGTH	2.70 m
BREADTH	1.10 m
DEPTH	3.00 m
WATER LEVEL	1.95 m
FILL LEVEL	1.53 m

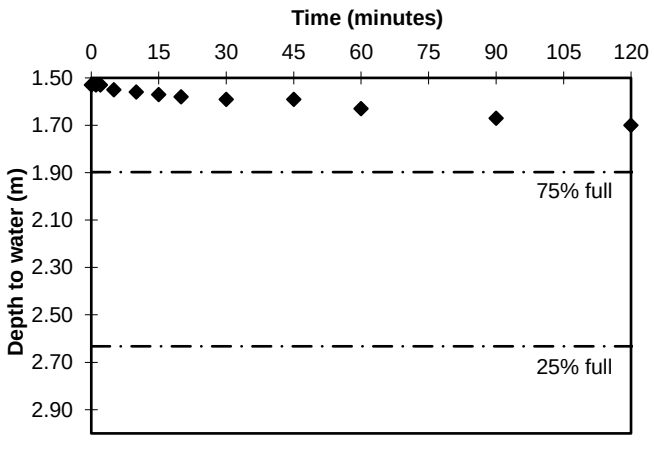
v_{p75-25}

a_{p50}

t_{p75-25}

soil infiltration rate, *f*

Insufficient water take to calculate infiltration rate.



Remarks Test carried out in accordance with BRE DG 365 (2016).

CONTRACT	CHECKED
38113	**JH**

JT / SP

Geotechnical Engineering Limited

SOAKAWAY TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNONTAFF TRIAL PIT **TP204**

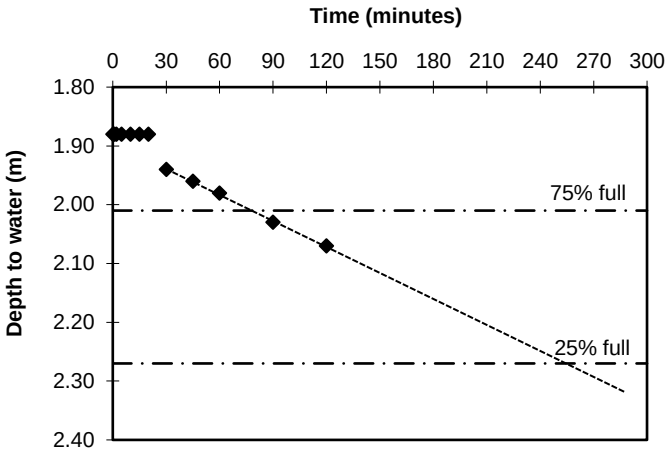
DATE 23/04/2024

TEST 1

LENGTH	2.20	m
BREADTH	1.00	m
DEPTH	2.40	m
WATER LEVEL	Dry	m
FILL LEVEL	1.88	m
v_{p75-25}	0.572	m^3
a_{p50}	3.864	m^2
t_{p75-25}	183	min

soil infiltration rate, *f* **3.3×10^{-5} ms^{-1}**

Calculated by extrapolating timeline

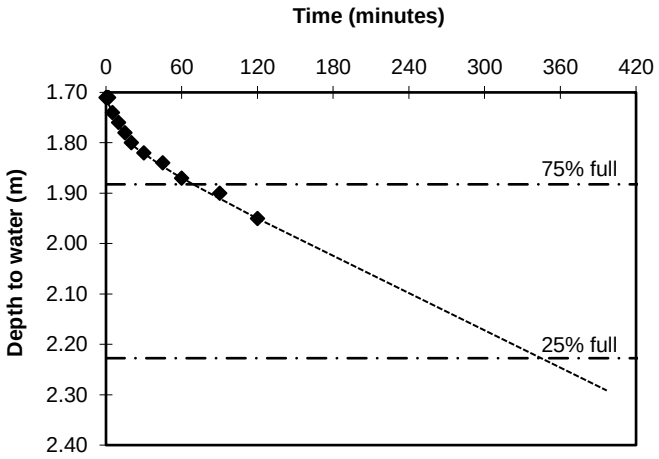


TEST 2

LENGTH	2.20	m
BREADTH	1.00	m
DEPTH	2.40	m
WATER LEVEL	2.07	m
FILL LEVEL	1.71	m
v_{p75-25}	0.759	m^3
a_{p50}	4.408	m^2
t_{p75-25}	276	min

soil infiltration rate, *f* **1.0×10^{-5} ms^{-1}**

Calculated by extrapolating timeline



TEST 3

LENGTH

BREADTH

DEPTH

WATER LEVEL

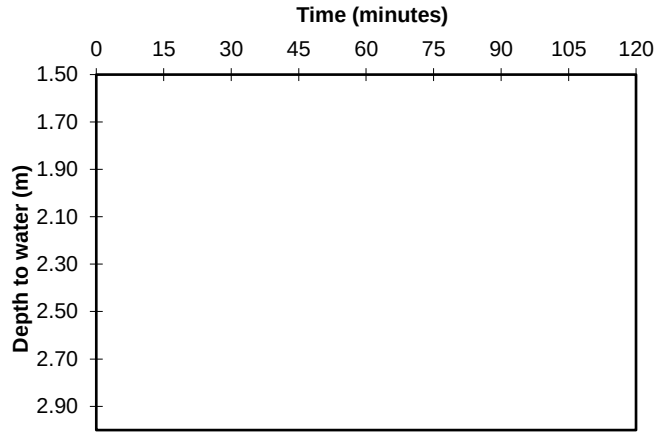
FILL LEVEL

v_{p75-25}

a_{p50}

t_{p75-25}

soil infiltration rate, *f*



Remarks Test carried out in accordance with BRE DG 365 (2016).

CONTRACT	CHECKED
38113	**JH**

JT / SP

Geotechnical Engineering Limited

SOAKAWAY TEST

CLIENT TRIVALLIS

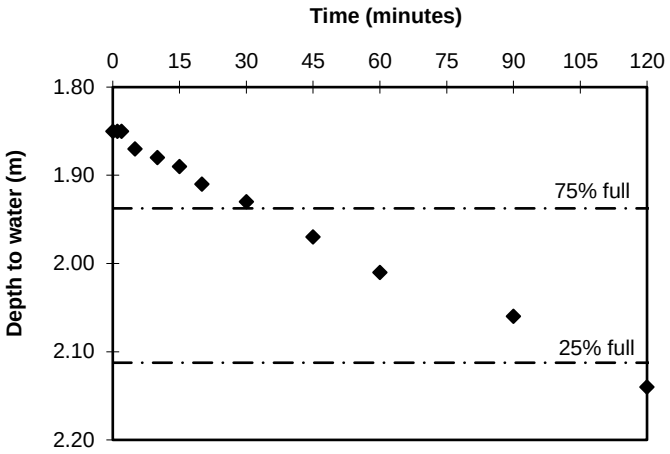
SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF TRIAL PIT **TP212**

DATE 29/04/2024

TEST 1

LENGTH	2.10	m
BREADTH	1.00	m
DEPTH	2.20	m
WATER LEVEL	Dry	m
FILL LEVEL	1.85	m
v_{p75-25}	0.368	m^3
a_{p50}	3.185	m^2
t_{p75-25}	77	min

soil infiltration rate, *f* **2.5×10^{-5} ms^{-1}**

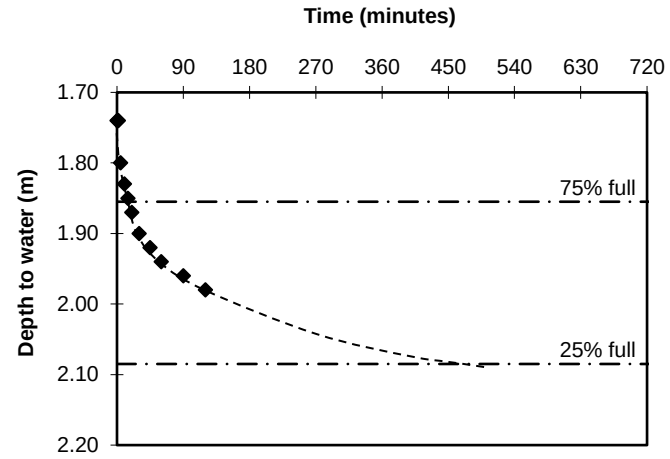


TEST 2

LENGTH	2.10	m
BREADTH	1.00	m
DEPTH	2.20	m
WATER LEVEL	2.14	m
FILL LEVEL	1.74	m
v_{p75-25}	0.483	m^3
a_{p50}	3.526	m^2
t_{p75-25}	435	min

soil infiltration rate, *f* **5.3×10^{-6} ms^{-1}**

Calculated by extrapolating timeline

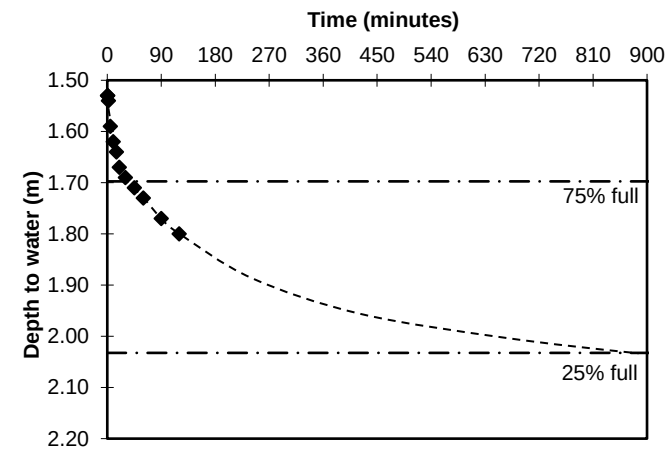


TEST 3

LENGTH	2.10	m
BREADTH	1.00	m
DEPTH	2.20	m
WATER LEVEL	1.98	m
FILL LEVEL	1.53	m
v_{p75-25}	0.704	m^3
a_{p50}	4.177	m^2
t_{p75-25}	845	min

soil infiltration rate, *f* **3.3×10^{-6} ms^{-1}**

Calculated by extrapolating timeline



Remarks Test carried out in accordance with BRE DG 365 (2016).

CONTRACT	CHECKED
38113	**JH**

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rev08 22/08/16 JH

Geotechnical Engineering Limited

SOAKAWAY TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF TRIAL PIT **TP216**

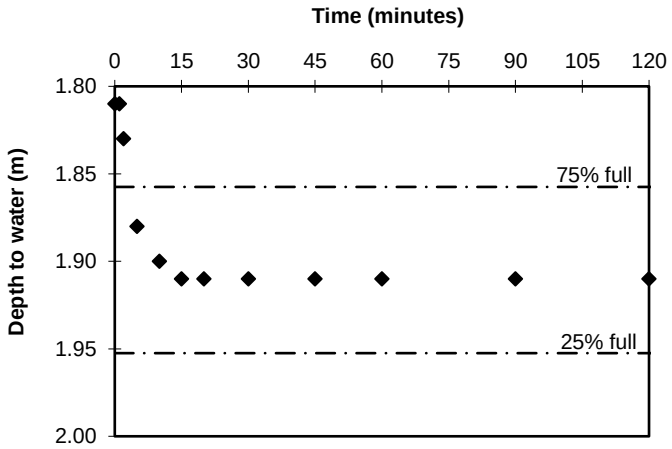
DATE 30/04/2024

TEST 1

LENGTH	2.00	m
BREADTH	1.10	m
DEPTH	2.00	m
WATER LEVEL	Dry	m
FILL LEVEL	1.81	m
v_{p75-25}		
a_{p50}		
t_{p75-25}		

soil infiltration rate, *f*

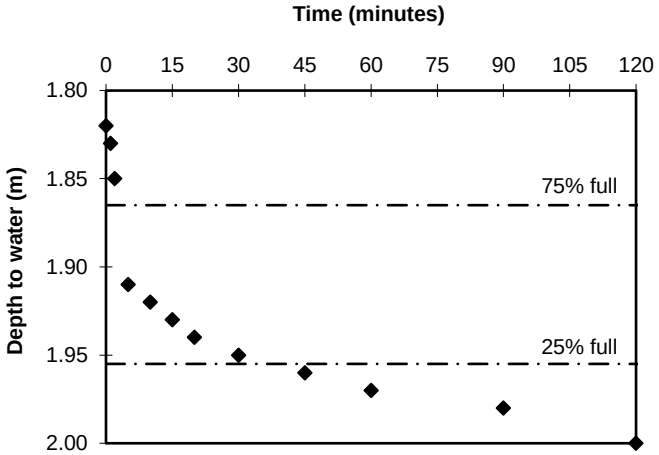
Insufficient water take to calculate infiltration rate



TEST 2

LENGTH	2.00	m
BREADTH	1.10	m
DEPTH	2.00	m
WATER LEVEL	1.91	m
FILL LEVEL	1.82	m
v_{p75-25}	0.198	m^3
a_{p50}	2.758	m^2
t_{p75-25}	34	min

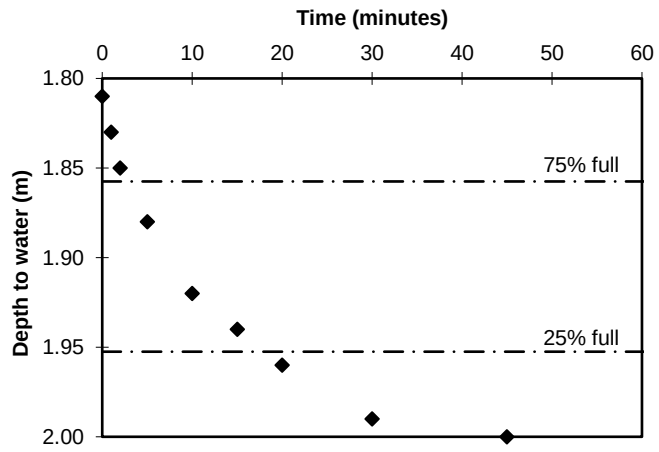
soil infiltration rate, *f* **3.5×10^{-5} ms^{-1}**



TEST 3

LENGTH	2.00	m
BREADTH	1.10	m
DEPTH	2.00	m
WATER LEVEL	Dry	m
FILL LEVEL	1.81	m
v_{p75-25}	0.209	m^3
a_{p50}	2.789	m^2
t_{p75-25}	15	min

soil infiltration rate, *f* **8.3×10^{-5} ms^{-1}**



Remarks Test carried out in accordance with BRE DG 365 (2016).

CONTRACT	CHECKED
38113	**JH**

JT / SP

Geotechnical Engineering Limited

SOAKAWAY TEST

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF TRIAL PIT **TP219**

DATE 07/05/2024

TEST 1

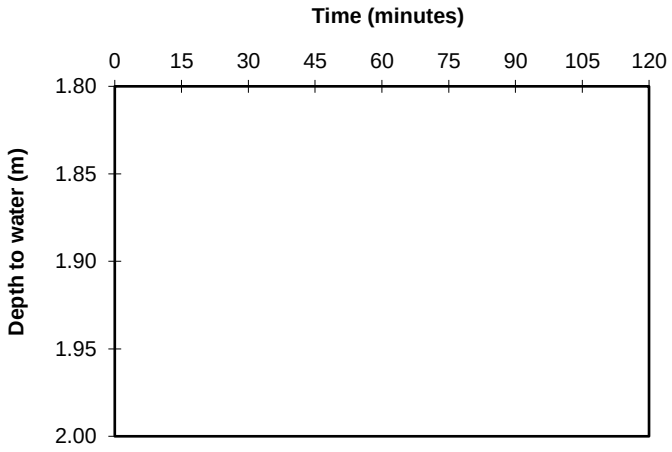
LENGTH	2.00	m
BREADTH	1.00	m
DEPTH	1.30	m
WATER LEVEL	Dry	m
FILL LEVEL		m

v_{p75-25}

a_{p50}

t_{p75-25}

Water take too quick to fill pit. 1000l added



TEST 2

LENGTH

BREADTH

DEPTH

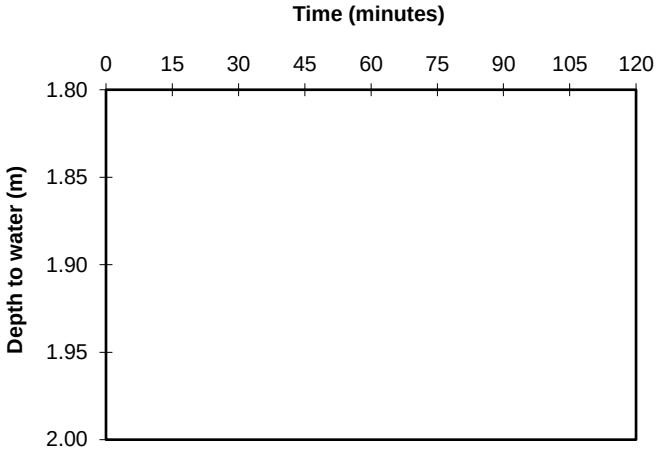
WATER LEVEL

FILL LEVEL

v_{p75-25}

a_{p50}

t_{p75-25}



TEST 3

LENGTH

BREADTH

DEPTH

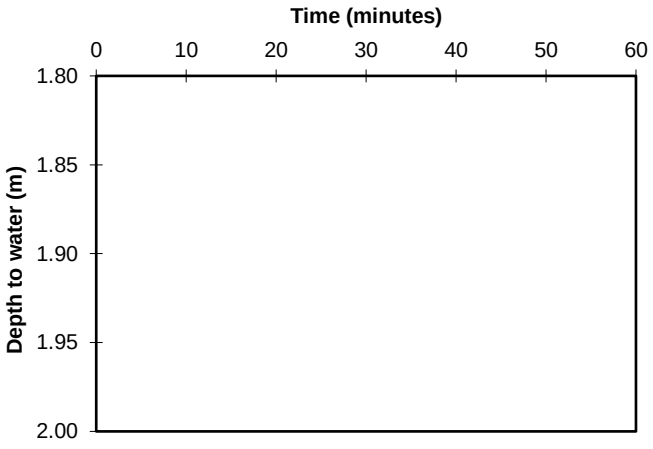
WATER LEVEL

FILL LEVEL

v_{p75-25}

a_{p50}

t_{p75-25}



Remarks Test carried out in accordance with BRE DG 365 (2016).

CONTRACT	CHECKED
38113	**JH**

JT / SP

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP201

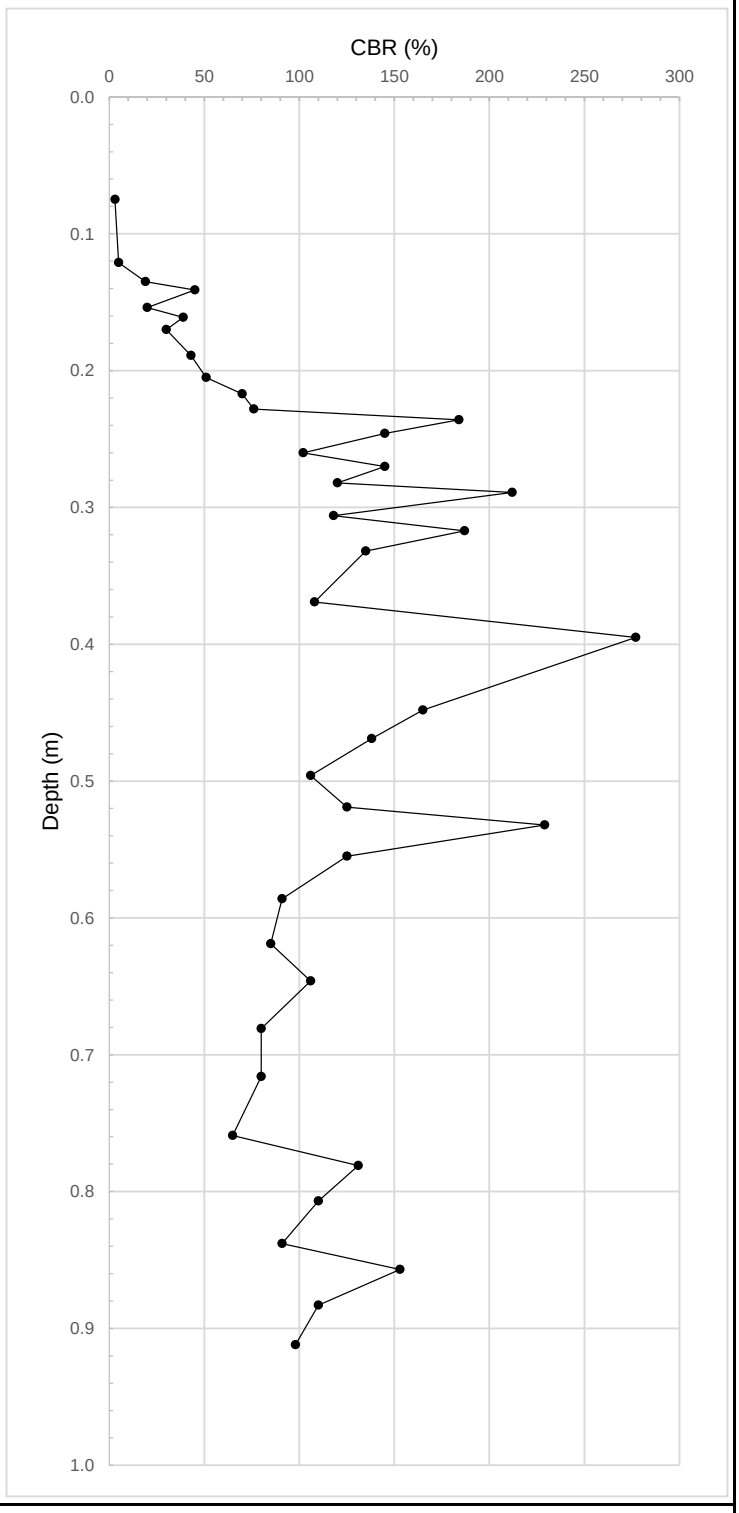
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 26/04/2024 Test No. 1

Initial Scale Reading (mm) 97 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	172	75	0.08	75	3
1	218	46	0.12	46	5
1	232	14	0.14	14	19
1	238	6	0.14	6	45
1	251	13	0.15	13	20
1	258	7	0.16	7	39
1	267	9	0.17	9	30
3	286	19	0.19	6	43
3	302	16	0.21	5	51
3	314	12	0.22	4	70
3	325	11	0.23	4	76
5	333	8	0.24	2	184
5	343	10	0.25	2	145
5	357	14	0.26	3	102
5	367	10	0.27	2	145
5	379	12	0.28	2	120
5	386	7	0.29	1	212
7	403	17	0.31	2	118
7	414	11	0.32	2	187
7	429	15	0.33	2	135
14	466	37	0.37	3	108
24	492	26	0.40	1	277
30	545	53	0.45	2	165
10	566	21	0.47	2	138
10	593	27	0.50	3	106
10	616	23	0.52	2	125
10	629	13	0.53	1	229
10	652	23	0.56	2	125
10	683	31	0.59	3	91
10	716	33	0.62	3	85
10	743	27	0.65	3	106
10	778	35	0.68	4	80
10	813	35	0.72	4	80
10	856	43	0.76	4	65
10	878	22	0.78	2	131
10	904	26	0.81	3	110
10	935	31	0.84	3	91
10	954	19	0.86	2	153
10	980	26	0.88	3	110
10	1009	29	0.91	3	98



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP202

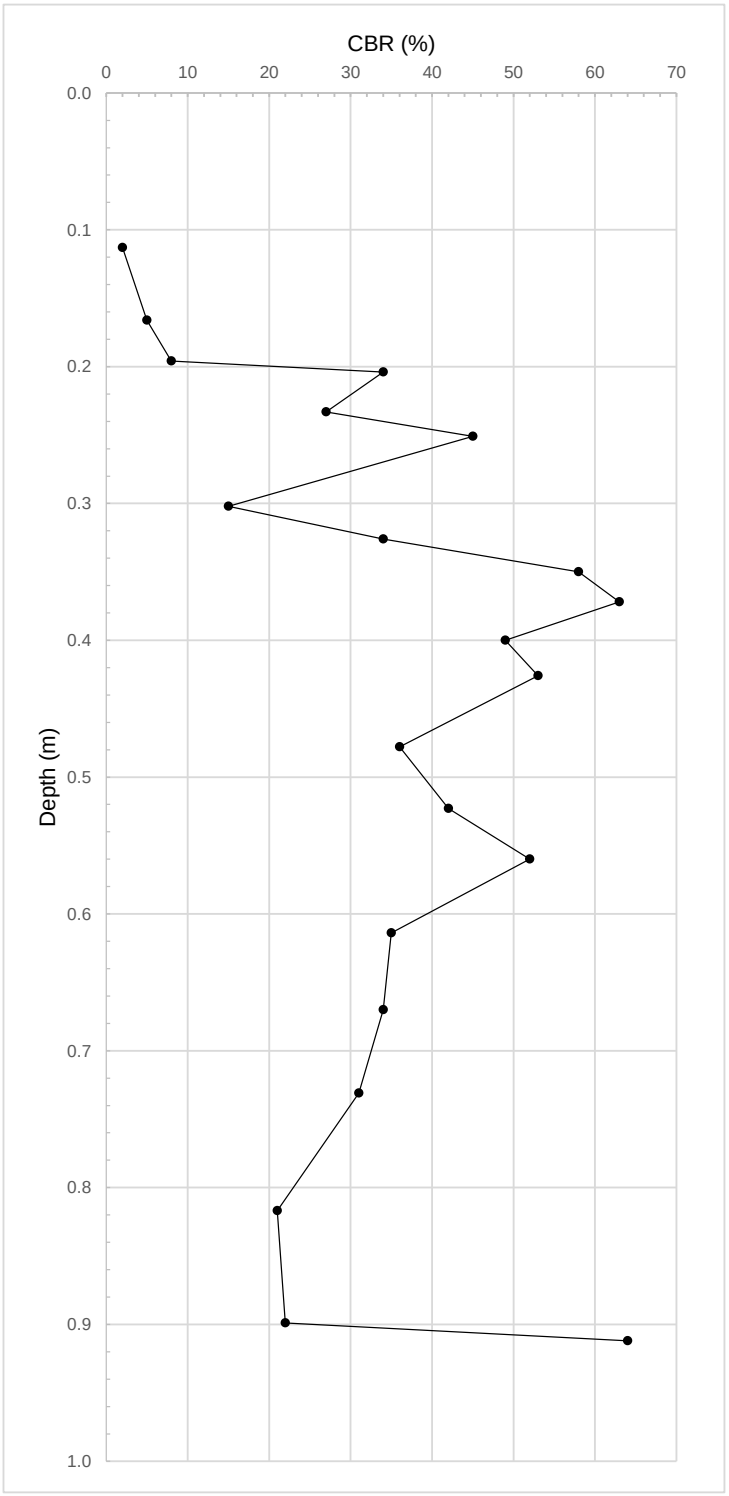
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 26/04/2024 Test No. 1

Initial Scale Reading (mm) 131 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	244	113	0.11	113	2
1	297	53	0.17	53	5
1	327	30	0.20	30	8
1	335	8	0.20	8	34
3	364	29	0.23	10	27
3	382	18	0.25	6	45
3	433	51	0.30	17	15
3	457	24	0.33	8	34
5	481	24	0.35	5	58
5	503	22	0.37	4	63
5	531	28	0.40	6	49
5	557	26	0.43	5	53
7	609	52	0.48	7	36
7	654	45	0.52	6	42
7	691	37	0.56	5	52
7	745	54	0.61	8	35
7	801	56	0.67	8	34
7	862	61	0.73	9	31
7	948	86	0.82	12	21
7	1030	82	0.90	12	22
3	1043	13	0.91	4	64



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

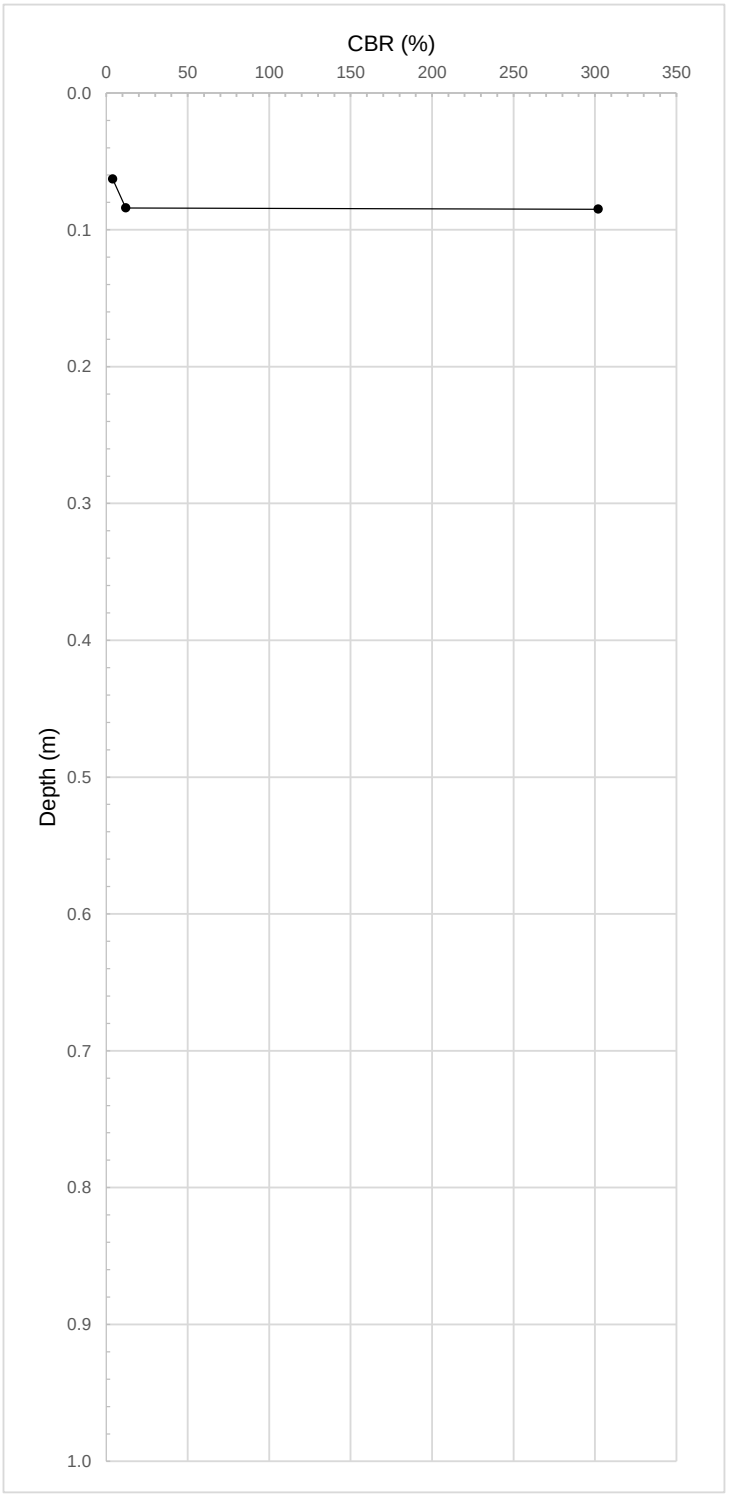
DCP204

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	26/04/2024	Test No.	1
Initial Scale Reading (mm)	125	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	188	63	0.06	63	4
1	209	21	0.08	21	12
1	210	1	0.09	1	302



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP204 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

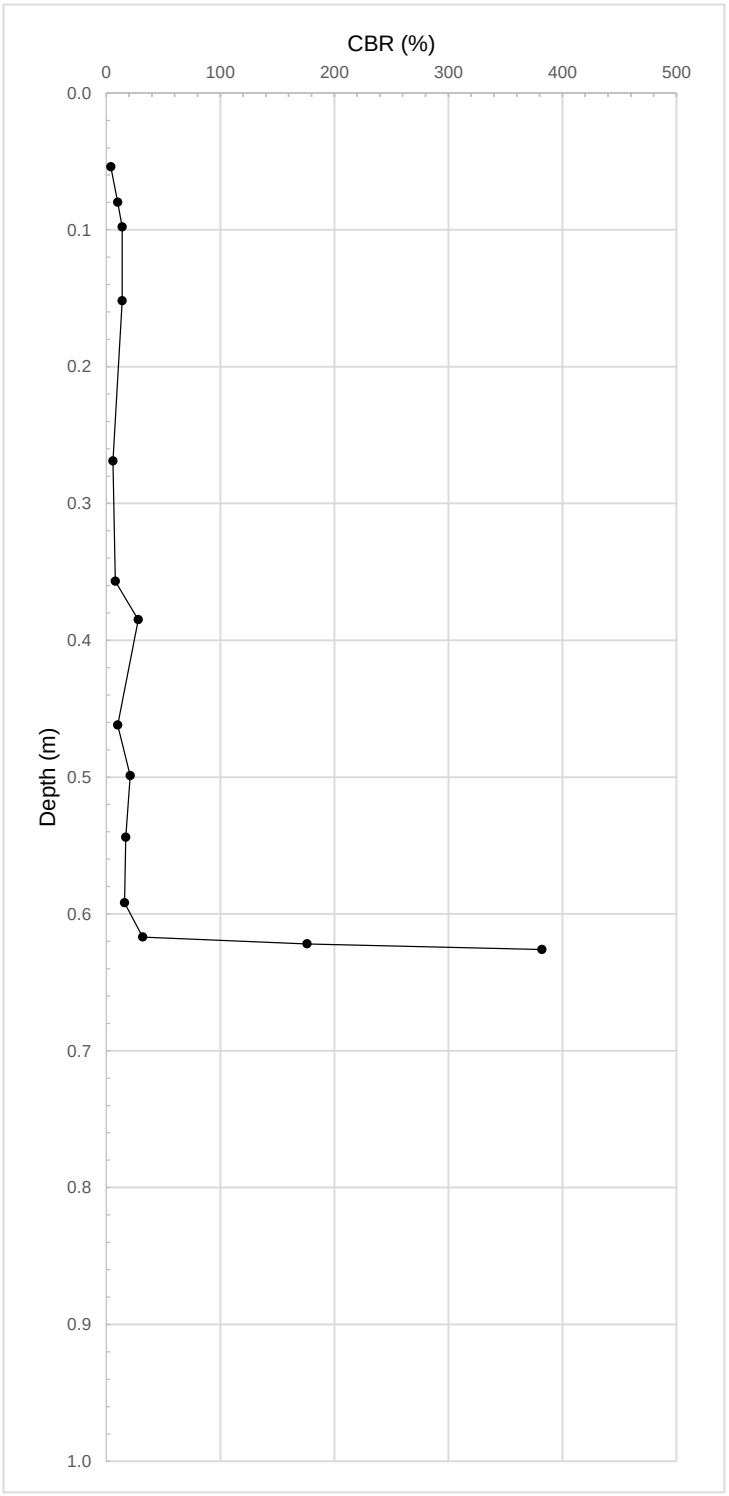
DCP204

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	26/04/2024	Test No.	2
Initial Scale Reading (mm)	125	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	179	54	0.05	54	4
1	205	26	0.08	26	10
1	223	18	0.10	18	14
3	277	54	0.15	18	14
3	394	117	0.27	39	6
3	482	88	0.36	29	8
3	510	28	0.39	9	28
3	587	77	0.46	26	10
3	624	37	0.50	12	21
3	669	45	0.54	15	17
3	717	48	0.59	16	16
3	742	25	0.62	8	32
3	747	5	0.62	2	176
5	751	4	0.63	1	382



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

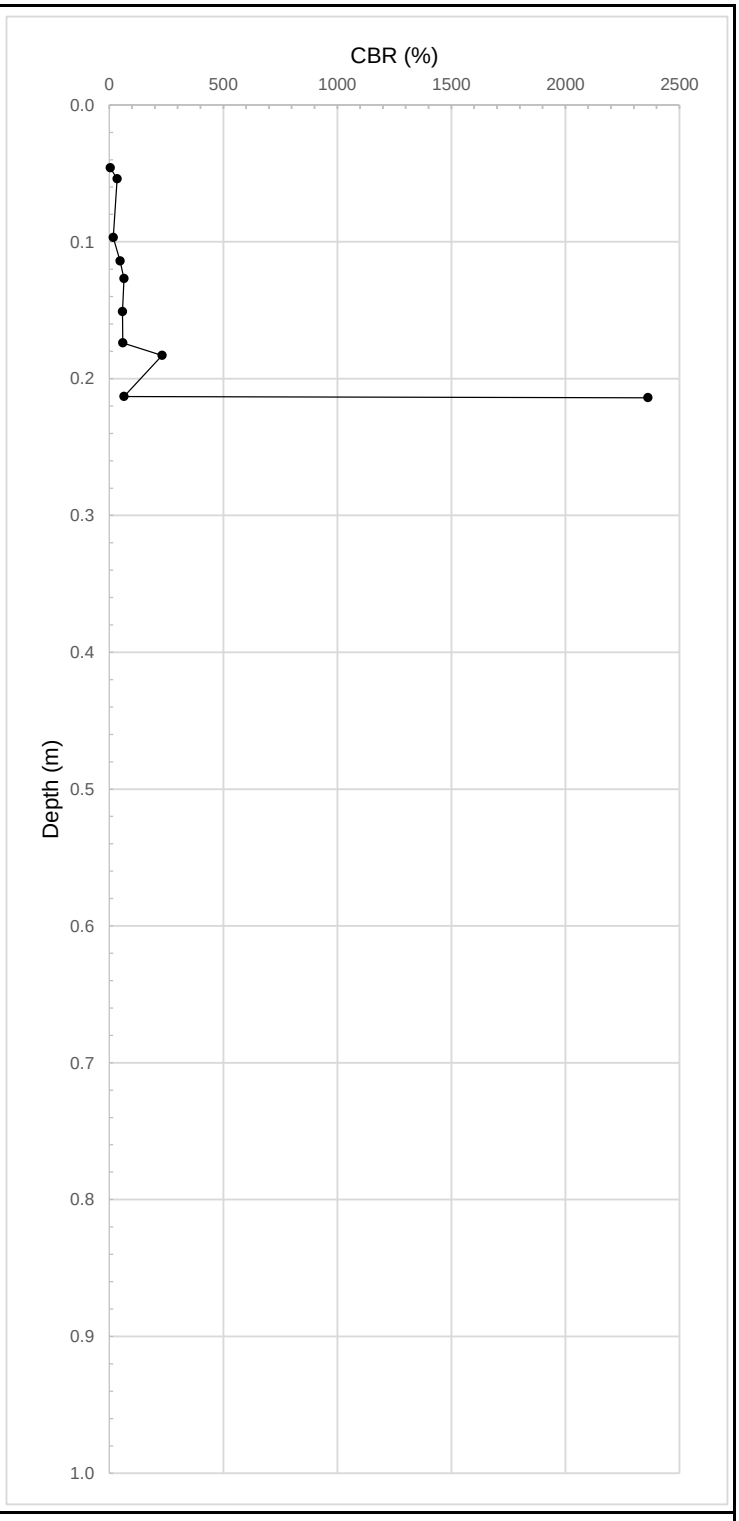
DCP205

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	26/04/2024	Test No.	1
Initial Scale Reading (mm)	108	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	154	46	0.05	46	5
1	162	8	0.05	8	34
3	205	43	0.10	14	18
3	222	17	0.11	6	48
3	235	13	0.13	4	64
5	259	24	0.15	5	58
5	282	23	0.17	5	60
7	291	9	0.18	1	232
7	321	30	0.21	4	65
7	322	1	0.21	0	2362



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP205 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

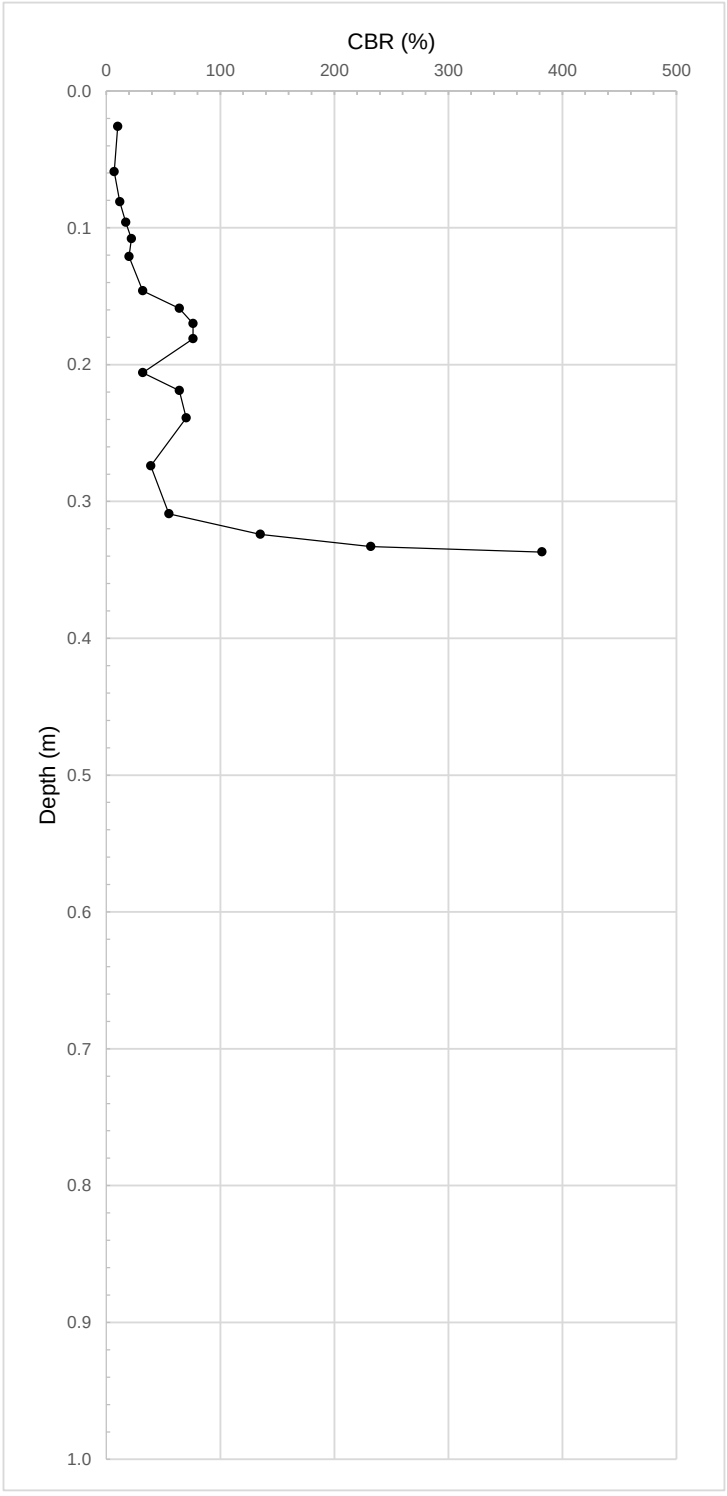
DCP205

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	26/04/2024	Test No.	2
Initial Scale Reading (mm)	113	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	139	26	0.03	26	10
1	172	33	0.06	33	7
1	194	22	0.08	22	12
1	209	15	0.10	15	17
1	221	12	0.11	12	22
1	234	13	0.12	13	20
3	259	25	0.15	8	32
3	272	13	0.16	4	64
3	283	11	0.17	4	76
3	294	11	0.18	4	76
3	319	25	0.21	8	32
3	332	13	0.22	4	64
5	352	20	0.24	4	70
5	387	35	0.27	7	39
7	422	35	0.31	5	55
7	437	15	0.32	2	135
7	446	9	0.33	1	232
5	450	4	0.34	1	382



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP206

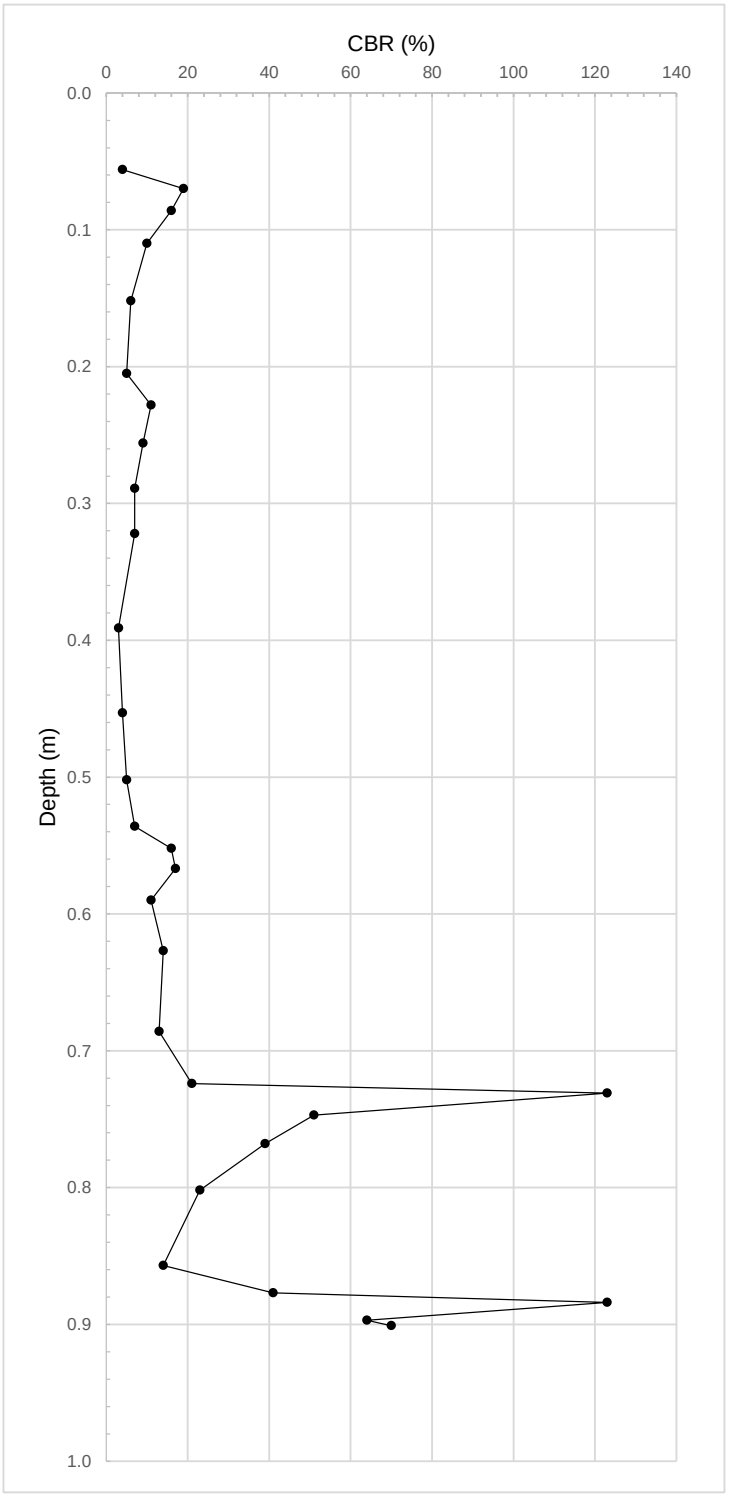
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 106 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	162	56	0.06	56	4
1	176	14	0.07	14	19
1	192	16	0.09	16	16
1	216	24	0.11	24	10
1	258	42	0.15	42	6
1	311	53	0.21	53	5
1	334	23	0.23	23	11
1	362	28	0.26	28	9
1	395	33	0.29	33	7
1	428	33	0.32	33	7
1	497	69	0.39	69	3
1	559	62	0.45	62	4
1	608	49	0.50	49	5
1	642	34	0.54	34	7
1	658	16	0.55	16	16
1	673	15	0.57	15	17
1	696	23	0.59	23	11
2	733	37	0.63	19	14
3	792	59	0.69	20	13
3	830	38	0.72	13	21
3	837	7	0.73	2	123
3	853	16	0.75	5	51
3	874	21	0.77	7	39
3	908	34	0.80	11	23
3	963	55	0.86	18	14
3	983	20	0.88	7	41
3	990	7	0.88	2	123
3	1003	13	0.90	4	64
1	1007	4	0.90	4	70



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP207

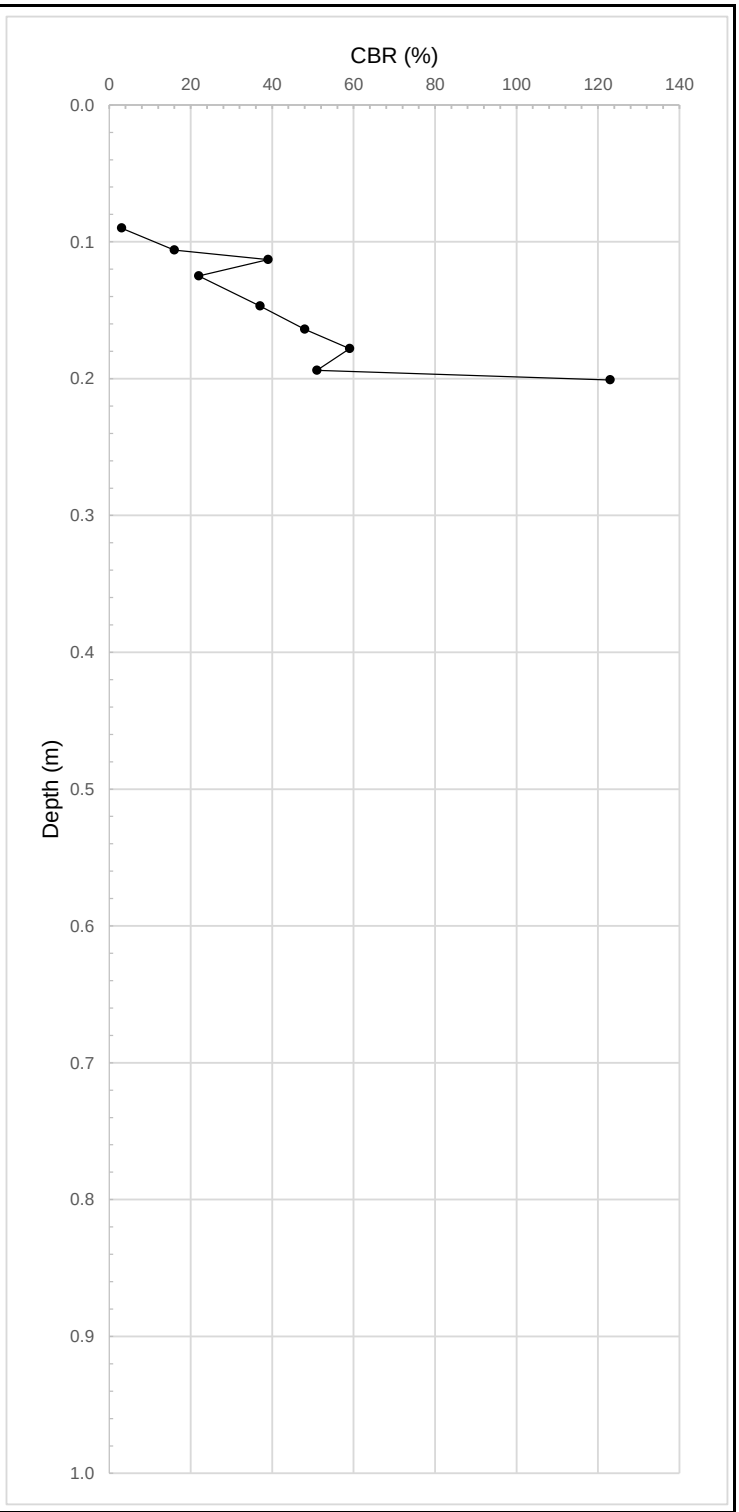
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 117 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	207	90	0.09	90	3
1	223	16	0.11	16	16
1	230	7	0.11	7	39
1	242	12	0.13	12	22
3	264	22	0.15	7	37
3	281	17	0.16	6	48
3	295	14	0.18	5	59
3	311	16	0.19	5	51
3	318	7	0.20	2	123



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP207 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP207

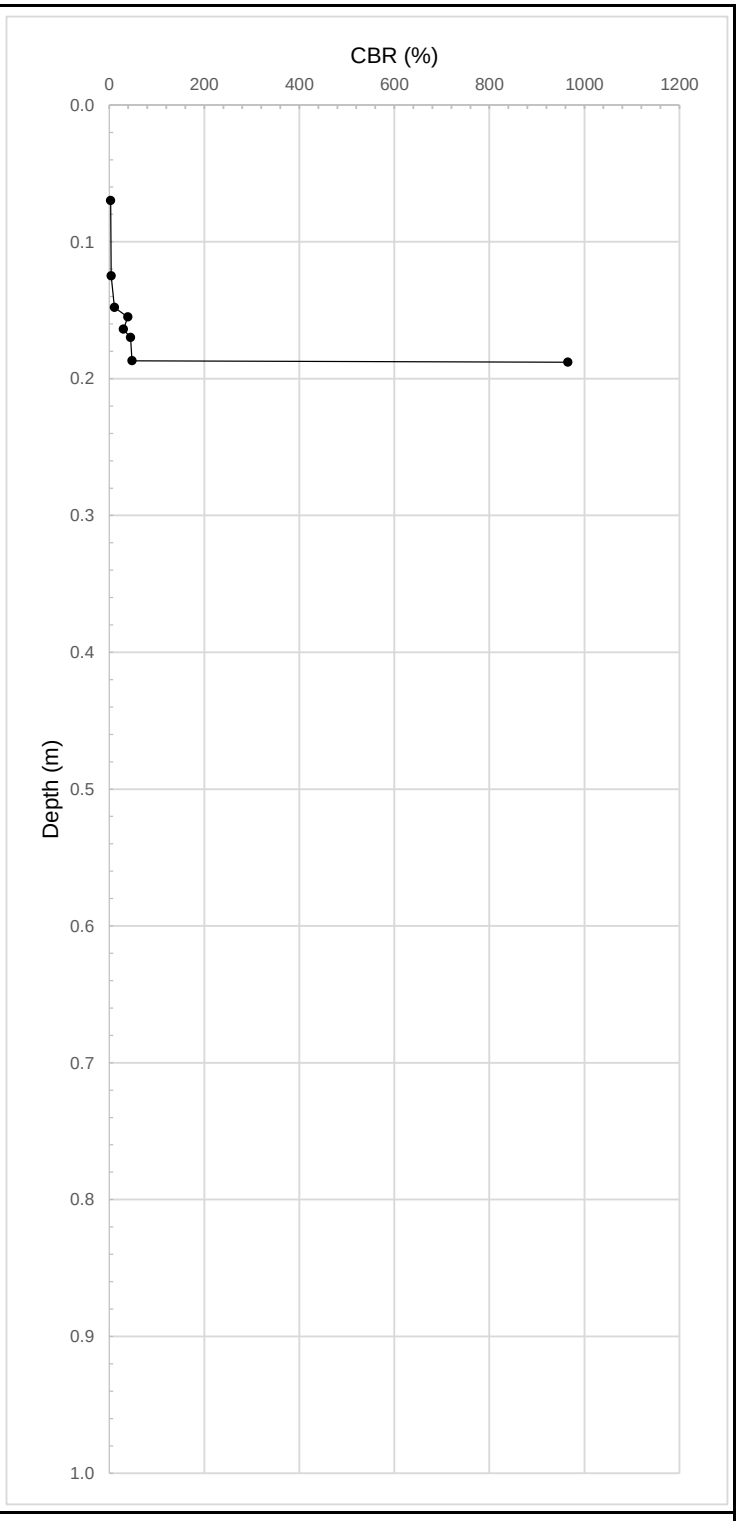
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 2

Initial Scale Reading (mm) 114 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	184	70	0.07	70	3
1	239	55	0.13	55	4
1	262	23	0.15	23	11
1	269	7	0.16	7	39
1	278	9	0.16	9	30
1	284	6	0.17	6	45
3	301	17	0.19	6	48
3	302	1	0.19	0	965



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

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DYNAMIC CONE PENETROMETER TESTING

DCP208

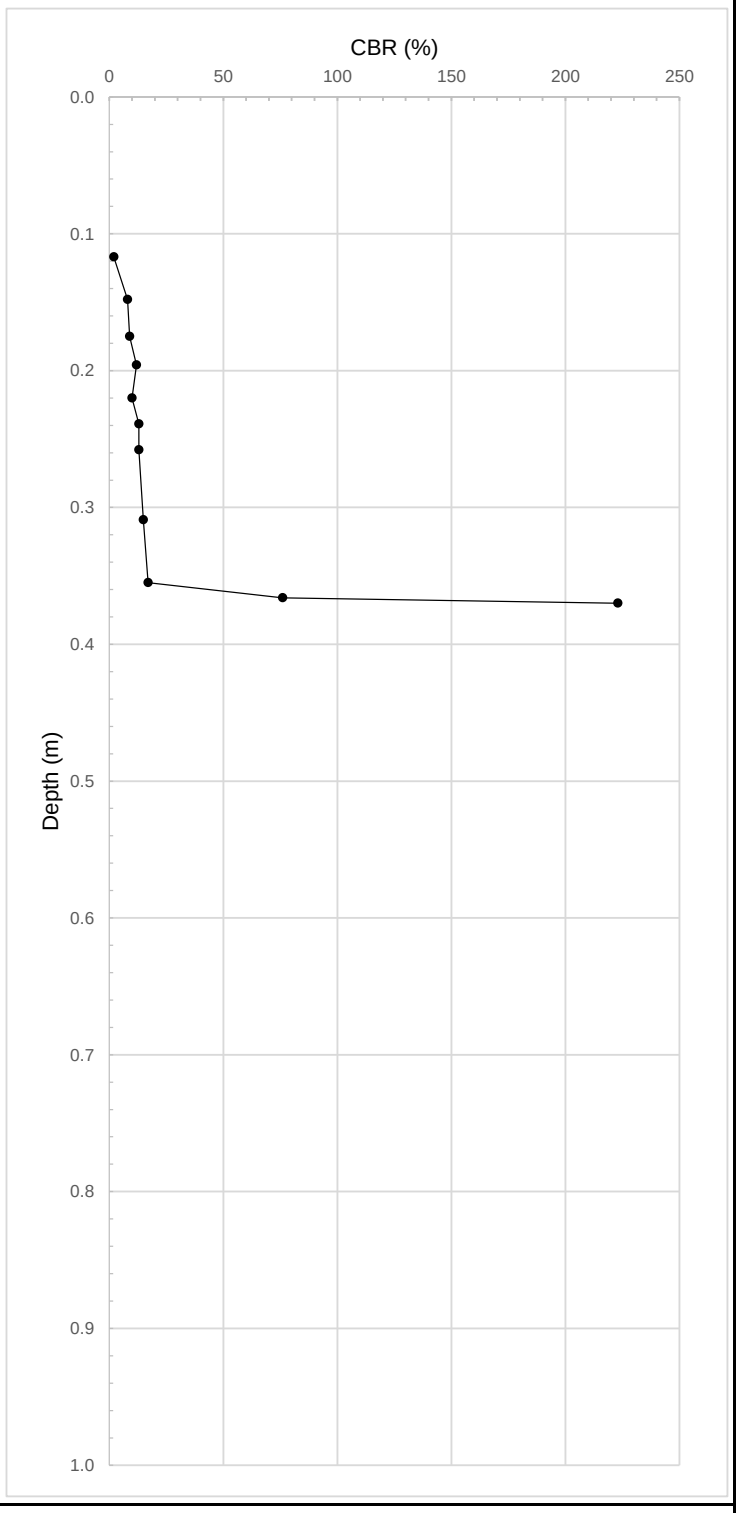
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 127 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	244	117	0.12	117	2
1	275	31	0.15	31	8
1	302	27	0.18	27	9
1	323	21	0.20	21	12
1	347	24	0.22	24	10
1	366	19	0.24	19	13
1	385	19	0.26	19	13
3	436	51	0.31	17	15
3	482	46	0.36	15	17
3	493	11	0.37	4	76
3	497	4	0.37	1	223



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP208 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

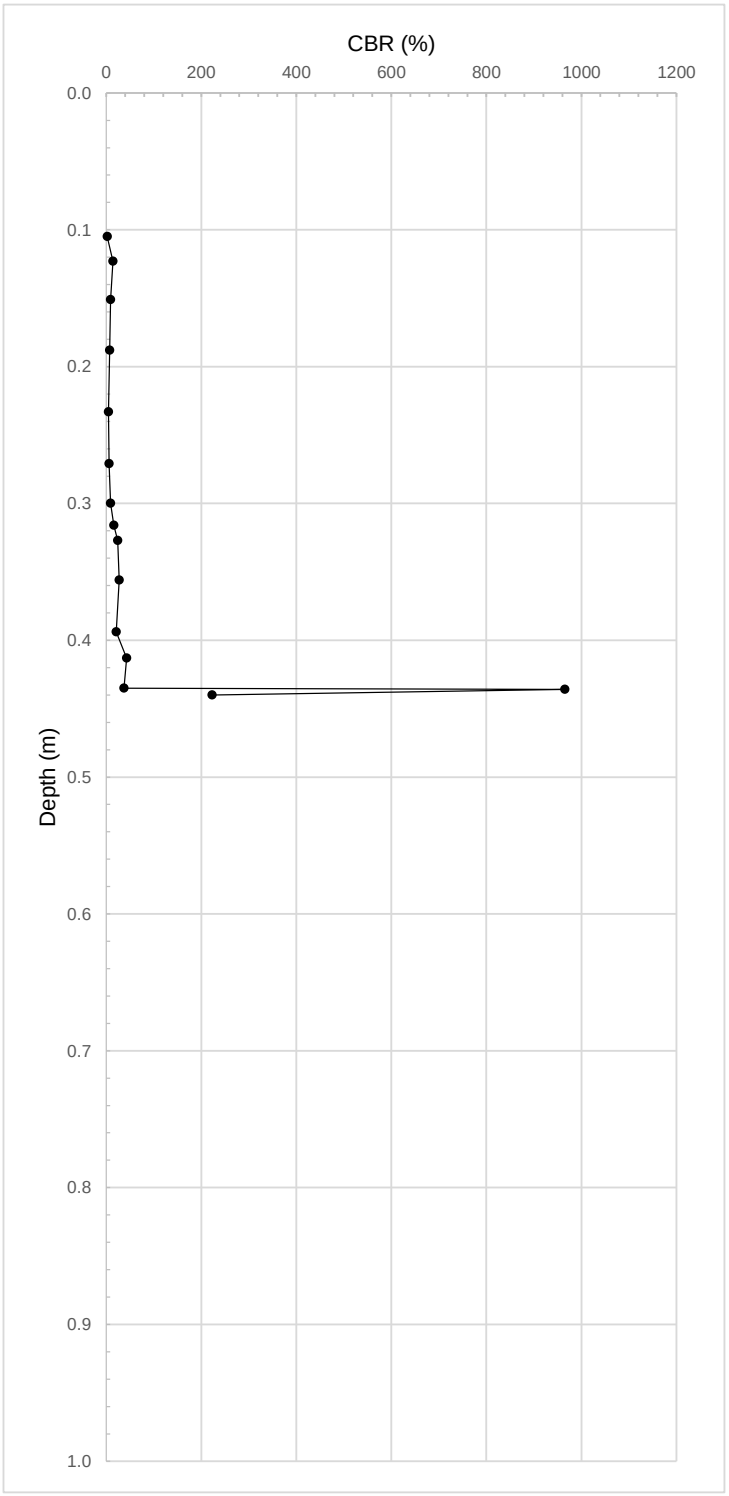
DCP208

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	131	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	236	105	0.11	105	2
1	254	18	0.12	18	14
1	282	28	0.15	28	9
1	319	37	0.19	37	7
1	364	45	0.23	45	5
1	402	38	0.27	38	6
1	431	29	0.30	29	9
1	447	16	0.32	16	16
1	458	11	0.33	11	24
3	487	29	0.36	10	27
3	525	38	0.39	13	21
3	544	19	0.41	6	43
3	566	22	0.44	7	37
3	567	1	0.44	0	965
3	571	4	0.44	1	223



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

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DYNAMIC CONE PENETROMETER TESTING

DCP210

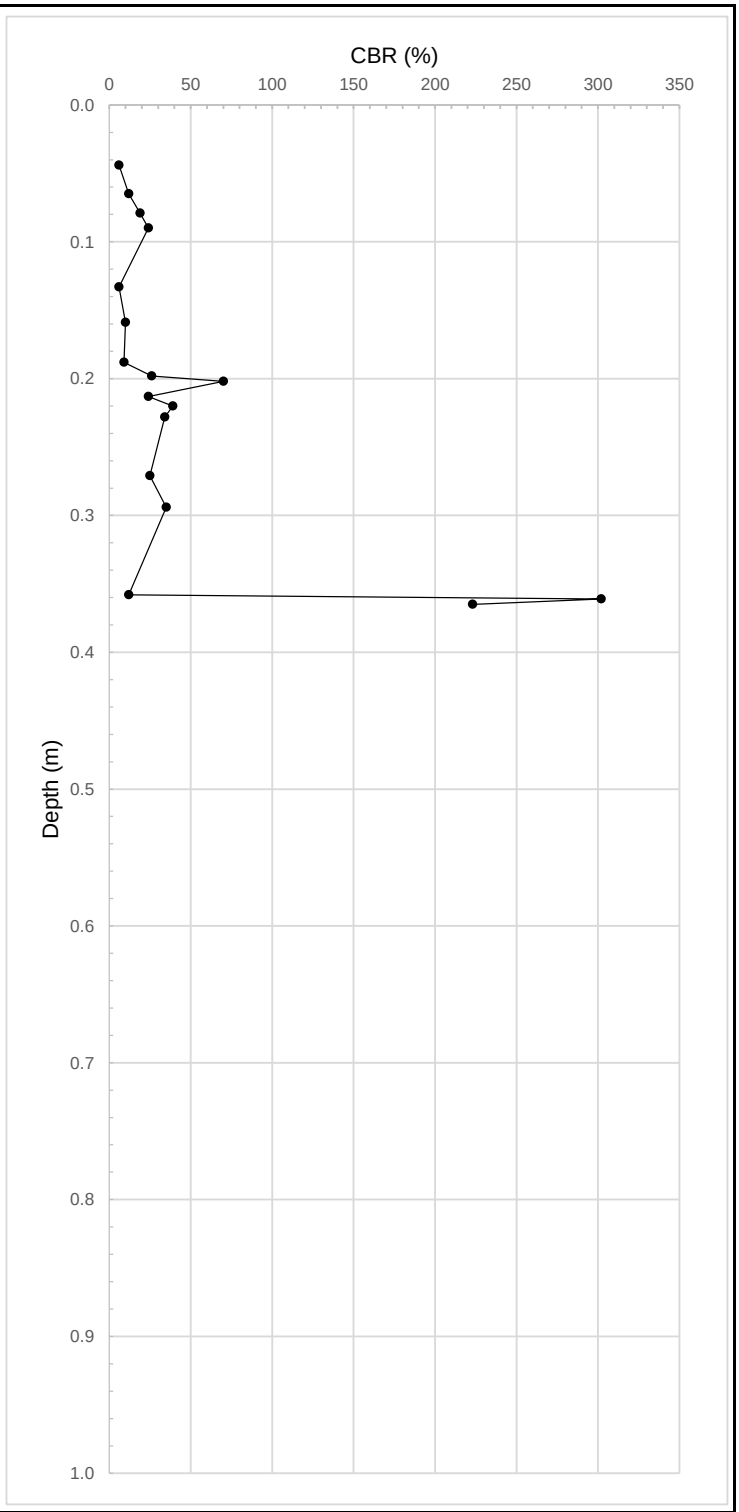
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 114 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	158	44	0.04	44	6
1	179	21	0.07	21	12
1	193	14	0.08	14	19
1	204	11	0.09	11	24
1	247	43	0.13	43	6
1	273	26	0.16	26	10
1	302	29	0.19	29	9
1	312	10	0.20	10	26
1	316	4	0.20	4	70
1	327	11	0.21	11	24
1	334	7	0.22	7	39
1	342	8	0.23	8	34
4	385	43	0.27	11	25
3	408	23	0.29	8	35
3	472	64	0.36	21	12
3	475	3	0.36	1	302
3	479	4	0.37	1	223



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP210 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

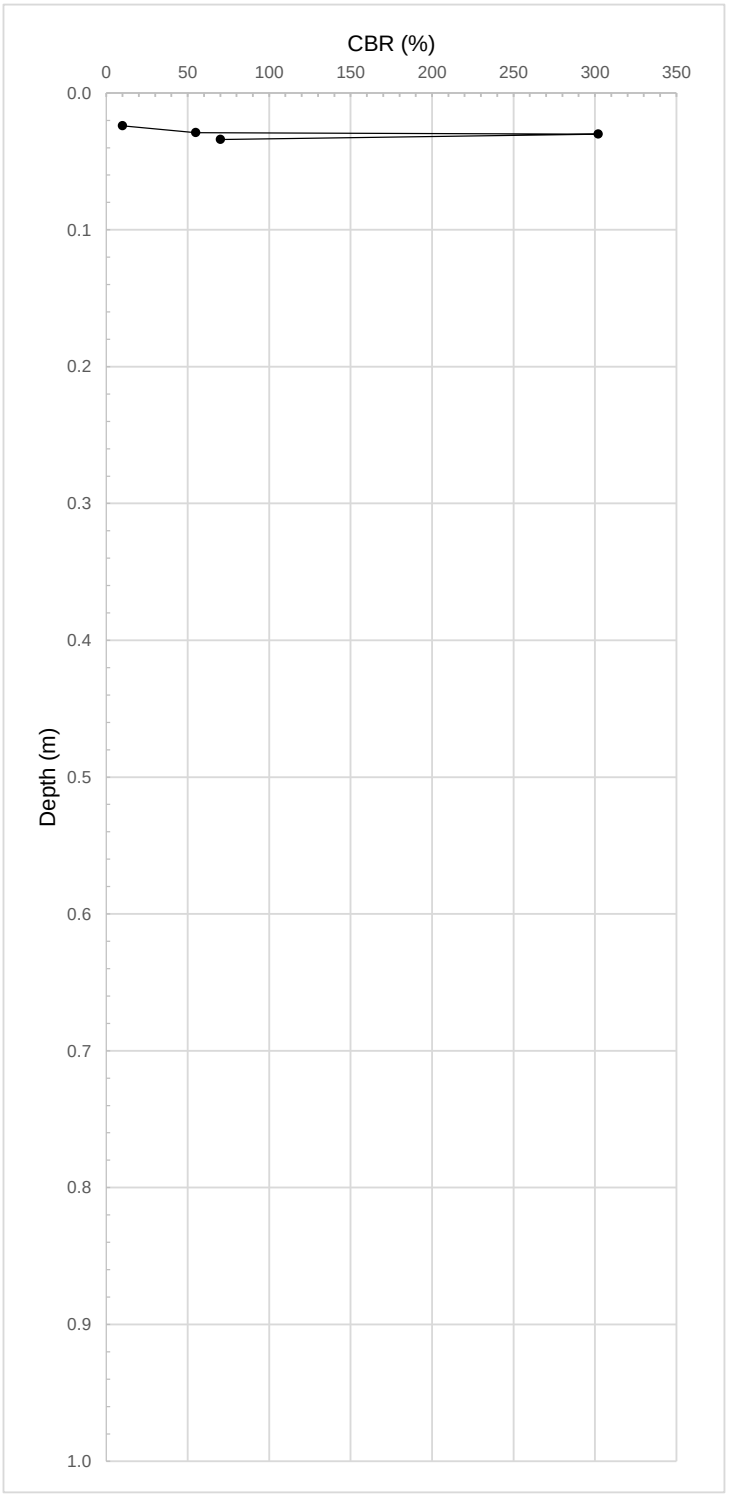
DCP210

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	163	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	187	24	0.02	24	10
1	192	5	0.03	5	55
1	193	1	0.03	1	302
1	197	4	0.03	4	70



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

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DYNAMIC CONE PENETROMETER TESTING

DCP211

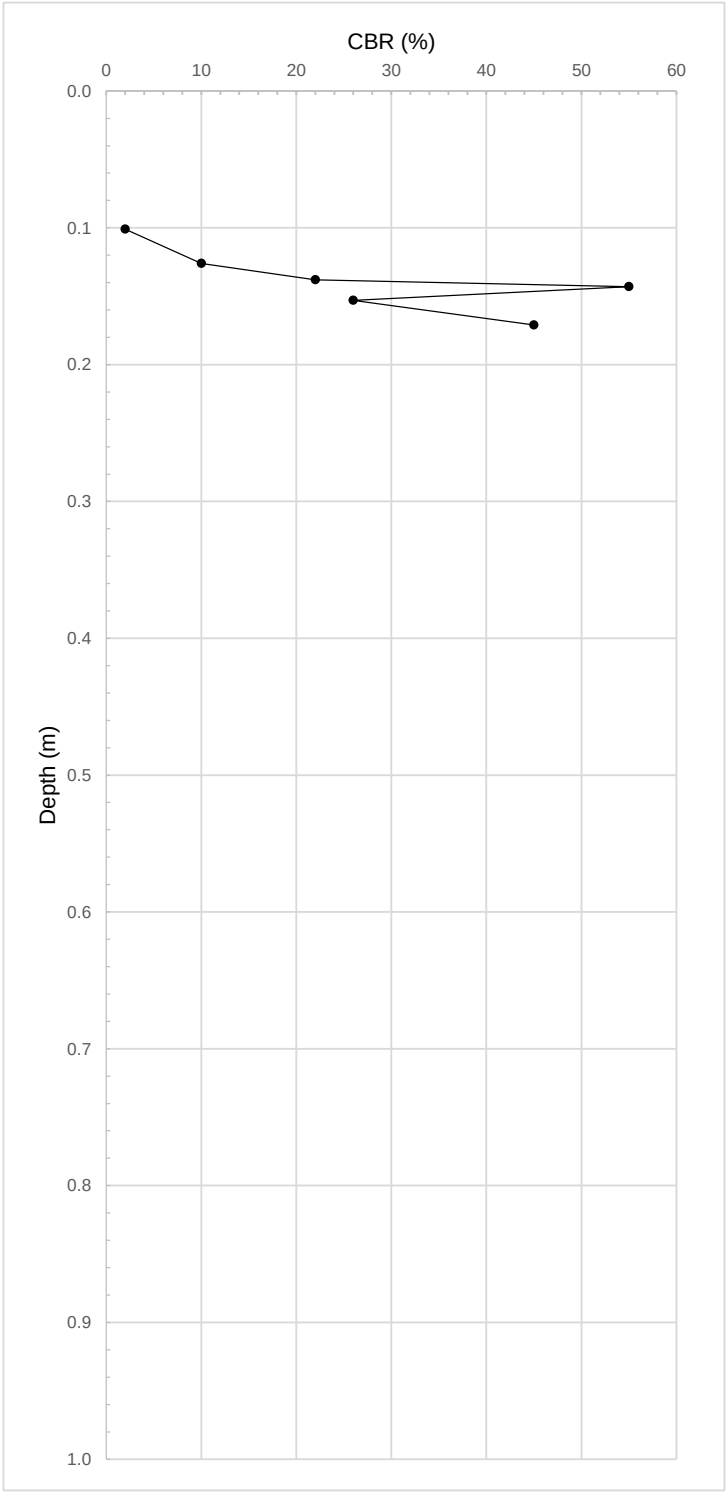
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 123 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	224	101	0.10	101	2
1	249	25	0.13	25	10
1	261	12	0.14	12	22
1	266	5	0.14	5	55
1	276	10	0.15	10	26
3	294	18	0.17	6	45



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP211 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

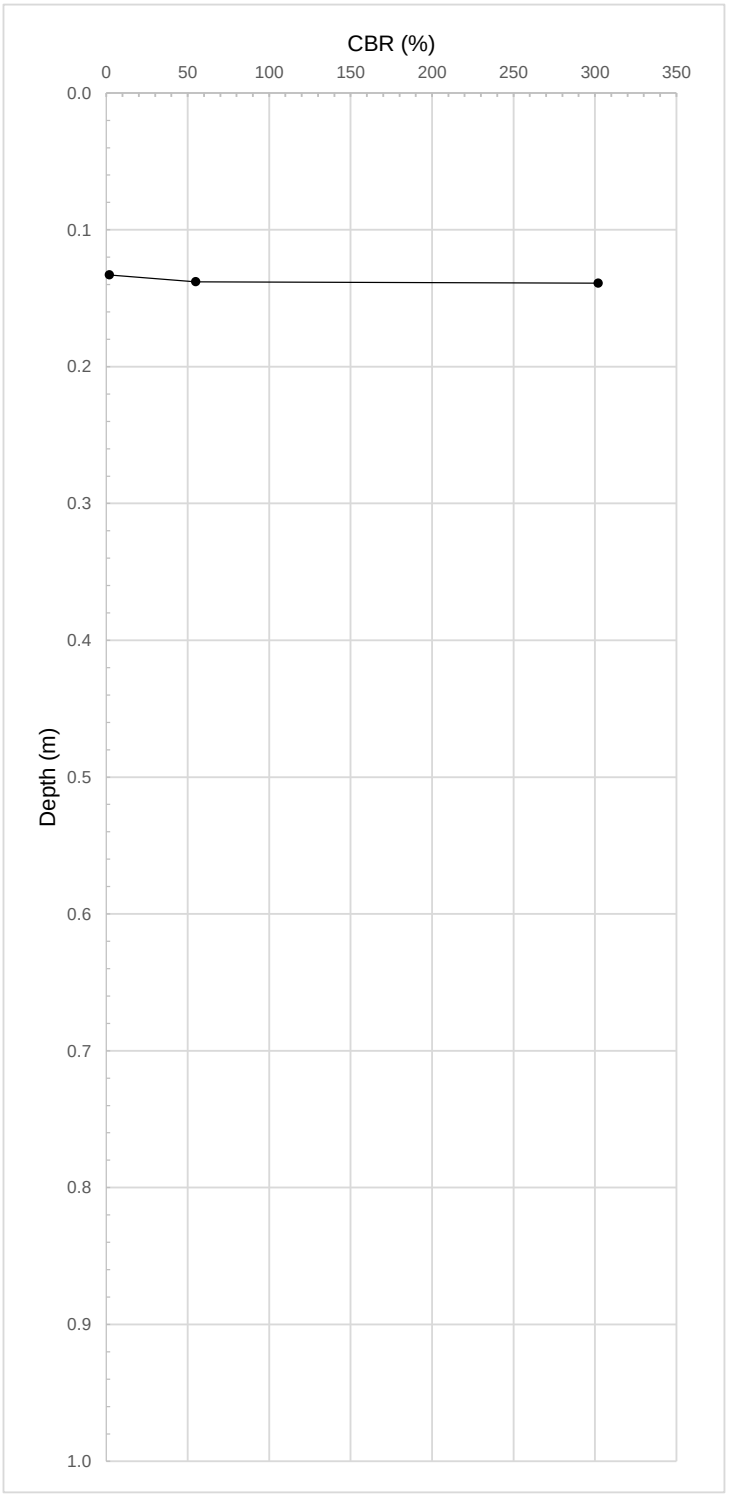
DCP211

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	114	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	247	133	0.13	133	2
1	252	5	0.14	5	55
1	253	1	0.14	1	302



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP212

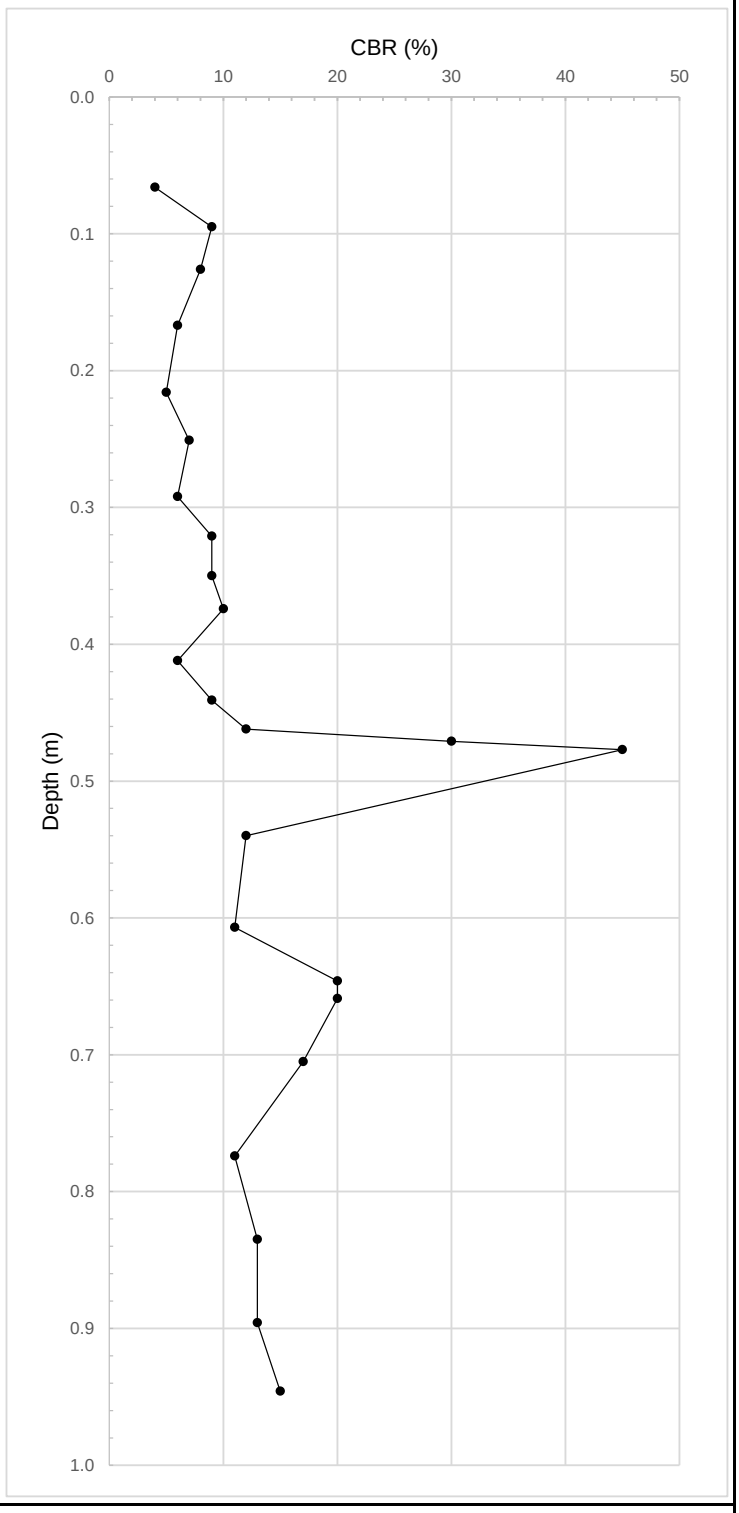
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 162 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	228	66	0.07	66	4
1	257	29	0.10	29	9
1	288	31	0.13	31	8
1	329	41	0.17	41	6
1	378	49	0.22	49	5
1	413	35	0.25	35	7
1	454	41	0.29	41	6
1	483	29	0.32	29	9
1	512	29	0.35	29	9
1	536	24	0.37	24	10
1	574	38	0.41	38	6
1	603	29	0.44	29	9
1	624	21	0.46	21	12
1	633	9	0.47	9	30
1	639	6	0.48	6	45
3	702	63	0.54	21	12
3	769	67	0.61	22	11
3	808	39	0.65	13	20
1	821	13	0.66	13	20
3	867	46	0.71	15	17
3	936	69	0.77	23	11
3	997	61	0.84	20	13
3	1058	61	0.90	20	13
3	1108	50	0.95	17	15



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

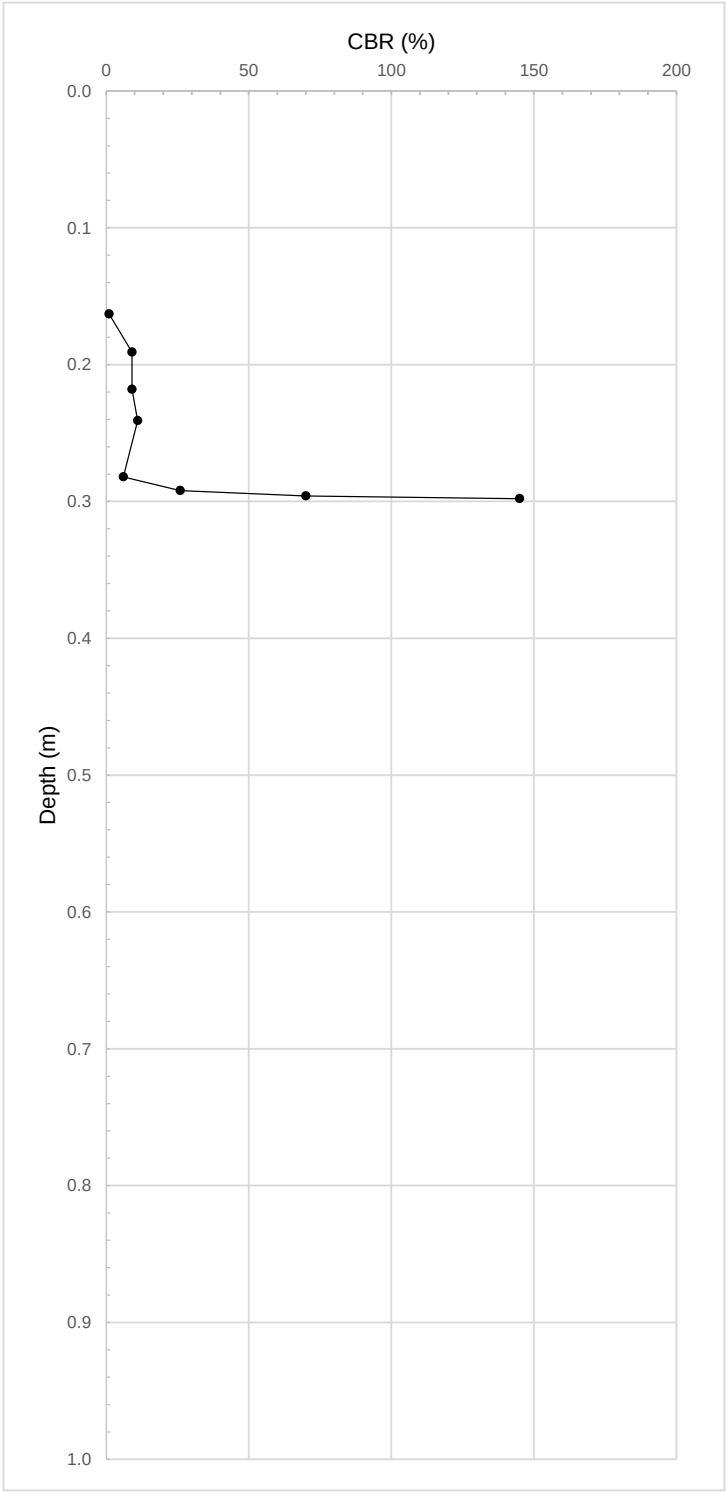
DCP213

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	1
Initial Scale Reading (mm)	131	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	294	163	0.16	163	1
1	322	28	0.19	28	9
1	349	27	0.22	27	9
1	372	23	0.24	23	11
1	413	41	0.28	41	6
1	423	10	0.29	10	26
1	427	4	0.30	4	70
1	429	2	0.30	2	145



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP213 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP213

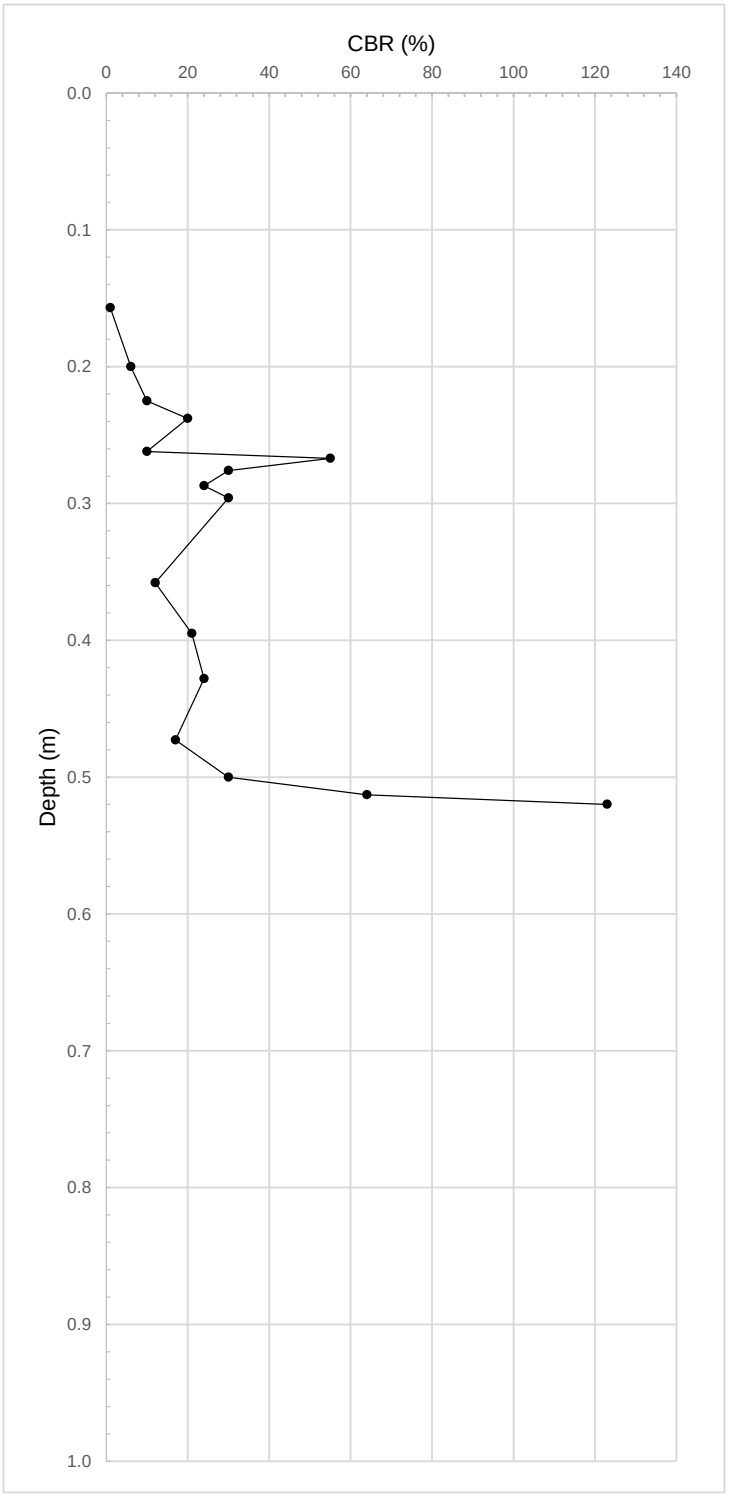
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 2

Initial Scale Reading (mm) 114 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	271	157	0.16	157	1
1	314	43	0.20	43	6
1	339	25	0.23	25	10
1	352	13	0.24	13	20
1	376	24	0.26	24	10
1	381	5	0.27	5	55
1	390	9	0.28	9	30
1	401	11	0.29	11	24
1	410	9	0.30	9	30
3	472	62	0.36	21	12
3	509	37	0.40	12	21
3	542	33	0.43	11	24
3	587	45	0.47	15	17
3	614	27	0.50	9	30
3	627	13	0.51	4	64
3	634	7	0.52	2	123



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP214

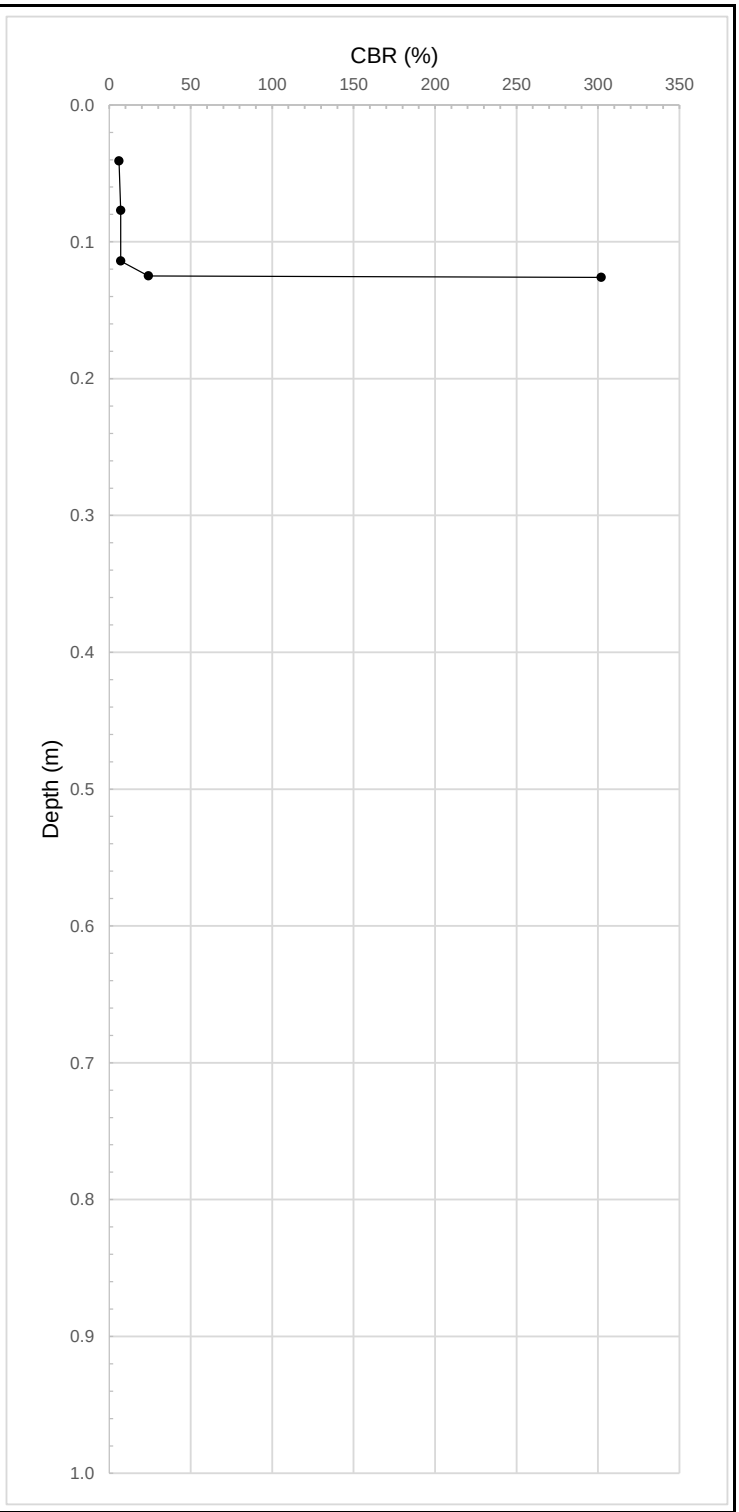
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 202 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	243	41	0.04	41	6
1	279	36	0.08	36	7
1	316	37	0.11	37	7
1	327	11	0.13	11	24
1	328	1	0.13	1	302



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP214 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP214

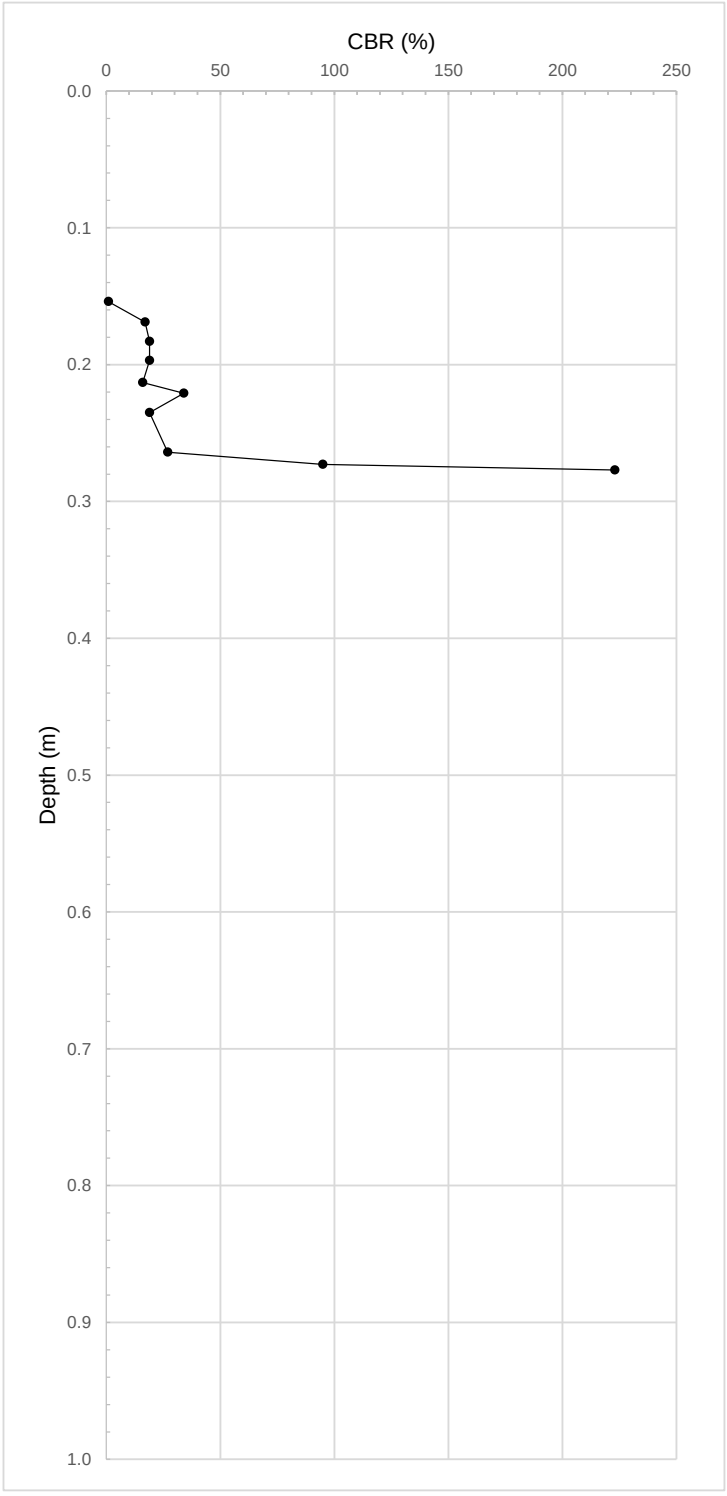
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 2

Initial Scale Reading (mm) 154 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	308	154	0.15	154	1
1	323	15	0.17	15	17
1	337	14	0.18	14	19
1	351	14	0.20	14	19
1	367	16	0.21	16	16
1	375	8	0.22	8	34
1	389	14	0.24	14	19
3	418	29	0.26	10	27
3	427	9	0.27	3	95
3	431	4	0.28	1	223



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

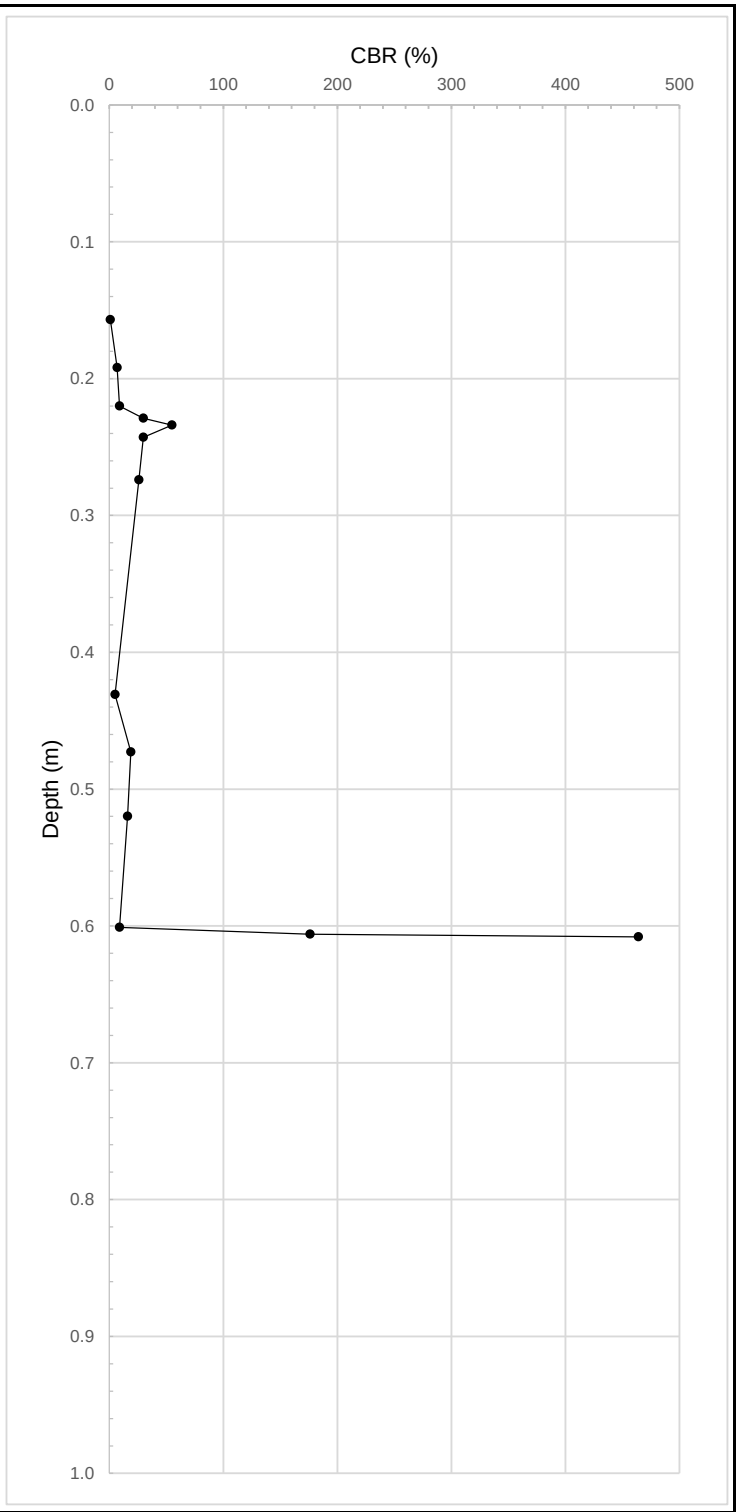
DCP216

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	1
Initial Scale Reading (mm)	115	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	272	157	0.16	157	1
1	307	35	0.19	35	7
1	335	28	0.22	28	9
1	344	9	0.23	9	30
1	349	5	0.23	5	55
1	358	9	0.24	9	30
3	389	31	0.27	10	26
3	546	157	0.43	52	5
3	588	42	0.47	14	19
3	635	47	0.52	16	16
3	716	81	0.60	27	9
3	721	5	0.61	2	176
3	723	2	0.61	1	464



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP216 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

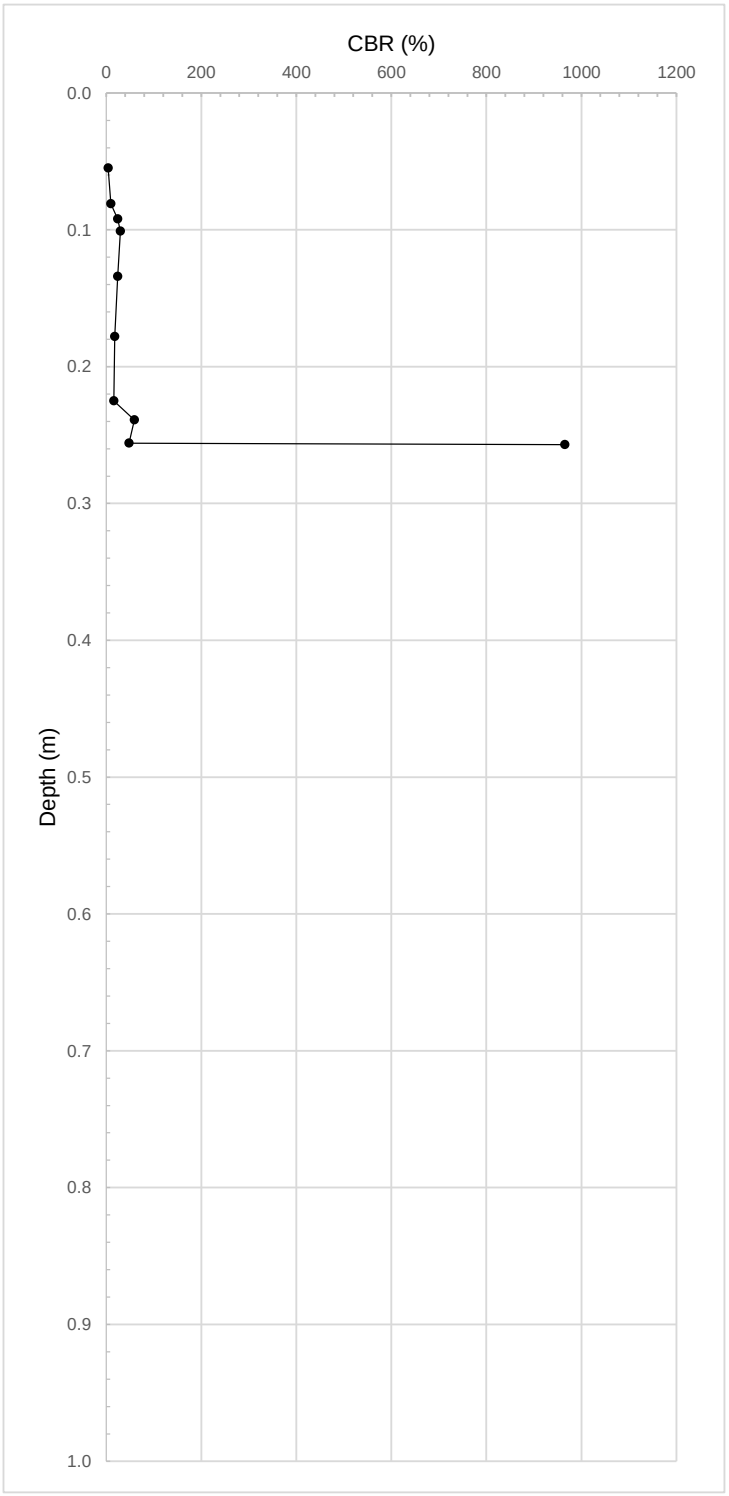
DCP216

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	178	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	233	55	0.06	55	4
1	259	26	0.08	26	10
1	270	11	0.09	11	24
1	279	9	0.10	9	30
3	312	33	0.13	11	24
3	356	44	0.18	15	18
3	403	47	0.23	16	16
3	417	14	0.24	5	59
3	434	17	0.26	6	48
3	435	1	0.26	0	965



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP217

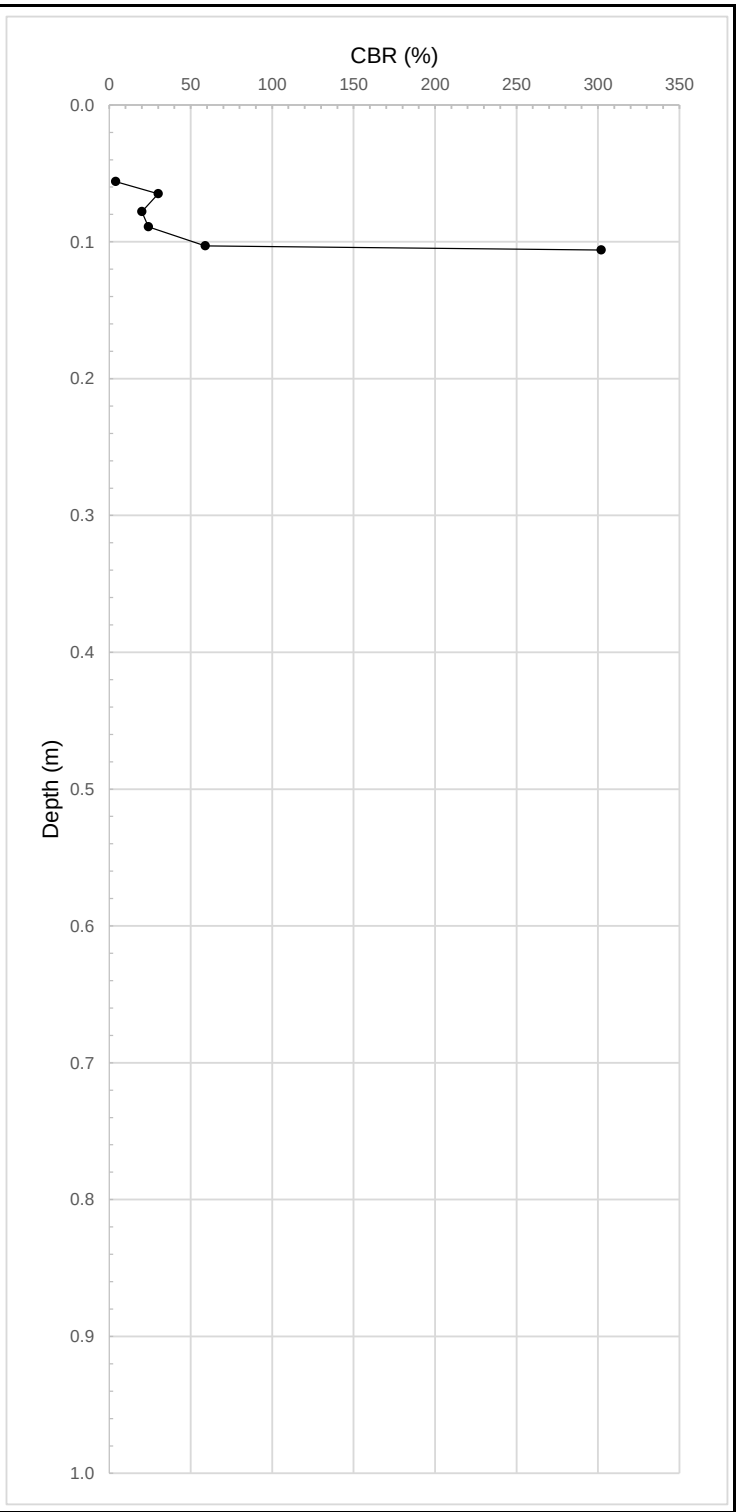
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 116 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	172	56	0.06	56	4
1	181	9	0.07	9	30
1	194	13	0.08	13	20
1	205	11	0.09	11	24
3	219	14	0.10	5	59
3	222	3	0.11	1	302



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP217 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

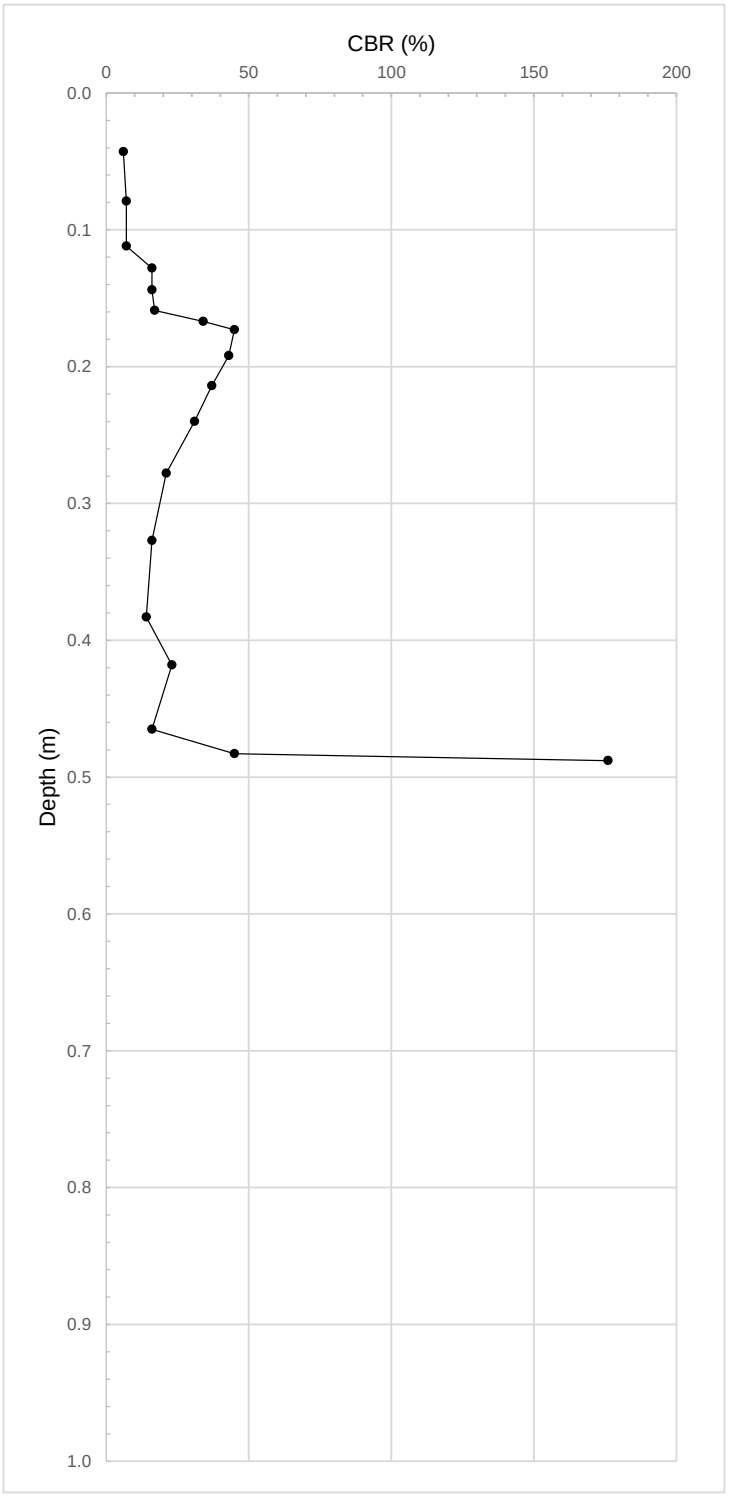
DCP217

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	104	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	147	43	0.04	43	6
1	183	36	0.08	36	7
1	216	33	0.11	33	7
1	232	16	0.13	16	16
1	248	16	0.14	16	16
1	263	15	0.16	15	17
1	271	8	0.17	8	34
1	277	6	0.17	6	45
3	296	19	0.19	6	43
3	318	22	0.21	7	37
3	344	26	0.24	9	31
3	382	38	0.28	13	21
3	431	49	0.33	16	16
3	487	56	0.38	19	14
3	522	35	0.42	12	23
3	569	47	0.47	16	16
3	587	18	0.48	6	45
3	592	5	0.49	2	176



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP218

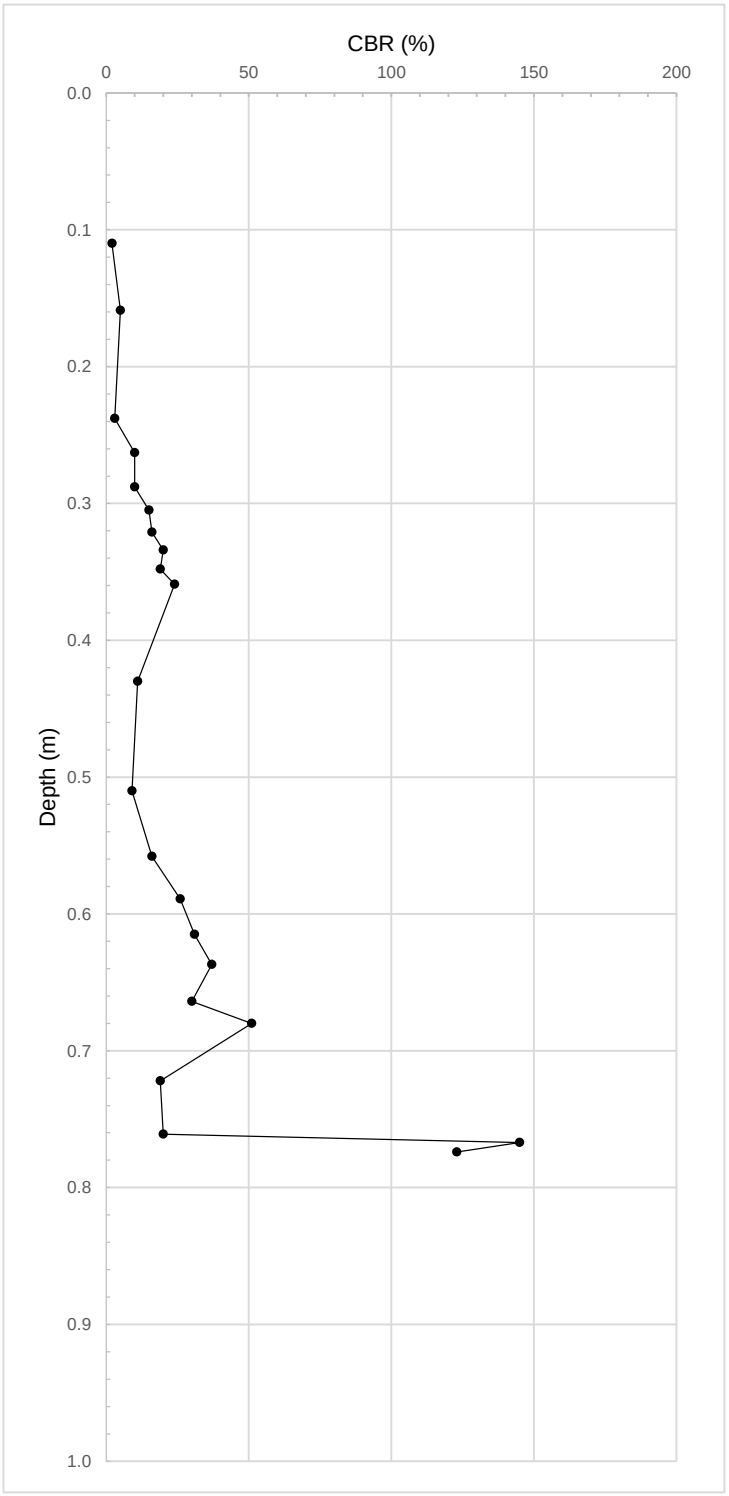
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 124 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	234	110	0.11	110	2
1	283	49	0.16	49	5
1	362	79	0.24	79	3
1	387	25	0.26	25	10
1	412	25	0.29	25	10
1	429	17	0.31	17	15
1	445	16	0.32	16	16
1	458	13	0.33	13	20
1	472	14	0.35	14	19
1	483	11	0.36	11	24
3	554	71	0.43	24	11
3	634	80	0.51	27	9
3	682	48	0.56	16	16
3	713	31	0.59	10	26
3	739	26	0.62	9	31
3	761	22	0.64	7	37
3	788	27	0.66	9	30
3	804	16	0.68	5	51
3	846	42	0.72	14	19
3	885	39	0.76	13	20
3	891	6	0.77	2	145
3	898	7	0.77	2	123



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP218 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

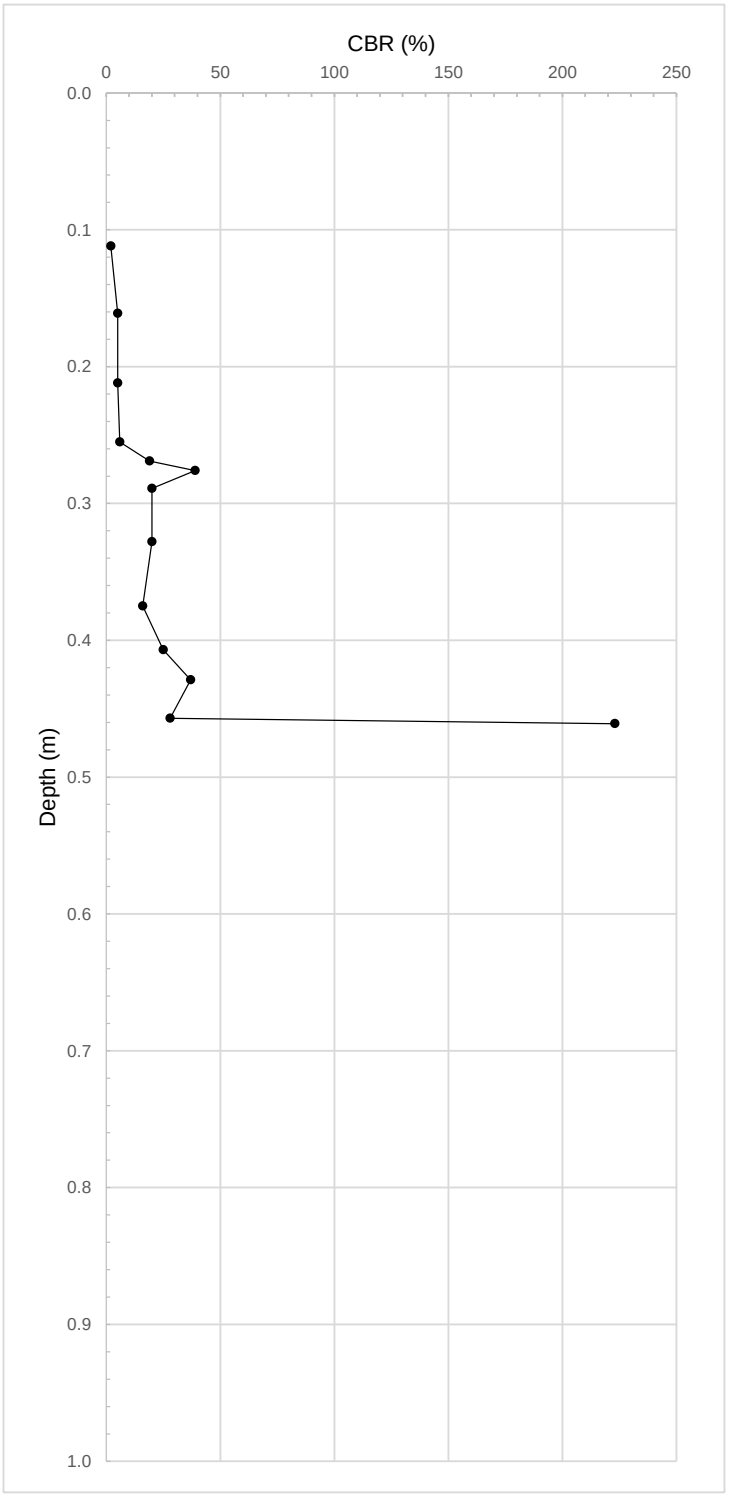
DCP218

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	147	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	259	112	0.11	112	2
1	308	49	0.16	49	5
1	359	51	0.21	51	5
1	402	43	0.26	43	6
1	416	14	0.27	14	19
1	423	7	0.28	7	39
1	436	13	0.29	13	20
3	475	39	0.33	13	20
3	522	47	0.38	16	16
3	554	32	0.41	11	25
3	576	22	0.43	7	37
3	604	28	0.46	9	28
3	608	4	0.46	1	223



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP219

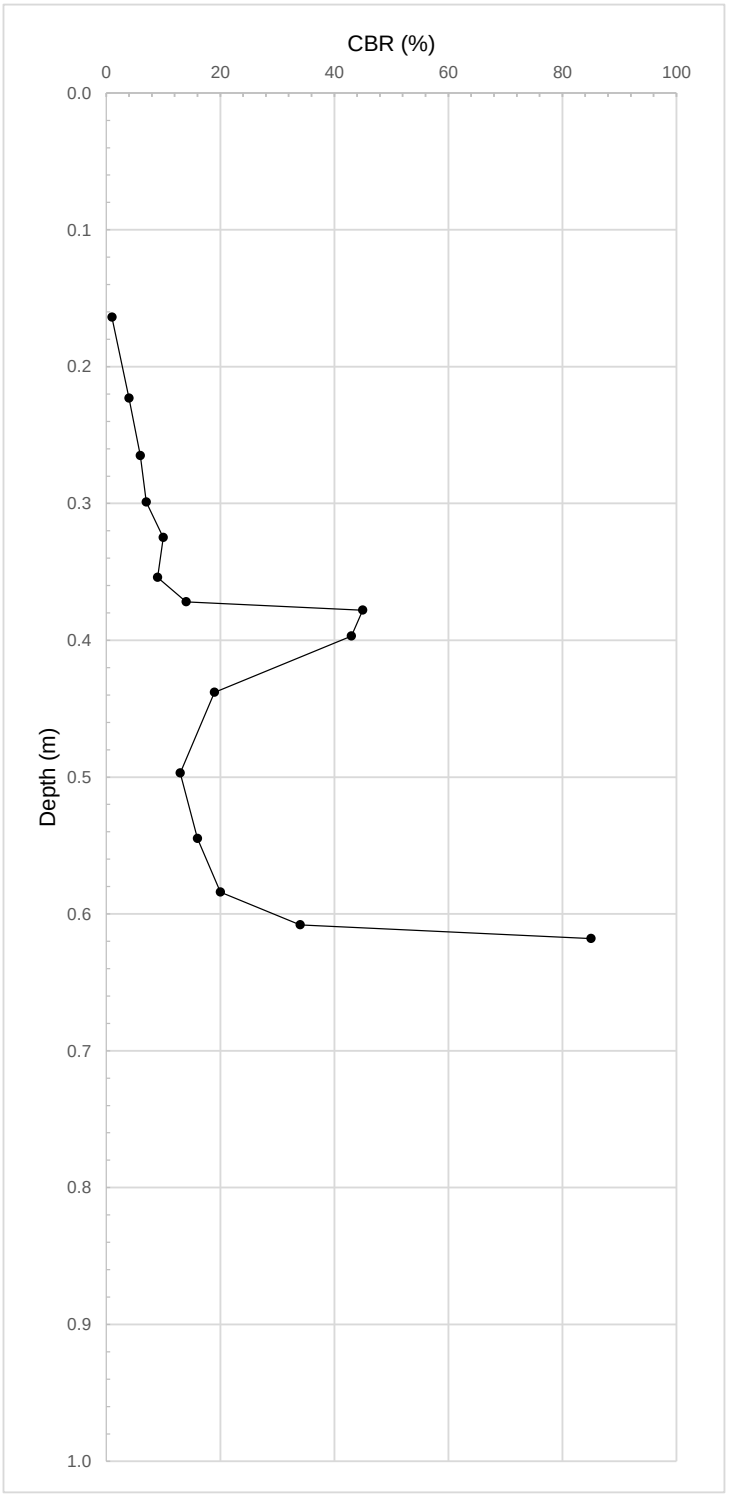
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 1

Initial Scale Reading (mm) 104 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	268	164	0.16	164	1
1	327	59	0.22	59	4
1	369	42	0.27	42	6
1	403	34	0.30	34	7
1	429	26	0.33	26	10
1	458	29	0.35	29	9
1	476	18	0.37	18	14
1	482	6	0.38	6	45
3	501	19	0.40	6	43
3	542	41	0.44	14	19
3	601	59	0.50	20	13
3	649	48	0.55	16	16
3	688	39	0.58	13	20
3	712	24	0.61	8	34
3	722	10	0.62	3	85



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP219 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

DCP219

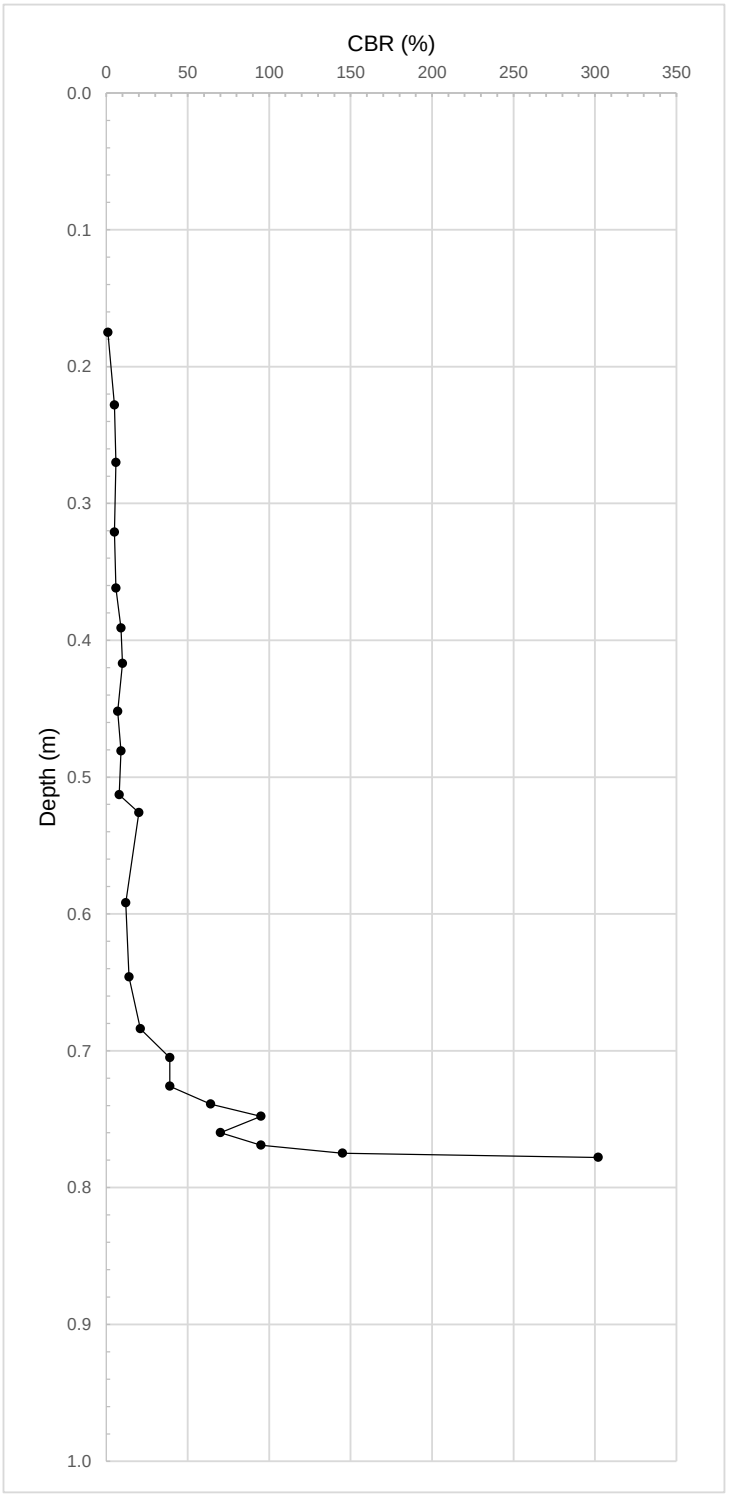
CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date 09/05/2024 Test No. 2

Initial Scale Reading (mm) 106 Datum bgl (mm) 0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	281	175	0.18	175	1
1	334	53	0.23	53	5
1	376	42	0.27	42	6
1	427	51	0.32	51	5
1	468	41	0.36	41	6
1	497	29	0.39	29	9
1	523	26	0.42	26	10
1	558	35	0.45	35	7
1	587	29	0.48	29	9
1	619	32	0.51	32	8
1	632	13	0.53	13	20
3	698	66	0.59	22	12
3	752	54	0.65	18	14
3	790	38	0.68	13	21
3	811	21	0.71	7	39
3	832	21	0.73	7	39
3	845	13	0.74	4	64
3	854	9	0.75	3	95
3	866	12	0.76	4	70
3	875	9	0.77	3	95
3	881	6	0.78	2	145
3	884	3	0.78	1	302



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

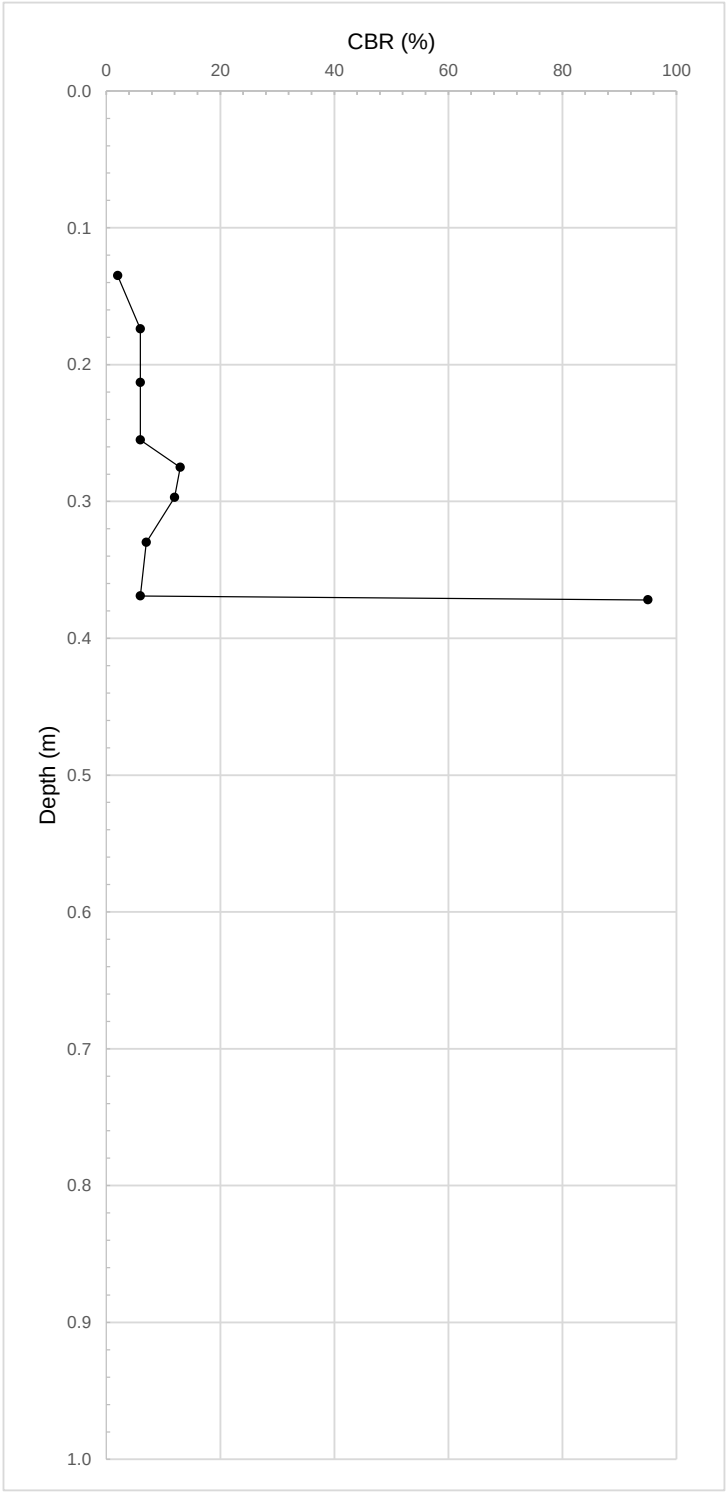
DCP220

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	1
Initial Scale Reading (mm)	139	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	274	135	0.14	135	2
1	313	39	0.17	39	6
1	352	39	0.21	39	6
1	394	42	0.26	42	6
1	414	20	0.28	20	13
1	436	22	0.30	22	12
1	469	33	0.33	33	7
1	508	39	0.37	39	6
1	511	3	0.37	3	95



Remarks:

CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

DCP terminated due to refusal, reattempted as DCP220 Test 2.

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

DYNAMIC CONE PENETROMETER TESTING

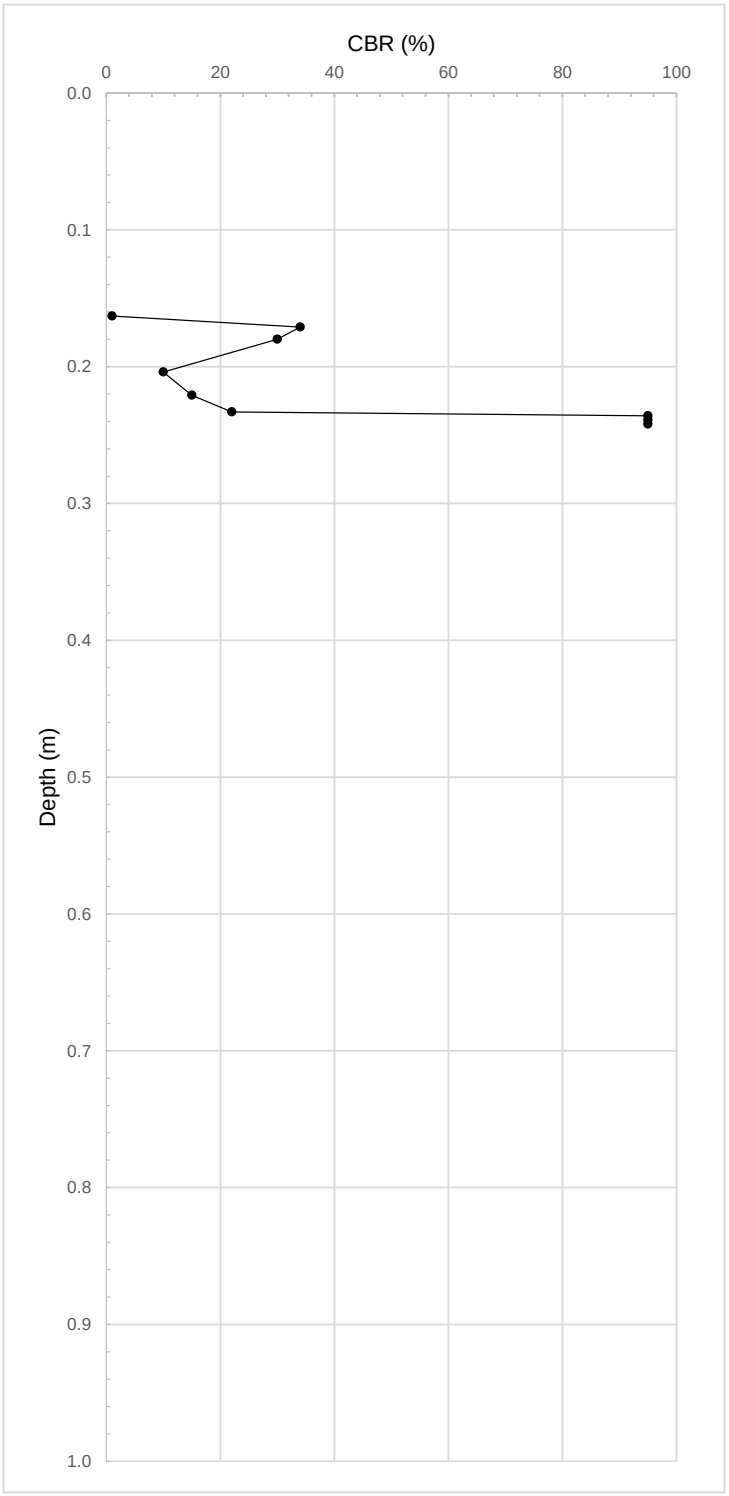
DCP220

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

Test date	09/05/2024	Test No.	2
Initial Scale Reading (mm)	98	Datum bgl (mm)	0

no. of blows	Scale reading (mm)	Penetration Increment (mm)	Depth bgl (m)	DCP (mm/blow)	CBR (%)
1	261	163	0.16	163	1
1	269	8	0.17	8	34
1	278	9	0.18	9	30
1	302	24	0.20	24	10
1	319	17	0.22	17	15
1	331	12	0.23	12	22
1	334	3	0.24	3	95
1	337	3	0.24	3	95
1	340	3	0.24	3	95



Remarks:
CBR correlation based on the relationship Log10 (CBR) = 2.48 - 1.057 * Log10 (mm/blow) developed by TRL taken from Highways England CS229: Data for Pavement Assessment (2020).

CONTRACT	CHECKED
38113	**JH**

APPENDIX B

MONITORING DATA

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH301**

INSTALLED PIPE DEPTH (m) 2.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 11:50	974 / 0.00	16								0.0		
17/05/2024 11:51	974 / 0.00									0.0		
17/05/2024 11:52	974 / 0.00									0.0		
17/05/2024 11:53	974 / 0.00									0.0		
17/05/2024 11:54	974 / 0.00									0.0		
17/05/2024 12:00			0.0	0.0	16.9	0.0	0.0	0.0				
17/05/2024 12:01			0.0	0.0	16.8	0.0	0.0	0.0				
17/05/2024 12:02			0.0	0.0	16.8	0.0	0.0	0.0				
17/05/2024 12:03			0.0	0.0	16.8	0.0	0.0	0.0				
17/05/2024 12:04			0.0	0.0	16.8	0.0	0.0	0.0				
17/05/2024 12:05												Dry
23/05/2024 11:48	976 / 0.00	12								0.0		
23/05/2024 11:49	976 / 0.00									0.0		
23/05/2024 11:50	976 / 0.00									0.0		
23/05/2024 11:51	976 / 0.00									0.0		
23/05/2024 11:52	976 / 0.00									0.0		
23/05/2024 11:53			0.1	0.0	17.8	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH301**

INSTALLED PIPE DEPTH (m) 2.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 11:54			0.1	0.0	17.8	0.0	0.0	0.0				
23/05/2024 11:55			0.1	0.0	17.8	0.0	0.0	0.0				
23/05/2024 11:56			0.1	0.0	17.9	0.0	0.0	0.0				
23/05/2024 11:57			0.0	0.0	17.9	0.0	0.0	0.0				
23/05/2024 11:58			0.0	0.0	17.9	0.0	0.0	0.0				
23/05/2024 11:59												Dry
31/05/2024 10:45	982 / 0.00	17								0.0		
31/05/2024 10:46	982 / 0.00									0.0		
31/05/2024 10:47	981 / 0.00									0.0		
31/05/2024 10:48	981 / 0.00									0.0		
31/05/2024 10:49	981 / 0.00									0.0		
31/05/2024 10:50	981 / 0.00									0.0		
31/05/2024 10:51			0.7	0.0	19.3	0.0	0.0	0.0				
31/05/2024 10:52			0.1	0.0	19.6	0.0	0.0	0.0				
31/05/2024 10:53			0.1	0.0	19.5	0.0	0.0	0.0				
31/05/2024 10:54			0.1	0.0	19.5	0.0	0.0	0.0				
31/05/2024 10:55			0.1	0.0	19.4	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH301**

INSTALLED PIPE DEPTH (m) 2.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 10:56			0.1	0.0	19.3	0.0	0.0	0.0				
31/05/2024 10:57			0.1	0.0	19.3	0.0	0.0	0.0				
31/05/2024 10:58			0.1	0.0	19.3	0.0	0.0	0.0				
31/05/2024 10:59												Dry
14/06/2024 11:00	961 / 0.01	14								0.0		
14/06/2024 11:01	961 / 0.01									0.0		
14/06/2024 11:02	961 / 0.01									0.0		
14/06/2024 11:03	961 / 0.01									0.0		
14/06/2024 11:04	961 / 0.01									0.0		
14/06/2024 11:05	961 / 0.01									0.0		
14/06/2024 11:06			0.0	0.0	19.6	0.0	0.0	0.0				
14/06/2024 11:07			0.0	0.0	19.4	0.0	0.0	0.0				
14/06/2024 11:08			0.0	0.0	19.3	0.0	0.0	0.0				
14/06/2024 11:09			0.0	0.0	19.3	0.0	0.0	0.0				
14/06/2024 11:10			0.0	0.0	19.3	0.0	0.0	0.0				
14/06/2024 11:11			0.0	0.0	19.3	0.0	0.0	0.0				
14/06/2024 11:12												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH301**

INSTALLED PIPE DEPTH (m) 2.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 10:03	974 / 0.00	14								0.0		
21/06/2024 10:04	974 / 0.00									0.0		
21/06/2024 10:05	974 / 0.00									0.0		
21/06/2024 10:06	974 / 0.00									0.0		
21/06/2024 10:07	974 / 0.00									0.0		
21/06/2024 10:08	974 / 0.00									0.0		
21/06/2024 10:09			0.5	0.0	20.4	0.0	0.0	0.0				
21/06/2024 10:10			0.0	0.0	18.8	0.0	0.0	0.0				
21/06/2024 10:11			0.0	0.0	18.7	0.0	0.0	0.0				
21/06/2024 10:12			0.0	0.0	18.7	0.0	0.0	0.0				
21/06/2024 10:13			0.0	0.0	18.7	0.0	0.0	0.0				
21/06/2024 10:14			0.0	0.0	18.7	0.0	0.0	0.0				
21/06/2024 10:15												Dry
28/06/2024 10:44	978 / 0.00	14								0.0		
28/06/2024 10:45	979 / 0.00									0.0		
28/06/2024 10:46	979 / 0.00									0.0		
28/06/2024 10:47	979 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH301**

INSTALLED PIPE DEPTH (m) 2.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
28/06/2024 10:48	979 / 0.00									0.0		
28/06/2024 10:49	979 / 0.00									0.0		
28/06/2024 10:50			0.1	0.0	20.5	0.0	0.0	0.0				
28/06/2024 10:51			0.0	0.0	20.4	0.0	0.0	0.0				
28/06/2024 10:52			0.0	0.0	20.4	0.0	0.0	0.0				
28/06/2024 10:53			0.0	0.0	20.4	0.0	0.0	0.0				
28/06/2024 10:54			0.0	0.0	20.5	0.0	0.0	0.0				
28/06/2024 10:55			0.0	0.0	20.5	0.0	0.0	0.0				
28/06/2024 10:56			0.0	0.0	20.5	0.0	0.0	0.0				
28/06/2024 10:57												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH302B**

INSTALLED PIPE DEPTH (m) 9.30

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 12:15	970 / 0.00	16								0.0		
17/05/2024 12:16	970 / 0.00									0.0		
17/05/2024 12:17	970 / 0.00									0.0		
17/05/2024 12:18	970 / 0.00									0.0		
17/05/2024 12:19	970 / 0.00									0.0		
17/05/2024 12:20			1.7	0.0	18.0	0.0	0.0	0.0				
17/05/2024 12:21			2.1	0.0	16.8	0.0	0.0	0.0				
17/05/2024 12:22			2.2	0.0	16.2	0.0	0.0	0.0				
17/05/2024 12:23			2.2	0.0	16.6	0.0	0.0	0.0				
17/05/2024 12:24			2.2	0.0	16.6	0.0	0.0	0.0				
17/05/2024 12:25			2.2	0.0	16.6	0.0	0.0	0.0				
17/05/2024 12:26												Dry
23/05/2024 12:04	974 / 0.00	13								0.0		
23/05/2024 12:05	974 / 0.00									0.0		
23/05/2024 12:06	974 / 0.00									0.0		
23/05/2024 12:07	974 / 0.00									0.0		
23/05/2024 12:08	974 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH302B**

INSTALLED PIPE DEPTH (m) 9.30

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 12:09			2.3	0.0	16.9	0.0	0.0	0.0				
23/05/2024 12:10			2.3	0.0	16.9	0.0	0.0	0.0				
23/05/2024 12:11			2.3	0.0	16.8	0.0	0.0	0.0				
23/05/2024 12:12			2.3	0.0	16.8	0.0	0.0	0.0				
23/05/2024 12:13			2.3	0.0	16.8	0.0	0.0	0.0				
23/05/2024 12:14												Dry
31/05/2024 11:11	981 / 0.00	18								0.0		
31/05/2024 11:12	982 / 0.00									0.0		
31/05/2024 11:13	982 / 0.00									0.0		
31/05/2024 11:14	982 / 0.00									0.0		
31/05/2024 11:15	982 / 0.00									0.0		
31/05/2024 11:16	982 / 0.00									0.0		
31/05/2024 11:17			2.1	0.0	18.2	0.0	0.0	0.0				
31/05/2024 11:18			2.4	0.0	17.3	0.0	0.0	0.0				
31/05/2024 11:19			2.4	0.0	17.3	0.0	0.0	0.0				
31/05/2024 11:20			2.4	0.0	17.3	0.0	0.0	0.0				
31/05/2024 11:21			2.4	0.0	17.3	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH302B**

INSTALLED PIPE DEPTH (m) 9.30

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 11:22			2.4	0.0	17.3	0.0	0.0	0.0				
31/05/2024 11:23												Dry
14/06/2024 11:30	958 / -0.02	14								-1.0		
14/06/2024 11:31	958 / 0.00									0.0		
14/06/2024 11:32	958 / -0.02									-0.1		
14/06/2024 11:33	958 / -0.02									-0.1		
14/06/2024 11:34	958 / -0.02									-0.1		
14/06/2024 11:35	958 / -0.02									-0.1		
14/06/2024 11:36			0.9	0.0	19.3	0.0	0.0	0.0				
14/06/2024 11:37			2.8	0.0	16.6	0.0	0.0	0.0				
14/06/2024 11:38			2.9	0.0	16.4	0.0	0.0	0.0				
14/06/2024 11:39			2.9	0.0	16.4	0.0	0.0	0.0				
14/06/2024 11:40			2.9	0.0	15.4	0.0	0.0	0.0				
14/06/2024 11:41			2.9	0.0	15.4	0.0	0.0	0.0				
14/06/2024 11:42												Dry
21/06/2024 10:25	974 / 0.00	14								0.0		
21/06/2024 10:26	974 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH302B**

INSTALLED PIPE DEPTH (m) 9.30

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 10:27	974 / 0.00									0.0		
21/06/2024 10:28	974 / 0.00									0.0		
21/06/2024 10:29	974 / 0.00									0.0		
21/06/2024 10:30	974 / 0.00									0.0		
21/06/2024 10:31			0.5	0.0	19.4	0.0	0.0	0.0				
21/06/2024 10:32			2.7	0.0	17.9	0.0	0.0	0.0				
21/06/2024 10:33			2.7	0.0	17.8	0.0	0.0	0.0				
21/06/2024 10:34			2.8	0.0	17.8	0.0	0.0	0.0				
21/06/2024 10:35			2.8	0.0	17.8	0.0	0.0	0.0				
21/06/2024 10:36			2.8	0.0	17.8	0.0	0.0	0.0				
21/06/2024 10:37												Dry
28/06/2024 11:10	976 / 0.00	14								0.0		
28/06/2024 11:11	975 / 0.00									0.0		
28/06/2024 11:12	975 / 0.00									0.0		
28/06/2024 11:13	975 / 0.00									0.0		
28/06/2024 11:14	975 / 0.00									0.0		
28/06/2024 11:15	975 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH302B**

INSTALLED PIPE DEPTH (m) 9.30

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
28/06/2024 11:16			0.5	0.0	20.8	0.0	0.0	0.0				
28/06/2024 11:17			2.4	0.0	18.3	0.0	0.0	0.0				
28/06/2024 11:18			2.4	0.0	18.1	0.0	0.0	0.0				
28/06/2024 11:19			2.4	0.0	18.1	0.0	0.0	0.0				
28/06/2024 11:20			2.4	0.0	18.1	0.0	0.0	0.0				
28/06/2024 11:21			2.5	0.0	18.0	0.0	0.0	0.0				
28/06/2024 11:22			2.5	0.0	18.0	0.0	0.0	0.0				
28/06/2024 11:23			2.5	0.0	18.0	0.0	0.0	0.0				
28/06/2024 11:24												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH303B**

INSTALLED PIPE DEPTH (m) 2.40

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 12:54	970 / 0.00	17								0.0		
17/05/2024 12:55	970 / 0.00									0.0		
17/05/2024 12:56	970 / 0.00									0.0		
17/05/2024 12:57	970 / 0.00									0.0		
17/05/2024 12:58	970 / 0.00									0.0		
17/05/2024 12:59			0.1	0.0	20.2	0.0	0.0	0.0				
17/05/2024 13:00			0.1	0.0	20.2	0.0	0.0	0.0				
17/05/2024 13:01			0.1	0.0	20.2	0.0	0.0	0.0				
17/05/2024 13:02			0.1	0.0	20.2	0.0	0.0	0.0				
17/05/2024 13:03			0.1	0.0	20.3	0.0	0.0	0.0				
17/05/2024 13:04												Dry
23/05/2024 12:25	975 / 0.00	13								0.0		
23/05/2024 12:26	975 / 0.00									0.0		
23/05/2024 12:27	975 / 0.00									0.0		
23/05/2024 12:28	975 / 0.00									0.0		
23/05/2024 12:29	975 / 0.00									0.0		
23/05/2024 12:30			0.1	0.0	19.7	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH303B**

INSTALLED PIPE DEPTH (m) 2.40

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 12:31			0.1	0.0	19.7	0.0	0.0	0.0				
23/05/2024 12:32			0.1	0.0	19.7	0.0	0.0	0.0				
23/05/2024 12:33			0.1	0.0	19.7	0.0	0.0	0.0				
23/05/2024 12:34			0.1	0.0	19.7	0.0	0.0	0.0				
23/05/2024 12:35												Dry
31/05/2024 11:34	981 / 0.00	17								0.0		
31/05/2024 11:35	981 / 0.00									0.0		
31/05/2024 11:36	981 / 0.00									0.0		
31/05/2024 11:37	980 / 0.00									0.0		
31/05/2024 11:38	980 / 0.00									0.0		
31/05/2024 11:39	980 / 0.00									0.0		
31/05/2024 11:40			0.7	0.0	20.3	0.0	0.0	0.0				
31/05/2024 11:41			0.1	0.0	20.7	0.0	0.0	0.0				
31/05/2024 11:42			0.1	0.0	20.7	0.0	0.0	0.0				
31/05/2024 11:43			0.1	0.0	20.7	0.0	0.0	0.0				
31/05/2024 11:44			0.1	0.0	20.7	0.0	0.0	0.0				
31/05/2024 11:45			1.0	0.0	20.7	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH303B**

INSTALLED PIPE DEPTH (m) 2.40

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 11:46												Dry
14/06/2024 12:05	961 / -0.02	15								-0.1		
14/06/2024 12:06	961 / 0.00									0.0		
14/06/2024 12:07	961 / 0.01									0.0		
14/06/2024 12:08	961 / 0.05									0.1		
14/06/2024 12:09	961 / 0.06									0.1		
14/06/2024 12:10	961 / 0.10									0.2		
14/06/2024 12:11	961 / 0.11									0.3		
14/06/2024 12:12	961 / 0.13									0.3		
14/06/2024 12:13	961 / 0.15									0.4		
14/06/2024 12:14	961 / 0.20									0.5		
14/06/2024 12:15	961 / 0.20									0.5		
14/06/2024 12:16			0.8	0.0	18.2	0.0	0.0	0.0				
14/06/2024 12:17			0.2	0.0	19.5	0.0	0.0	0.0				
14/06/2024 12:18			0.2	0.0	19.5	0.0	0.0	0.0				
14/06/2024 12:19			0.2	0.0	19.5	0.0	0.0	0.0				
14/06/2024 12:20			0.1	0.0	19.5	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH303B**

INSTALLED PIPE DEPTH (m) 2.40

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/06/2024 12:21			0.1	0.0	19.5	0.0	0.0	0.0				
14/06/2024 12:22												Dry
21/06/2024 10:46	974 / 0.00	14								0.0		
21/06/2024 10:47	974 / 0.00									0.0		
21/06/2024 10:48	974 / 0.00									0.0		
21/06/2024 10:49	974 / 0.00									0.0		
21/06/2024 10:50	974 / 0.00									0.0		
21/06/2024 10:51	974 / 0.00									0.0		
21/06/2024 10:52			1.0	0.0	18.8	0.0	0.0	0.0				
21/06/2024 10:53			0.2	0.0	20.4	0.0	0.0	0.0				
21/06/2024 10:54			0.2	0.0	20.3	0.0	0.0	0.0				
21/06/2024 10:55			0.2	0.0	20.4	0.0	0.0	0.0				
21/06/2024 10:56			0.2	0.0	20.4	0.0	0.0	0.0				
21/06/2024 10:57			0.2	0.0	20.3	0.0	0.0	0.0				
21/06/2024 10:58												Dry
28/06/2024 11:41	977 / 0.00	15								0.0		
28/06/2024 11:42	977 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH303B**

INSTALLED PIPE DEPTH (m) 2.40

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
28/06/2024 11:43	977 / 0.00									0.0		
28/06/2024 11:44	977 / 0.00									0.0		
28/06/2024 11:45	977 / 0.00									0.0		
28/06/2024 11:46	977 / 0.00									0.0		
28/06/2024 11:47			1.0	0.0	19.3	0.0	0.0	0.0				
28/06/2024 11:48			0.2	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:49			0.2	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:50			0.2	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:51			0.2	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:52			0.1	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:53			0.1	0.0	20.4	0.0	0.0	0.0				
28/06/2024 11:54												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 14:02	974 / 0.00	17								0.0		
17/05/2024 14:03	974 / 0.00									0.0		
17/05/2024 14:04	974 / 0.00									0.0		
17/05/2024 14:05	974 / 0.00									0.0		
17/05/2024 14:06	974 / 0.00									0.0		
17/05/2024 14:10			4.8	0.0	9.4	0.0	0.0	10.0				
17/05/2024 14:11			4.8	0.0	9.3	0.0	0.0	10.0				
17/05/2024 14:12			4.9	0.0	9.2	0.0	0.0	10.0				
17/05/2024 14:13			4.9	0.0	9.1	0.0	0.0	10.0				
17/05/2024 14:14			4.9	0.0	9.1	0.0	0.0	10.0				
17/05/2024 14:15			4.9	0.0	9.0	0.0	0.0	10.0				
17/05/2024 14:16			5.0	0.0	8.9	0.0	0.0	10.0				
17/05/2024 14:17			5.0	0.0	8.9	0.0	0.0	10.0				
17/05/2024 14:18			5.0	0.0	8.8	0.0	0.0	10.0				
17/05/2024 14:19			5.0	0.0	8.8	0.0	0.0	10.0				
17/05/2024 14:20												Dry
23/05/2024 13:31	980 / 0.00	13								0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 13:32	980 / 0.00									0.0		
23/05/2024 13:33	980 / 0.00									0.0		
23/05/2024 13:34	980 / 0.00									0.0		
23/05/2024 13:35	980 / 0.00									0.0		
23/05/2024 13:36			7.2	0.0	9.7	0.0	0.0	0.0				
23/05/2024 13:37			7.2	0.0	9.5	0.0	0.0	0.0				
23/05/2024 13:38			7.3	0.0	9.4	0.0	0.0	0.0				
23/05/2024 13:39			7.4	0.0	9.4	0.0	0.0	0.0				
23/05/2024 13:40			7.4	0.0	9.3	0.0	0.0	0.0				
23/05/2024 13:41			7.5	0.0	9.2	0.0	0.0	0.0				
23/05/2024 13:42			7.5	0.0	9.2	0.0	0.0	0.0				
23/05/2024 13:43			7.4	0.0	9.2	0.0	0.0	0.0				
23/05/2024 13:44			7.4	0.0	9.2	0.0	0.0	0.0				
23/05/2024 13:45			7.4	0.0	9.2	0.0	0.0	0.0				
23/05/2024 13:46												Dry
31/05/2024 13:06	984 / 0.00	18								0.0		
31/05/2024 13:07	984 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 13:08	984 / 0.00									0.0		
31/05/2024 13:09	984 / 0.00									0.0		
31/05/2024 13:10	984 / 0.00									0.0		
31/05/2024 13:11	984 / 0.00									0.0		
31/05/2024 13:12			0.1	0.0	21.1	0.0	0.0	0.0				
31/05/2024 13:13			7.0	0.0	8.7	0.0	0.0	0.0				
31/05/2024 13:14			7.0	0.0	8.5	0.0	0.0	0.0				
31/05/2024 13:15			7.0	0.0	8.5	0.0	0.0	0.0				
31/05/2024 13:16			6.9	0.0	8.6	0.0	0.0	0.0				
31/05/2024 13:17			6.9	0.0	8.6	0.0	0.0	0.0				
31/05/2024 13:18												Dry
14/06/2024 14:39	963 / 0.01	14								0.0		
14/06/2024 14:40	963 / 0.05									0.1		
14/06/2024 14:41	963 / 0.03									0.1		
14/06/2024 14:42	963 / 0.05									0.1		
14/06/2024 14:43	963 / 0.03									0.1		
14/06/2024 14:44	963 / 0.03									0.1		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/06/2024 14:45			1.2	0.0	3.5	0.0	0.0	0.0				
14/06/2024 14:46			5.0	0.0	15.2	0.0	0.0	0.0				
14/06/2024 14:47			5.1	0.0	15.3	0.0	0.0	0.0				
14/06/2024 14:48			5.1	0.0	15.2	0.0	0.0	0.0				
14/06/2024 14:49			5.5	0.0	15.0	0.0	0.0	0.0				
14/06/2024 14:50			5.8	0.0	14.7	0.0	0.0	0.0				
14/06/2024 14:51			5.9	0.0	14.6	0.0	0.0	0.0				
14/06/2024 14:52												Dry
21/06/2024 12:40	978 / 0.00	16								0.0		
21/06/2024 12:41	978 / 0.00									0.0		
21/06/2024 12:42	978 / 0.00									0.0		
21/06/2024 12:43	978 / 0.00									0.0		
21/06/2024 12:44	978 / 0.00									0.0		
21/06/2024 12:45	978 / 0.00									0.0		
21/06/2024 12:46			1.6	0.0	9.0	0.0	0.0	0.0				
21/06/2024 12:47			4.7	0.0	13.9	0.0	0.0	0.0				
21/06/2024 12:48			4.8	0.0	13.8	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 12:49			5.0	0.0	13.5	0.0	0.0	0.0				
21/06/2024 12:50			5.3	0.0	13.1	0.0	0.0	0.0				
21/06/2024 12:51			5.7	0.0	12.8	0.0	0.0	0.0				
21/06/2024 12:52			5.9	0.0	12.6	0.0	0.0	0.0				
21/06/2024 12:53												Dry
28/06/2024 13:15	979 / 0.00	15								0.0		
28/06/2024 13:16	979 / 0.00									0.0		
28/06/2024 13:17	979 / 0.00									0.0		
28/06/2024 13:18	979 / 0.00									0.0		
28/06/2024 13:19	979 / 0.00									0.0		
28/06/2024 13:20	979 / 0.00									0.0		
28/06/2024 13:21			1.5	0.0	8.4	0.0	0.0	0.0				
28/06/2024 13:22			5.6	0.0	15.2	0.0	0.0	0.0				
28/06/2024 13:23			5.9	0.0	15.1	0.0	0.0	0.0				
28/06/2024 13:24			6.0	0.0	15.0	0.0	0.0	0.0				
28/06/2024 13:25			6.1	0.0	14.9	0.0	0.0	0.0				
28/06/2024 13:26			6.2	0.0	14.7	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH304**

INSTALLED PIPE DEPTH (m) 3.60

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
28/06/2024 13:27												Dry

remarks

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VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH305**

INSTALLED PIPE DEPTH (m) 3.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 13:40	973 / -0.02	17								-0.3		
17/05/2024 13:41	973 / -0.02									-0.3		
17/05/2024 13:42	973 / -0.02									-0.3		
17/05/2024 13:43	973 / -0.02									-0.3		
17/05/2024 13:44	973 / -0.02									-0.3		
17/05/2024 13:45			0.6	0.0	19.9	0.0	0.0	0.0				
17/05/2024 13:46			0.6	0.0	19.8	0.0	0.0	0.0				
17/05/2024 13:47			0.6	0.0	19.8	0.0	0.0	0.0				
17/05/2024 13:48			0.6	0.0	19.8	0.0	0.0	0.0				
17/05/2024 13:49			0.6	0.0	19.8	0.0	0.0	0.0				
17/05/2024 13:50												Dry
23/05/2024 13:05	978 / 0.00	13								0.0		Peak DP =5, Peak flow = 0.3, lasted 2 seconds at start of monitoring
23/05/2024 13:06	978 / 0.00									0.0		
23/05/2024 13:07	978 / 0.00									0.0		
23/05/2024 13:08	978 / 0.00									0.0		
23/05/2024 13:09	978 / 0.00									0.0		
23/05/2024 13:10			0.5	0.0	19.8	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
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Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH305**

INSTALLED PIPE DEPTH (m) 3.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 13:11			0.5	0.0	19.8	0.0	0.0	0.0				
23/05/2024 13:12			0.5	0.0	19.8	0.0	0.0	0.0				
23/05/2024 13:13			0.5	0.0	19.8	0.0	0.0	0.0				
23/05/2024 13:14			0.5	0.0	19.8	0.0	0.0	0.0				
23/05/2024 13:15			0.5	0.0	19.8	0.0	0.0	0.0				
23/05/2024 13:16												Dry
31/05/2024 12:45	983 / 0.00	18								0.0		
31/05/2024 12:46	983 / 0.00									0.0		
31/05/2024 12:47	983 / 0.00									0.0		
31/05/2024 12:48	983 / 0.00									0.0		
31/05/2024 12:49	983 / 0.00									0.0		
31/05/2024 12:50	983 / 0.00									0.0		
31/05/2024 12:51			0.2	0.0	20.1	0.0	0.0	0.0				
31/05/2024 12:52			0.5	0.0	20.7	0.0	0.0	0.0				
31/05/2024 12:53			0.5	0.0	20.7	0.0	0.0	0.0				
31/05/2024 12:54			0.5	0.0	20.6	0.0	0.0	0.0				
31/05/2024 12:55			0.5	0.0	20.6	0.0	0.0	0.0				

remarks

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VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH305**

INSTALLED PIPE DEPTH (m) 3.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 12:56			0.5	0.0	20.6	0.0	0.0	0.0				
31/05/2024 12:57												Dry
14/06/2024 13:30	966 / 0.00	14								0.0		
14/06/2024 13:31	965 / 0.04									0.1		
14/06/2024 13:32	965 / 0.07									0.1		
14/06/2024 13:33	965 / 0.10									0.3		
14/06/2024 13:34	965 / 0.12									0.3		
14/06/2024 13:35	965 / 0.12									0.3		
14/06/2024 13:36			0.5	0.0	18.6	0.0	0.0	0.0				
14/06/2024 13:37			0.5	0.0	19.5	0.0	0.0	0.0				
14/06/2024 13:38			0.5	0.0	19.5	0.0	0.0	0.0				
14/06/2024 13:39			0.5	0.0	19.5	0.0	0.0	0.0				
14/06/2024 13:40			0.4	0.0	19.5	0.0	0.0	0.0				
14/06/2024 13:41			0.4	0.0	19.5	0.0	0.0	0.0				
14/06/2024 13:42												Dry
21/06/2024 11:46	977 / 0.00	15								0.0		
21/06/2024 11:47	977 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH305**

INSTALLED PIPE DEPTH (m) 3.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 11:48	977 / 0.00									0.0		
21/06/2024 11:49	977 / 0.00									0.0		
21/06/2024 11:50	977 / 0.00									0.0		
21/06/2024 11:51	977 / 0.00									0.0		
21/06/2024 11:52			0.6	0.0	19.6	0.0	0.0	0.0				
21/06/2024 11:53			0.7	0.0	20.3	0.0	0.0	0.0				
21/06/2024 11:54			0.7	0.0	20.3	0.0	0.0	0.0				
21/06/2024 11:55			0.7	0.0	20.3	0.0	0.0	0.0				
21/06/2024 11:56			0.7	0.0	20.3	0.0	0.0	0.0				
21/06/2024 11:57			0.7	0.0	20.3	0.0	0.0	0.0				
21/06/2024 11:58												Dry
28/06/2024 12:29	979 / 0.00	16								0.0		
28/06/2024 12:30	979 / 0.00									0.0		
28/06/2024 12:31	979 / 0.00									0.0		
28/06/2024 12:32	979 / 0.00									0.0		
28/06/2024 12:33	979 / 0.00									0.0		
28/06/2024 12:34	979 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH305**

INSTALLED PIPE DEPTH (m) 3.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
28/06/2024 12:35			0.5	0.0	19.2	0.0	0.0	0.0				
28/06/2024 12:36			0.5	0.0	20.5	0.0	0.0	0.0				
28/06/2024 12:37			0.5	0.0	20.5	0.0	0.0	0.0				
28/06/2024 12:38			0.5	0.0	20.5	0.0	0.0	0.0				
28/06/2024 12:39			0.5	0.0	20.5	0.0	0.0	0.0				
28/06/2024 12:40			0.5	0.0	20.5	0.0	0.0	0.0				
28/06/2024 12:41			0.5	0.0	20.6	0.0	0.0	0.0				
28/06/2024 12:42												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH306**

INSTALLED PIPE DEPTH (m) 8.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 13:17	972 / 0.00	17								0.0		
17/05/2024 13:18	972 / 0.00									0.0		
17/05/2024 13:19	972 / 0.00									0.0		
17/05/2024 13:20	972 / 0.00									0.0		
17/05/2024 13:21	972 / 0.00									0.0		
17/05/2024 13:22			0.5	0.0	18.9	0.0	0.0	0.0				
17/05/2024 13:23			0.5	0.0	18.9	0.0	0.0	0.0				
17/05/2024 13:24			0.5	0.0	18.9	0.0	0.0	0.0				
17/05/2024 13:25			0.5	0.0	18.8	0.0	0.0	0.0				
17/05/2024 13:26			0.5	0.0	18.8	0.0	0.0	0.0				
17/05/2024 13:27												Dry
23/05/2024 12:00												Headworks flooded, gas monitoring terminated due to water uptake. Instllation pipe dry.
31/05/2024 12:06	985 / 0.00	18								0.0		
31/05/2024 12:07	985 / 0.00									0.0		
31/05/2024 12:08	985 / 0.00									0.0		
31/05/2024 12:09	985 / 0.00									0.0		
31/05/2024 12:10	985 / 0.00									0.0		

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
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Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH306**

INSTALLED PIPE DEPTH (m) 8.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 12:11	985 / 0.00									0.0		
31/05/2024 12:12			0.5	0.0	19.1	0.0	0.0	0.0				
31/05/2024 12:13			0.6	0.0	18.5	0.0	0.0	0.0				
31/05/2024 12:14			0.6	0.0	18.4	0.0	0.0	0.0				
31/05/2024 12:15			0.6	0.0	18.4	0.0	0.0	0.0				
31/05/2024 12:16			0.6	0.0	18.4	0.0	0.0	0.0				
31/05/2024 12:17			0.6	0.0	18.4	0.0	0.0	0.0				
31/05/2024 12:18			0.6	0.0	18.4	0.0	0.0	0.0				
31/05/2024 12:19												Dry
14/06/2024 12:42	962 / 0.04	13								0.1		
14/06/2024 12:43	963 / 0.02									0.0		
14/06/2024 12:44	963 / 0.02									0.0		
14/06/2024 12:45	963 / 0.02									0.0		
14/06/2024 12:46	963 / 0.02									0.0		
14/06/2024 12:47	963 / 0.02									0.0		
14/06/2024 12:48			0.5	0.0	19.7	0.0	0.0	0.0				
14/06/2024 12:49			0.7	0.0	17.6	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH306**

INSTALLED PIPE DEPTH (m) 8.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/06/2024 12:50			0.7	0.0	17.5	0.0	0.0	0.0				
14/06/2024 12:51			0.7	0.0	17.5	0.0	0.0	0.0				
14/06/2024 12:52			0.7	0.0	17.5	0.0	0.0	0.0				
14/06/2024 12:53			0.7	0.0	17.5	0.0	0.0	0.0				
14/06/2024 12:54												Dry
21/06/2024 11:24	978 / 0.00	15								0.0		
21/06/2024 11:25	978 / 0.00									0.0		
21/06/2024 11:26	978 / 0.00									0.0		
21/06/2024 11:27	978 / 0.00									0.0		
21/06/2024 11:28	978 / 0.00									0.0		
21/06/2024 11:29	978 / 0.00									0.0		
21/06/2024 11:30			0.2	0.0	21.0	0.0	0.0	0.0				
21/06/2024 11:31			0.7	0.0	19.2	0.0	0.0	0.0				
21/06/2024 11:32			0.7	0.0	19.1	0.0	0.0	0.0				
21/06/2024 11:33			0.7	0.0	19.1	0.0	0.0	0.0				
21/06/2024 11:34			0.7	0.0	19.1	0.0	0.0	0.0				
21/06/2024 11:35			0.7	0.0	19.0	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH306**

INSTALLED PIPE DEPTH (m) 8.20

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 11:36												Dry
28/06/2024 12:03	980 / 0.00	15								0.0		
28/06/2024 12:04	980 / 0.00									0.0		
28/06/2024 12:05	980 / 0.00									0.0		
28/06/2024 12:06	980 / 0.00									0.0		
28/06/2024 12:07	980 / 0.00									0.0		
28/06/2024 12:08	980 / 0.00									0.0		
28/06/2024 12:09			0.4	0.0	20.8	0.0	0.0	0.0				
28/06/2024 12:10			0.7	0.0	18.7	0.0	0.0	0.0				
28/06/2024 12:11			0.7	0.0	18.5	0.0	0.0	0.0				
28/06/2024 12:12			0.7	0.0	18.5	0.0	0.0	0.0				
28/06/2024 12:13			0.7	0.0	18.5	0.0	0.0	0.0				
28/06/2024 12:14			0.7	0.0	18.4	0.0	0.0	0.0				
28/06/2024 12:15												Dry

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH307**

INSTALLED PIPE DEPTH (m) 9.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
17/05/2024 15:00											2.50	Gas monitoring not undertaken, gas tap replaced due to damage.
23/05/2024 14:17	982 / 0.00	13								0.0		Headworks flooded, water bailed out.
23/05/2024 14:18	982 / 0.00									0.0		
23/05/2024 14:19	982 / 0.00									0.0		
23/05/2024 14:20	982 / 0.00									0.0		
23/05/2024 14:21	982 / 0.00									0.0		
23/05/2024 14:22			0.9	0.0	5.9	0.0	0.0	0.0				
23/05/2024 14:23			0.9	0.0	6.1	0.0	0.0	0.0				
23/05/2024 14:24			0.9	0.0	6.3	0.0	0.0	0.0				
23/05/2024 14:25			0.9	0.0	6.4	0.0	0.0	0.0				
23/05/2024 14:26			0.9	0.0	6.4	0.0	0.0	0.0				
23/05/2024 14:27			0.9	0.0	6.3	0.0	0.0	0.0				
23/05/2024 14:28			0.9	0.0	6.1	0.0	0.0	0.0				
23/05/2024 14:29			0.9	0.0	5.9	0.0	0.0	0.0				
23/05/2024 14:30			0.9	0.0	5.6	0.0	0.0	0.0				
23/05/2024 14:31			1.0	0.0	5.3	0.0	0.0	0.0				
23/05/2024 14:32			1.0	0.0	5.0	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH307**

INSTALLED PIPE DEPTH (m) 9.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
23/05/2024 14:33			1.0	0.0	4.7	0.0	0.0	0.0				
23/05/2024 14:34			1.0	0.0	4.9	0.0	0.0	0.0				
23/05/2024 14:35			1.1	0.0	4.1	0.0	0.0	0.0				
23/05/2024 14:36			1.2	0.0	3.9	0.0	0.0	0.0				
23/05/2024 14:37											2.58	
31/05/2024 13:24	989 / 0.00	18								0.0		
31/05/2024 13:25	989 / 0.00									0.0		
31/05/2024 13:26	989 / 0.00									0.0		
31/05/2024 13:27	989 / 0.00									0.0		
31/05/2024 13:28	989 / 0.00									0.0		
31/05/2024 13:29	989 / 0.00									0.0		
31/05/2024 13:30			1.2	0.0	4.6	0.0	0.0	0.0				
31/05/2024 13:31			1.1	0.0	1.3	0.0	0.0	0.0				
31/05/2024 13:32			1.1	0.0	1.3	0.0	0.0	0.0				
31/05/2024 13:33			1.1	0.0	1.3	0.0	0.0	0.0				
31/05/2024 13:34			1.1	0.0	1.2	0.0	0.0	0.0				
31/05/2024 13:35			1.2	0.0	1.0	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH307**

INSTALLED PIPE DEPTH (m) 9.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
31/05/2024 13:36			1.3	0.0	1.0	0.0	0.0	0.0				
31/05/2024 13:37			1.3	0.0	0.9	0.0	0.0	0.0				
31/05/2024 13:38			1.4	0.0	0.9	0.0	0.0	0.0				
31/05/2024 13:39			1.4	0.0	0.9	0.0	0.0	0.0				
31/05/2024 13:40											2.50	
14/06/2024 14:06	966 / 0.00	14								0.0		
14/06/2024 14:07	966 / 0.00									0.0		
14/06/2024 14:08	966 / 0.02									0.0		
14/06/2024 14:09	966 / 0.04									0.1		
14/06/2024 14:10	966 / 0.00									0.0		
14/06/2024 14:11	966 / 0.02									0.0		
14/06/2024 14:12			0.6	0.0	16.8	0.0	0.0	0.0				
14/06/2024 14:13			1.2	0.0	0.6	0.0	0.0	0.0				
14/06/2024 14:14			1.2	0.0	0.3	0.0	0.0	0.0				
14/06/2024 14:15			1.2	0.0	0.2	0.0	0.0	0.0				
14/06/2024 14:16			1.2	0.0	0.1	0.0	0.0	0.0				
14/06/2024 14:17			1.2	0.0	0.1	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH307**

INSTALLED PIPE DEPTH (m) 9.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
14/06/2024 14:18			1.2	0.0	0.0	0.0	0.0	0.0				
14/06/2024 14:19			1.2	0.0	0.0	0.0	0.0	0.0				
14/06/2024 14:20			1.2	0.0	0.0	0.0	0.0	0.0				
14/06/2024 14:21			1.2	0.0	0.0	0.0	0.0	0.0				
14/06/2024 14:22			1.2	0.0	0.0	0.0	0.0	0.0				
14/06/2024 14:23											4.31	
21/06/2024 12:08	981 / 0.00	14								0.0		
21/06/2024 12:09	981 / 0.00									0.0		
21/06/2024 12:10	981 / 0.00									0.0		
21/06/2024 12:11	981 / 0.00									0.0		
21/06/2024 12:12	981 / 0.00									0.0		
21/06/2024 12:13	981 / 0.00									0.0		
21/06/2024 12:14			0.6	0.0	20.1	0.0	0.0	0.0				
21/06/2024 12:15			1.0	0.0	2.5	0.0	0.0	0.0				
21/06/2024 12:16			1.1	0.0	0.5	0.0	0.0	0.0				
21/06/2024 12:17			1.1	0.0	0.2	0.0	0.0	0.0				
21/06/2024 12:18			1.1	0.0	0.2	0.0	0.0	0.0				

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

Geotechnical Engineering Limited

GAS AND GROUNDWATER LEVELS

CLIENT: TRIVALLIS

SITE: PENRHYS VILLAGE, RHONDDA CYNON TAFF

LOCATION ID **BH307**

INSTALLED PIPE DEPTH (m) 9.50

PIPE DIAMETER (mm) 50

date and time	barometric pressure / differentiation (mb)	termperature (°C)	carbon dioxide (%)	methane (%)	oxygen (%)	LEL (%)	hydrogen sulphide (ppm)	carbon monoxide (ppm)	VOC (ppm)	gas flow (ltr/hr)	water level (m - bgl)	remarks
21/06/2024 12:19			1.0	0.0	0.1	0.0	0.0	0.0				
21/06/2024 12:20			1.0	0.0	0.1	0.0	0.0	0.0				
21/06/2024 12:21											4.60	
28/06/2024 12:53	983 / 0.00	15								0.0		
28/06/2024 12:54	983 / 0.00									0.0		
28/06/2024 12:55	983 / 0.00									0.0		
28/06/2024 12:56	983 / 0.00									0.0		
28/06/2024 12:57	983 / 0.00									0.0		
28/06/2024 12:58	983 / 0.00									0.0		
28/06/2024 12:59			0.2	0.0	20.4	1.1	0.0	0.0				
28/06/2024 13:00			1.2	0.2	0.8	4.4	0.0	20.0				
28/06/2024 13:01			1.2	0.1	0.6	4.4	0.0	23.0				
28/06/2024 13:02			1.2	0.2	0.3	4.7	0.0	23.0				
28/06/2024 13:03			1.2	0.2	0.2	5.1	0.0	23.0				
28/06/2024 13:04			1.2	0.2	0.2	5.1	0.0	25.0				
28/06/2024 13:05											6.99	

remarks

# denotes results exceeding capacity of gas monitoring equipment

VOC - Photoionisation Detector Mini RAE Lite measures VOC vapours with 10.6eV lamp calibrated against isobutylene

CONTRACT	CHECKED
38113	**JH**

APPENDIX C

LABORATORY TESTING

UKAS TESTING
2718

GEOTECHNICAL ENGINEERING LIMITED

Version No.	1
Reason for update	N/A
For the attention of Brian Allen / Simon Phelpstead	Page No. 1 of 48
	Date of Issue 18/06/2024

TEST REPORT

PROJECT/SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	Samples received	17/04/2024
GEL REPORT NUMBER	38113	Schedule received	16/05/2024
Your ref/PO:		Testing commenced	20/05/2024
Test report refers to	Schedule 001	Status	Final

SUMMARY OF RESULTS ATTACHED

TEST METHOD & DESCRIPTION (S) denotes testing was subcontracted		QUANTITY	ACCREDITED TEST
BS EN ISO 17892-1: 2014:5, Water Content		5	YES
BS EN ISO 17892-12:2018, Liquid & Plastic Limits		5	YES
BS EN ISO 17892-4: 2016: 5.2, Particle Size Distribution - Wet Sieve		36	YES
BS EN ISO 17892-4: 2016: 5.4, Particle Size Distribution - Pipette		1	YES
ISRM: Suggested Methods: 2007: Water Content of Rock		4	NO
ISRM Suggested Methods: 1974-2006: Uniaxial Compressive Strength of Rock	(S)	4	YES
ISRM: Suggested Methods: 2007: Point Load Strength Test		16	YES
ISRM: Suggested Methods: 1974-2006: Point Load Strength Test	(S)	1	YES

General Remarks

This report may not be partially reproduced without written permission from this laboratory.
The results reported relate to samples received in the laboratory and the items tested.

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Approved Signatories:
W Jones (Laboratory Manager) J Hanson (Director)
T Best (Deputy Laboratory Manager) N Parry (Director)

Geotechnical Engineering Limited

LIQUID AND PLASTIC LIMITS

BS EN ISO 17892-12:2018

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
BH304	4D	0.50	0.50	14.2	BYE	47	32	21	11	Brown slightly sandy gravelly silty CLAY
BH305	3B	0.50	0.50	17.5	BYE	25	31	19	12	Brown slightly sandy slightly gravelly silty CLAY
BH306	4D	0.50	0.50	18.7	BYE	83	50	40	10	Brown sandy silty GRAVEL
TP213	3D	1.50	1.50	16.7	BYE	52	35	23	12	Brown slightly sandy gravelly silty CLAY
TP215	1B	0.50	0.50	16.8	BYE	53	38	25	13	Brown slightly sandy gravelly silty CLAY

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

# denotes sample tested is smaller than that which is recommended in accordance with BS EN ISO 17892 or BS1377

specimen preparation

A - as received
B - washed on 0.425mm sieve
C - air dried
D - oven dried (60oC)
E - oven dried (105oC)
F - not known

test method

X - cone penetrometer (4 point)
Y - cone penetrometer (1 point)
Z - casagrande apparatus

CONTRACT **38113**

CHECKED **TB**

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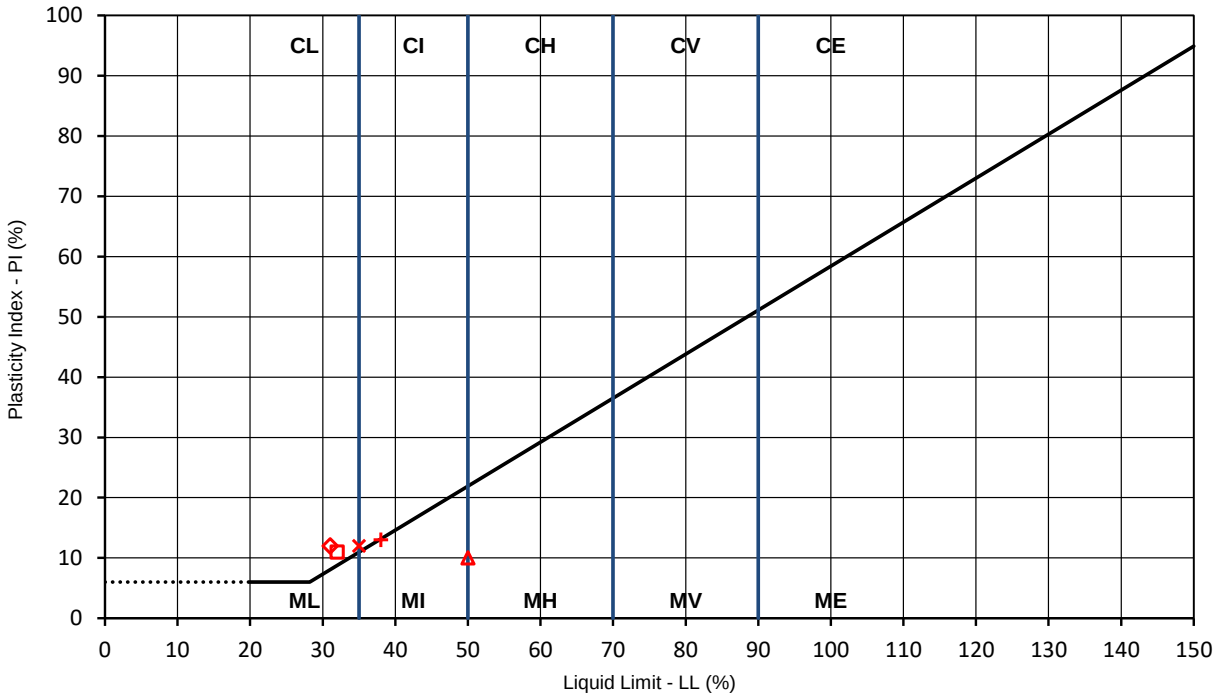
ATTERBERG LINE PLOT

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF



	BH/TP No.	depth (m)	LL	PL	PI	remarks
□	BH304	0.50	32	21	11	
◇	BH305	0.50	31	19	12	
△	BH306	0.50	50	40	10	
×	TP213	1.50	35	23	12	
+	TP215	0.50	38	25	13	

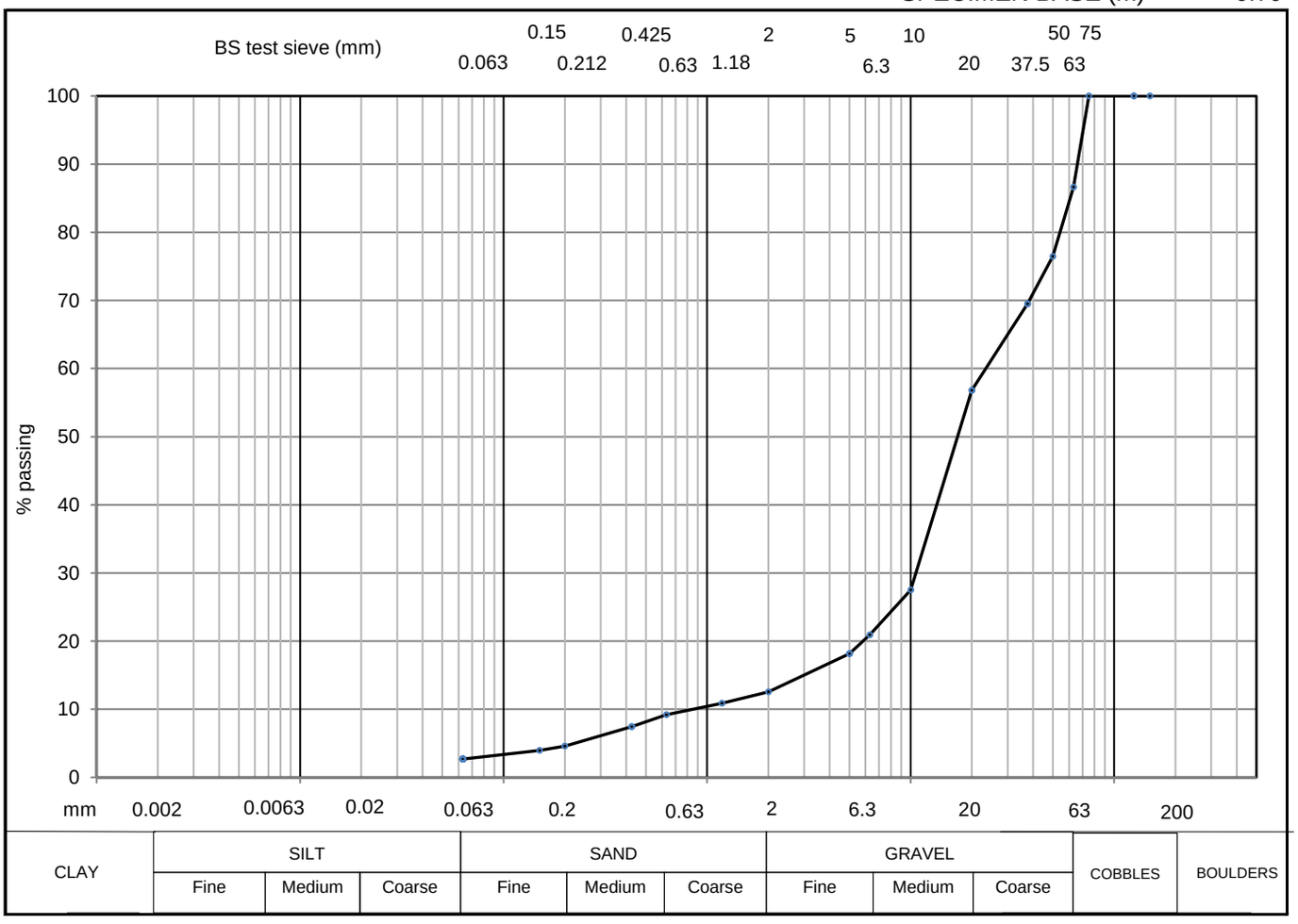
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH301
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown slightly clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	10
GRAVEL	74
COBBLE & BOULDER	13
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	18	20	
75	100	2	13	6	
63	87	1.18	11	2	
50	76	0.63	9		
37.5	70	0.425	7		
20	57	0.2	5		
10	28	0.15	4		
6.3	21	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

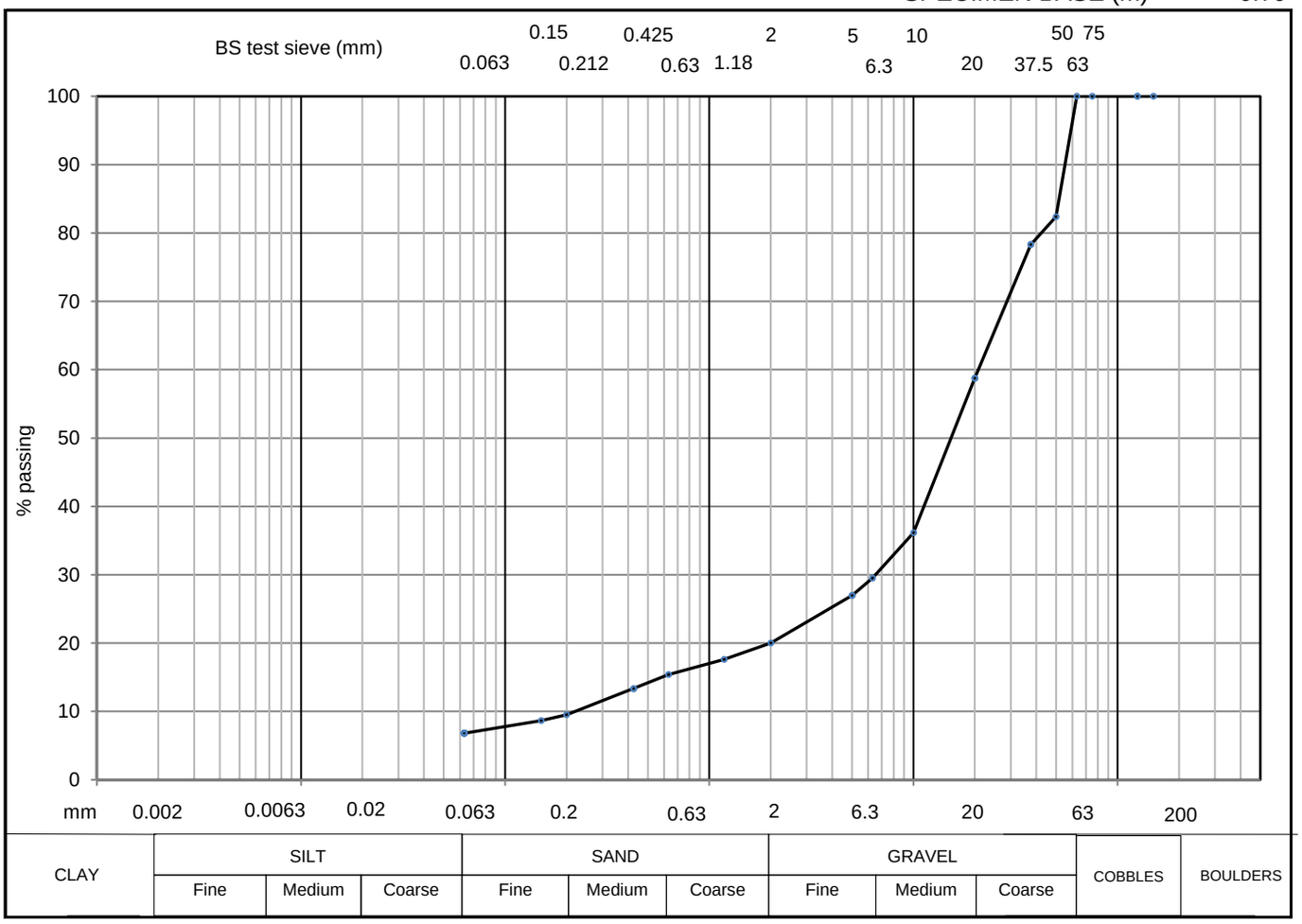
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH302B
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	13
GRAVEL	80
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	27	20	
75		2	20	6	
63	100	1.18	18	2	
50	82	0.63	15		
37.5	78	0.425	13		
20	59	0.2	10		
10	36	0.15	9		
6.3	30	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

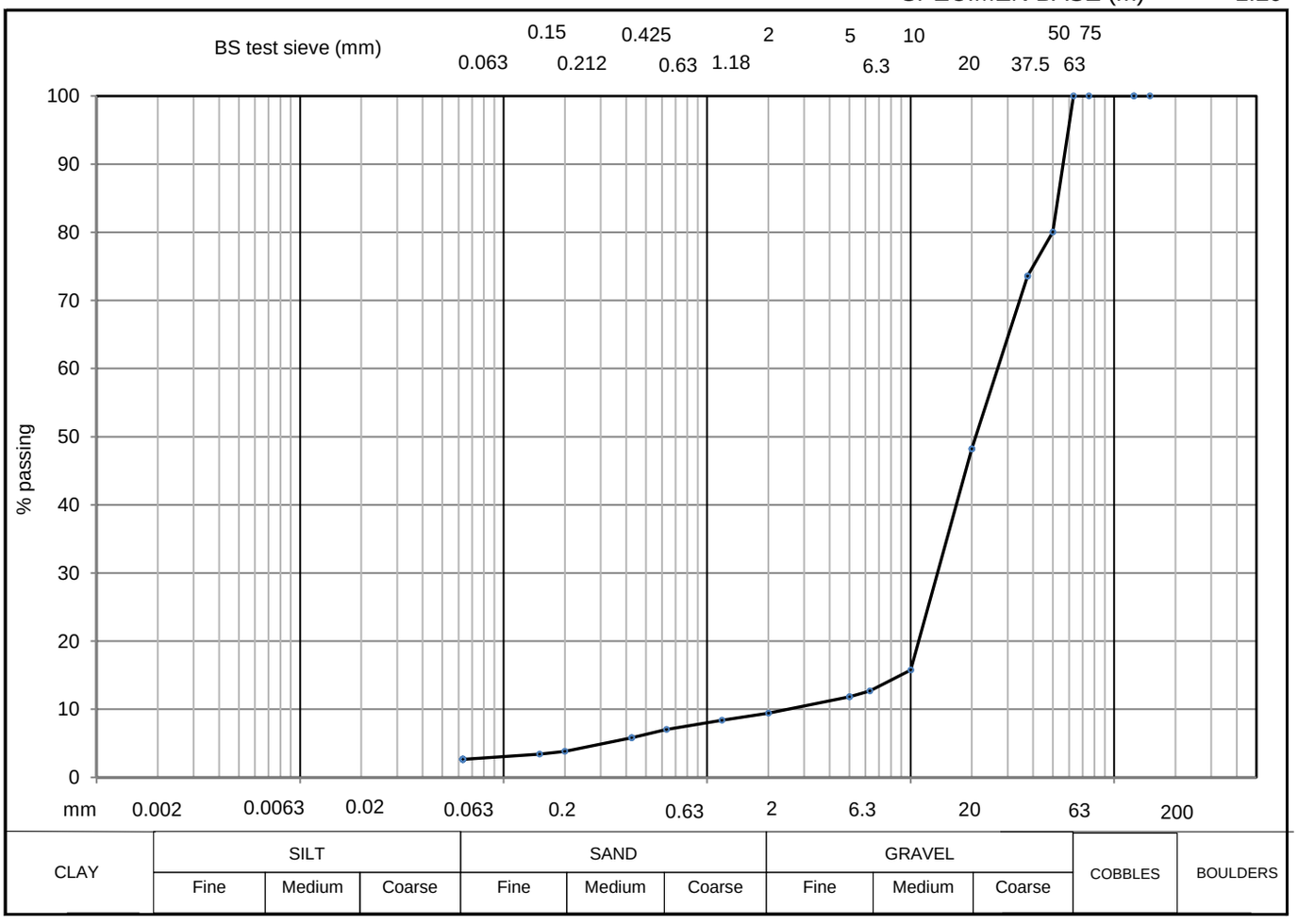
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH303B
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Grey slightly clayey sandy GRAVEL with rare wood fragments	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	7
GRAVEL	91
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	12	20	
75		2	9	6	
63	100	1.18	8	2	
50	80	0.63	7		
37.5	74	0.425	6		
20	48	0.2	4		
10	16	0.15	3		
6.3	13	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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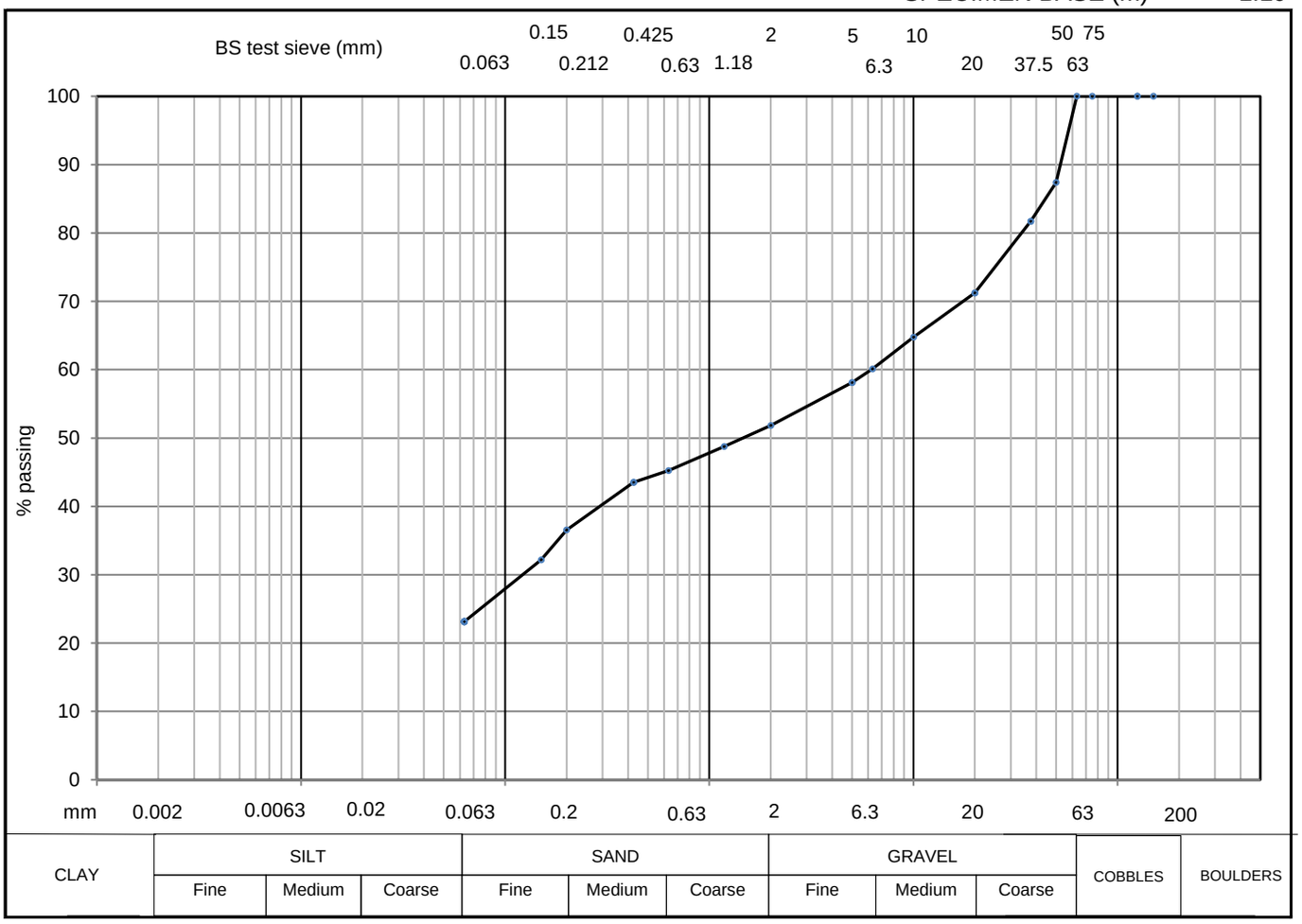
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH304
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.90
DESCRIPTION	Brown very silty very sandy GRAVEL	SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.10



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	29
GRAVEL	48
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	58	20	
75		2	52	6	
63	100	1.18	49	2	
50	87	0.63	45		
37.5	82	0.425	44		
20	71	0.2	37		
10	65	0.15	32		
6.3	60	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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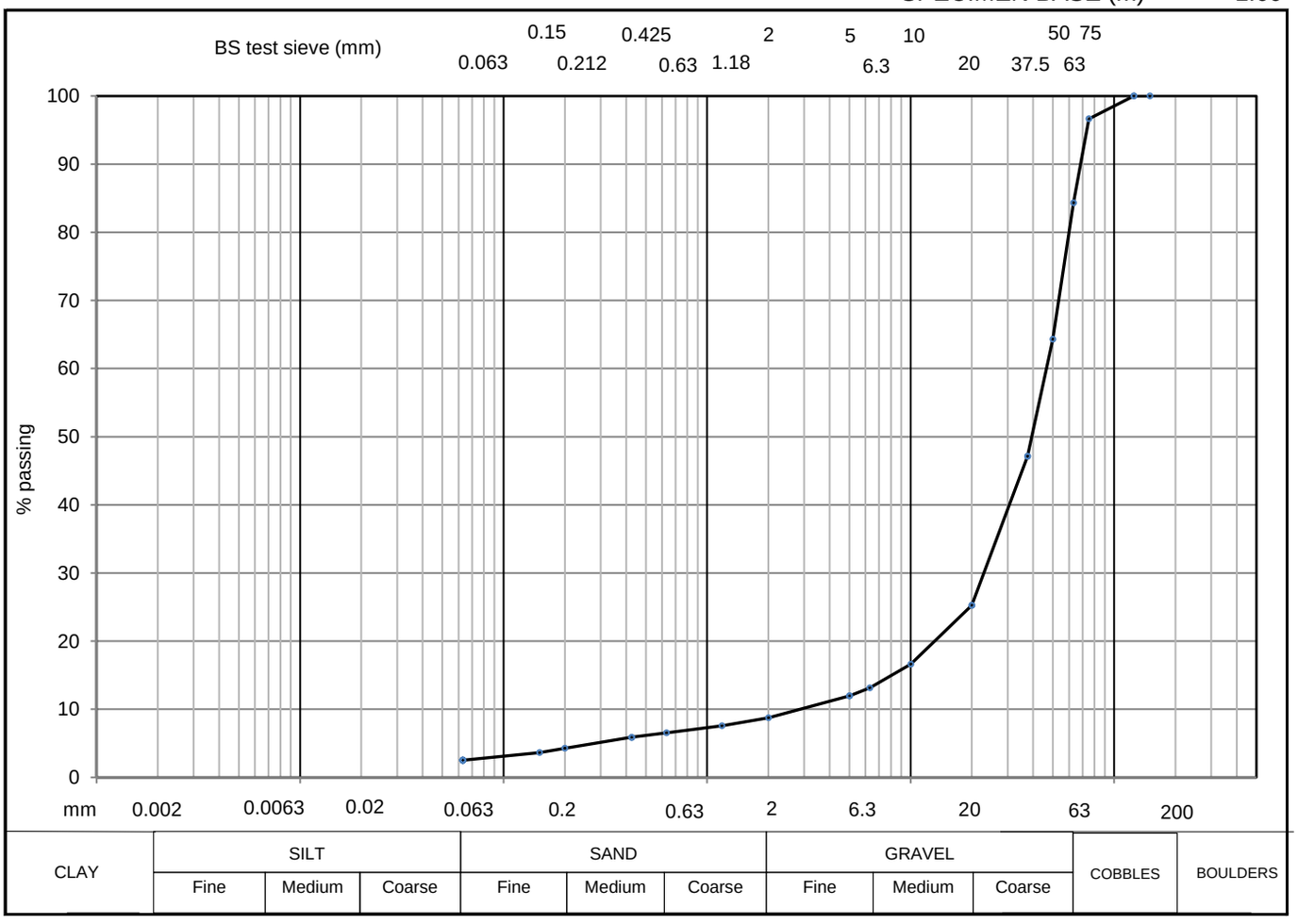
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH306
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.90
DESCRIPTION	Brown slightly silty sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.00



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	6
GRAVEL	76
COBBLE & BOULDER	16
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	12	20	
75	97	2	9	6	
63	84	1.18	8	2	
50	64	0.63	7		
37.5	47	0.425	6		
20	25	0.2	4		
10	17	0.15	4		
6.3	13	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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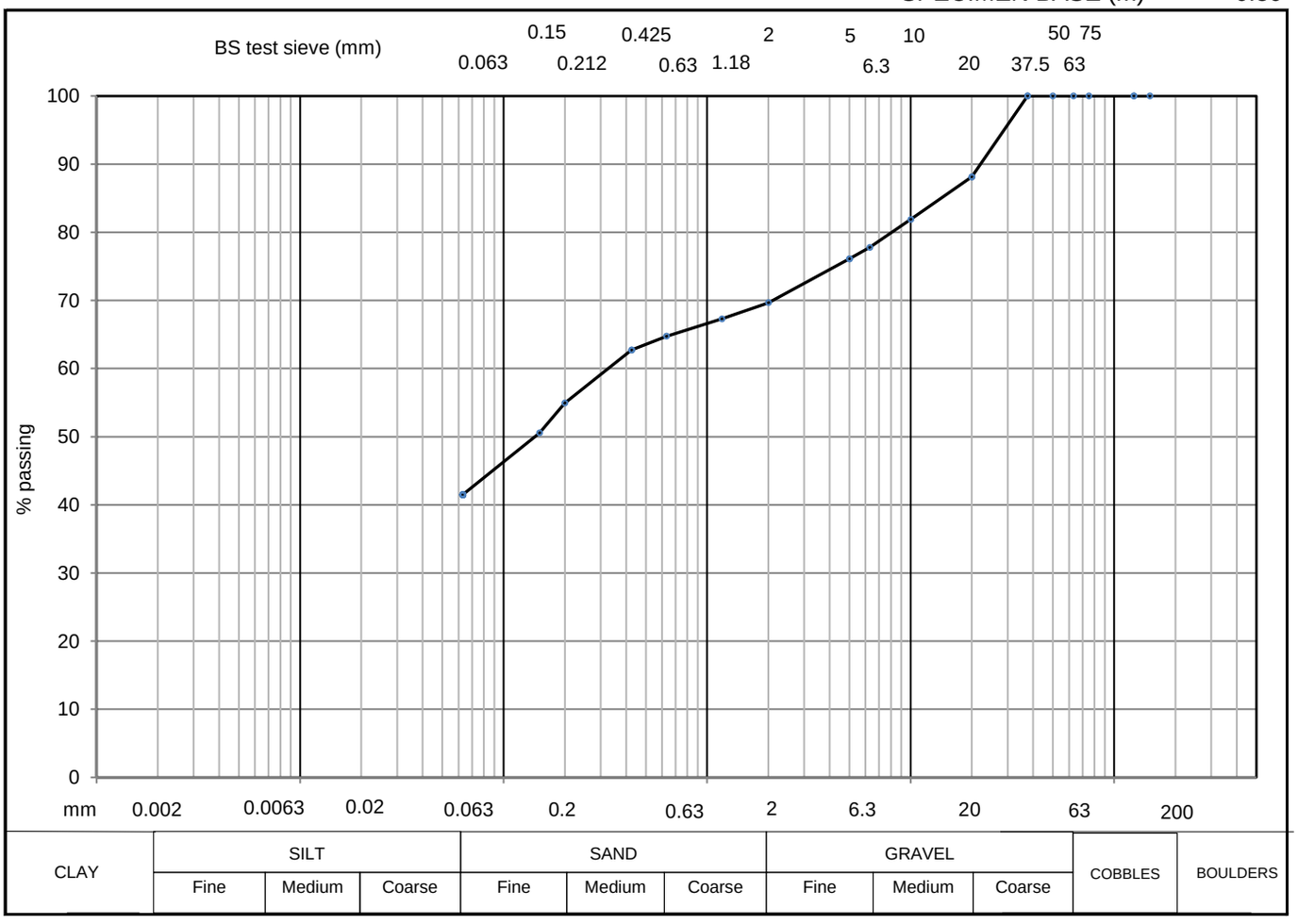
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH307
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	0.30
DESCRIPTION	Brown slightly sandy slightly gravelly CLAY	SPECIMEN TOP (m)	0.30
		SPECIMEN BASE (m)	0.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	41
SAND	28
GRAVEL	30
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	76	20	
75		2	70	6	
63		1.18	67	2	
50		0.63	65		
37.5	100	0.425	63		
20	88	0.2	55		
10	82	0.15	51		
6.3	78	0.063	41		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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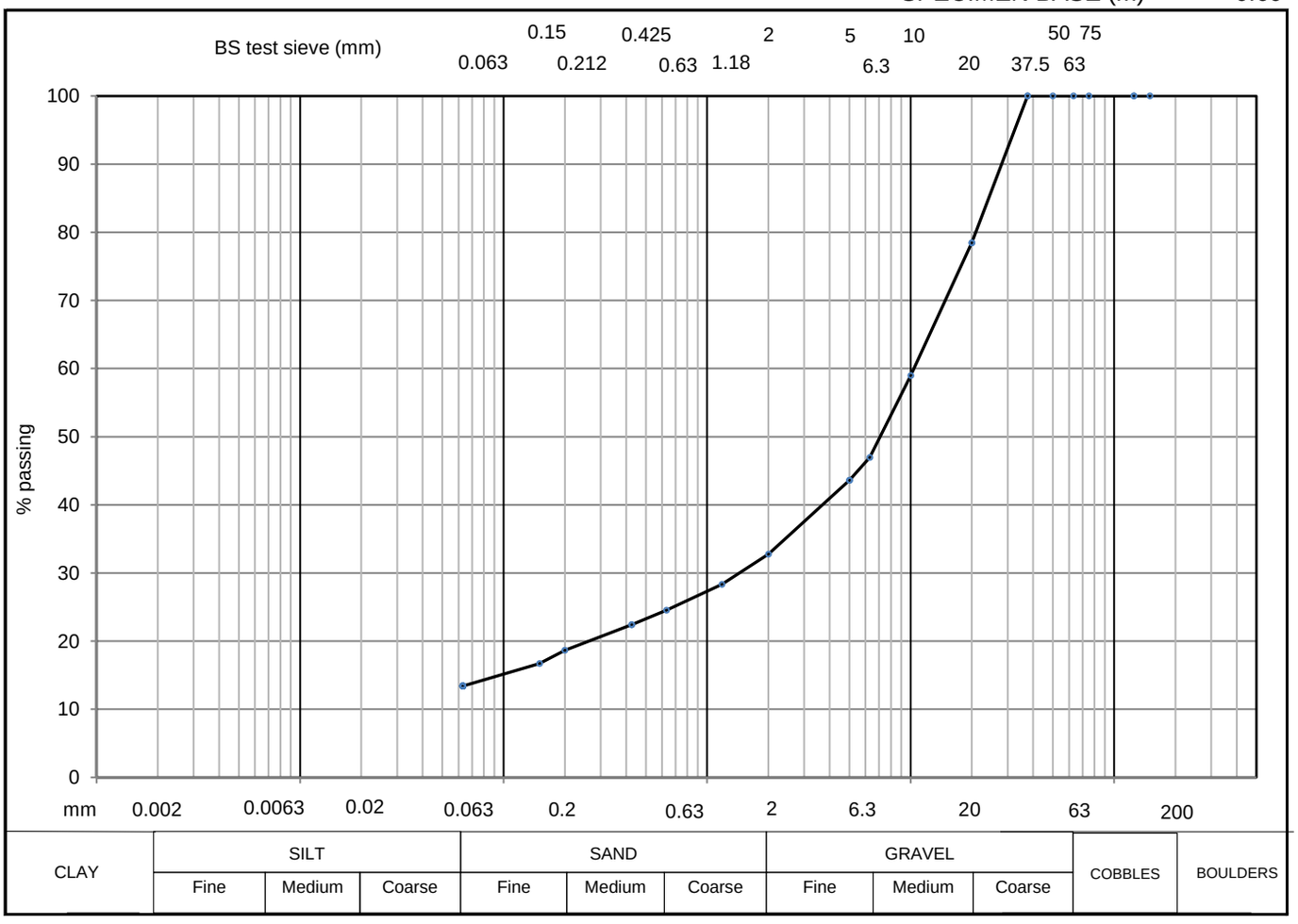
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP101
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown silty sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.60



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	13
SAND	19
GRAVEL	67
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	100
20	78
10	59
6.3	47

BS test sieve (mm)	% passing
5	44
2	33
1.18	28
0.63	25
0.425	22
0.2	19
0.15	17
0.063	13

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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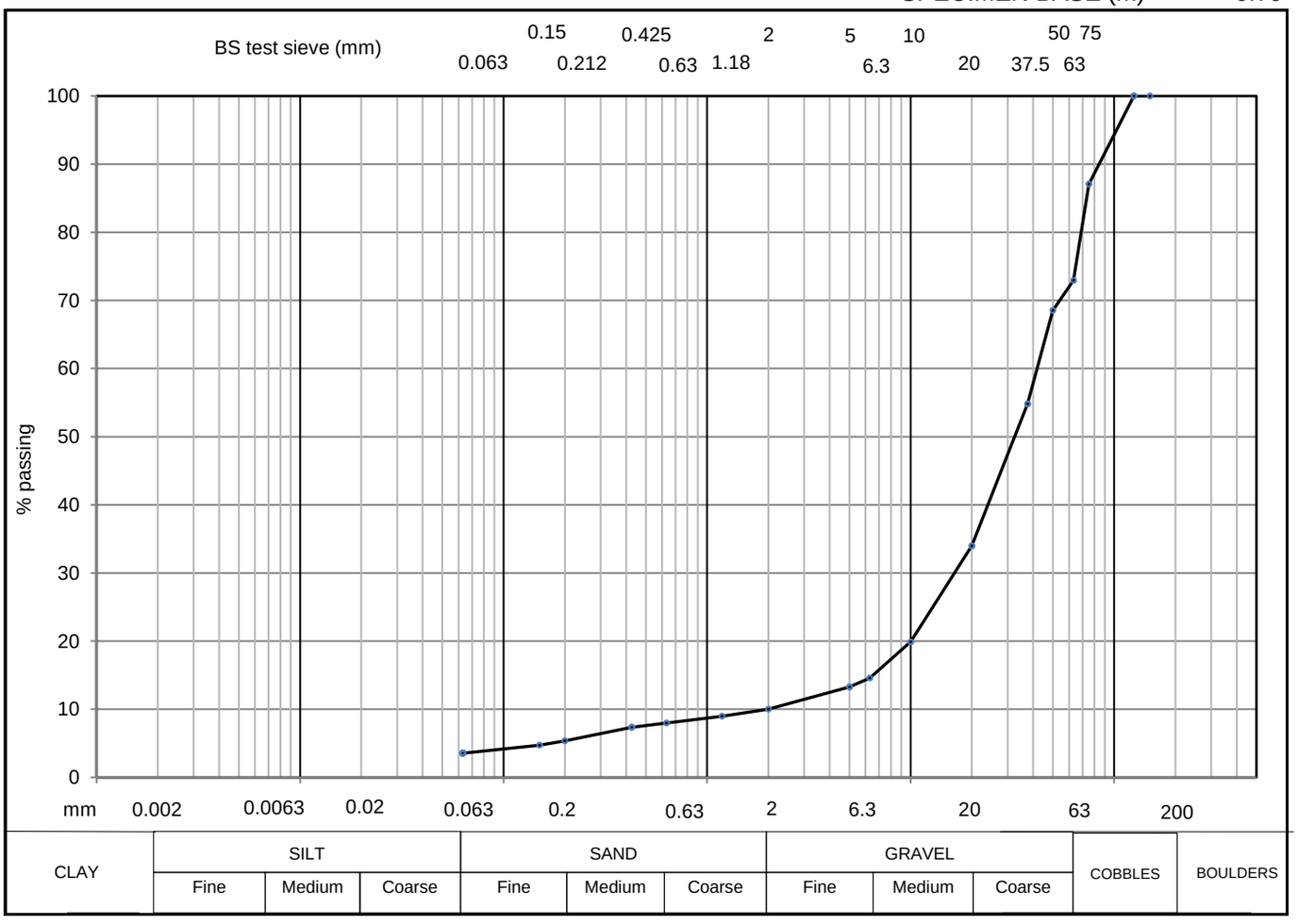
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP102
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown slightly clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	4
SAND	6
GRAVEL	63
COBBLE & BOULDER	27
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	13	20	
75	87	2	10	6	
63	73	1.18	9	2	
50	69	0.63	8		
37.5	55	0.425	7		
20	34	0.2	5		
10	20	0.15	5		
6.3	15	0.063	4		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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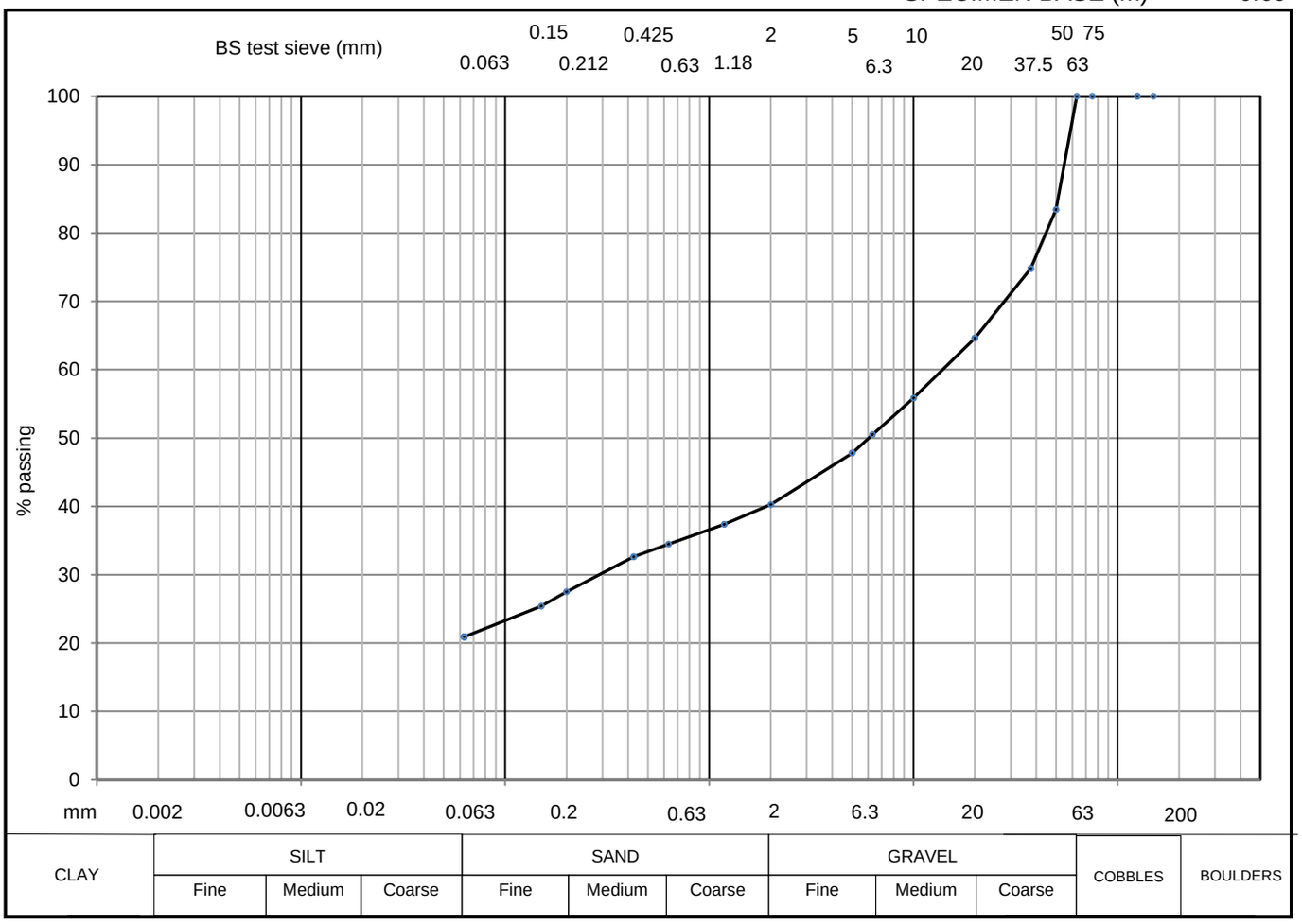
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP107
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown sandy very clayey GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.60



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	21
SAND	19
GRAVEL	60
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	48	20	
75		2	40	6	
63	100	1.18	37	2	
50	83	0.63	34		
37.5	75	0.425	33		
20	65	0.2	28		
10	56	0.15	25		
6.3	50	0.063	21		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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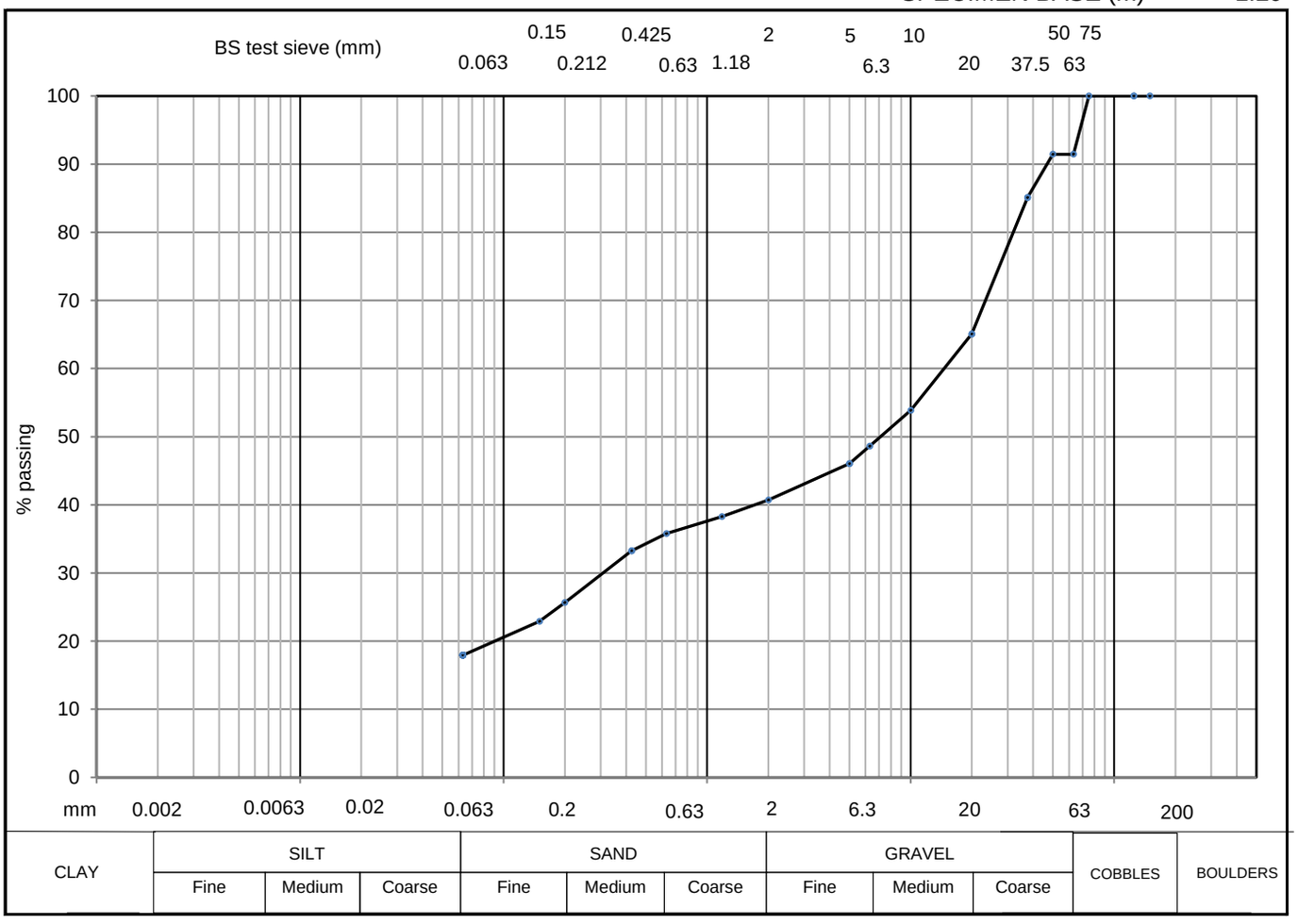
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP201
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey very sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	23
GRAVEL	51
COBBLE & BOULDER	9
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	46	20	
75	100	2	41	6	
63	91	1.18	38	2	
50	91	0.63	36		
37.5	85	0.425	33		
20	65	0.2	26		
10	54	0.15	23		
6.3	49	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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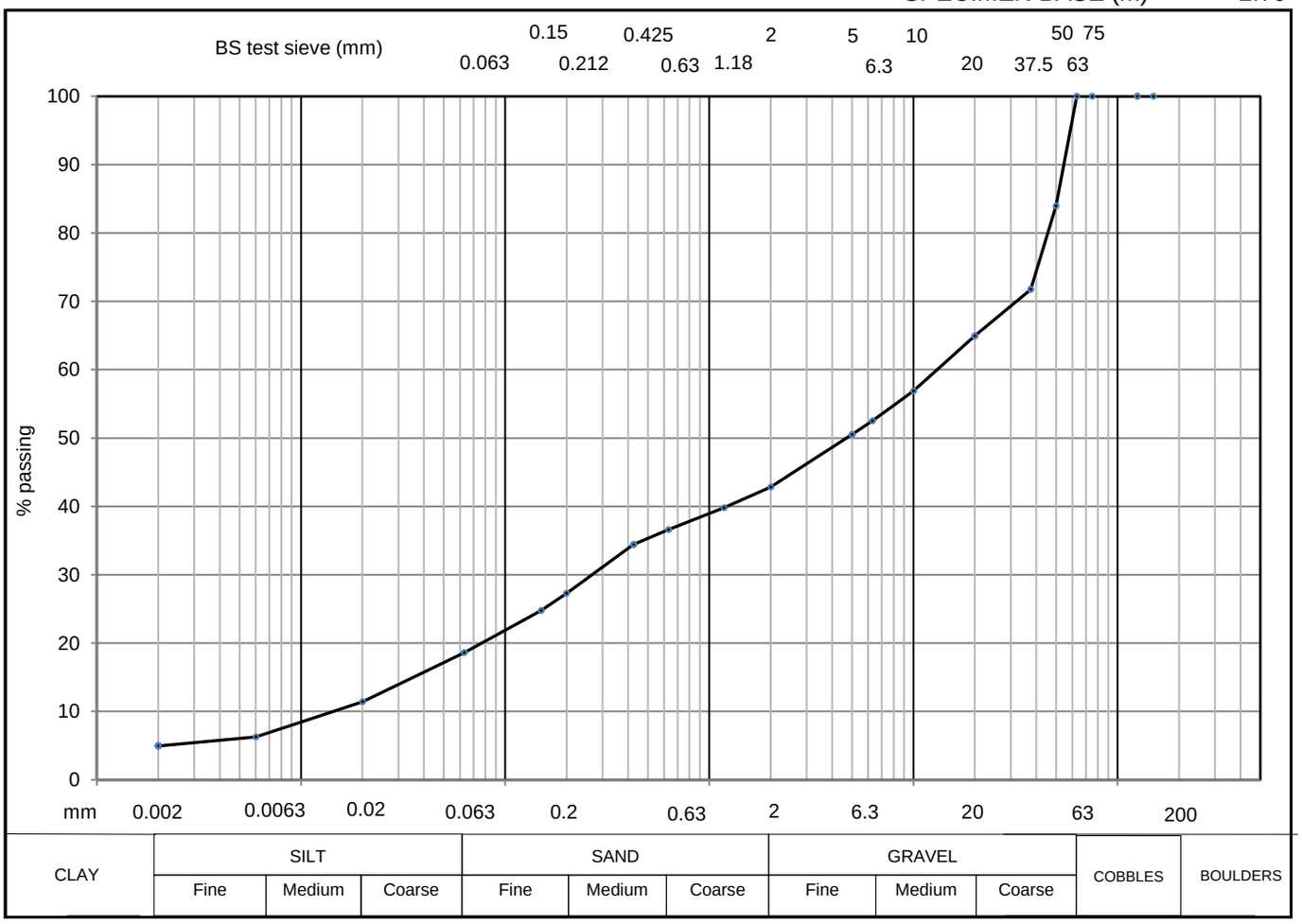
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP201
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	2.50
DESCRIPTION	Brown silty very sandy GRAVEL	SPECIMEN TOP (m)	2.50
		SPECIMEN BASE (m)	2.70



soil type	% fraction
CLAY	5
SILT	14
SILT & CLAY	19
SAND	24
GRAVEL	57
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	51	20	11
75		2	43	6	6
63	100	1.18	40	2	5
50	84	0.63	37		
37.5	72	0.425	34		
20	65	0.2	27		
10	57	0.15	25		
6.3	53	0.063	19		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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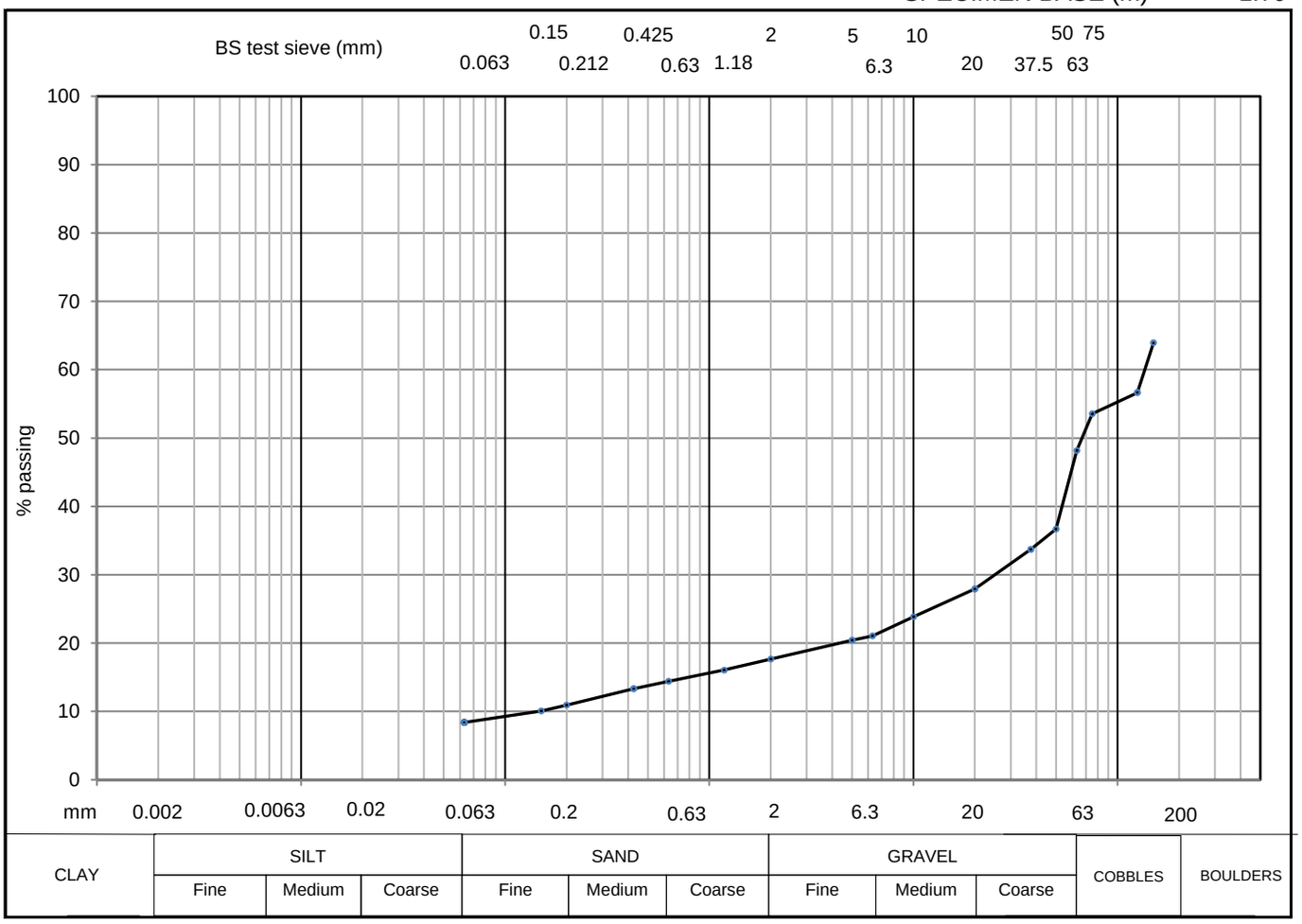
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP202
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	8
SAND	9
GRAVEL	31
COBBLE & BOULDER	52
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	64	5	20	20	
75	54	2	18	6	
63	48	1.18	16	2	
50	37	0.63	14		
37.5	34	0.425	13		
20	28	0.2	11		
10	24	0.15	10		
6.3	21	0.063	8		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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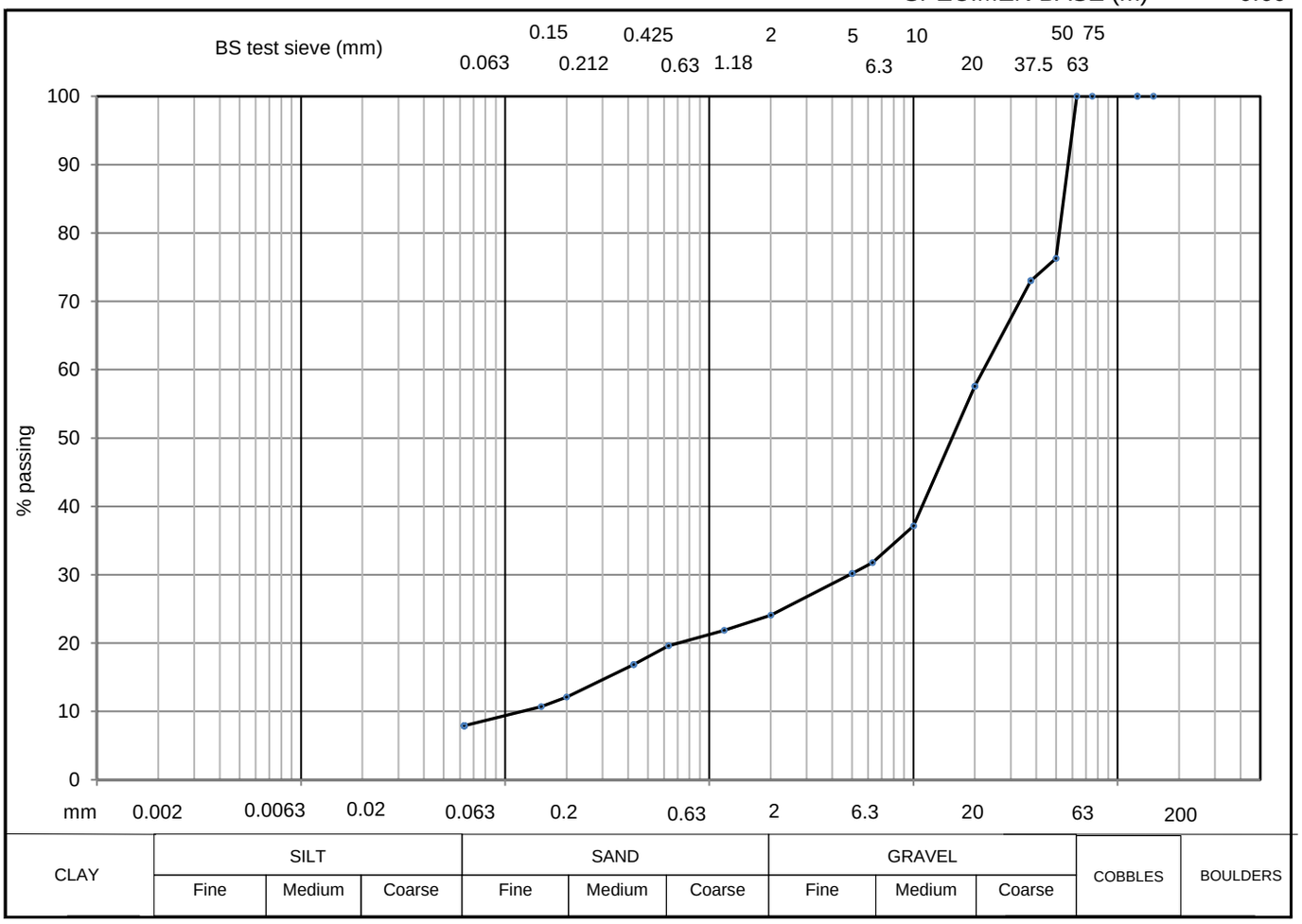
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP204
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.60



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	8
SAND	16
GRAVEL	76
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	30	20	
75		2	24	6	
63	100	1.18	22	2	
50	76	0.63	20		
37.5	73	0.425	17		
20	58	0.2	12		
10	37	0.15	11		
6.3	32	0.063	8		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

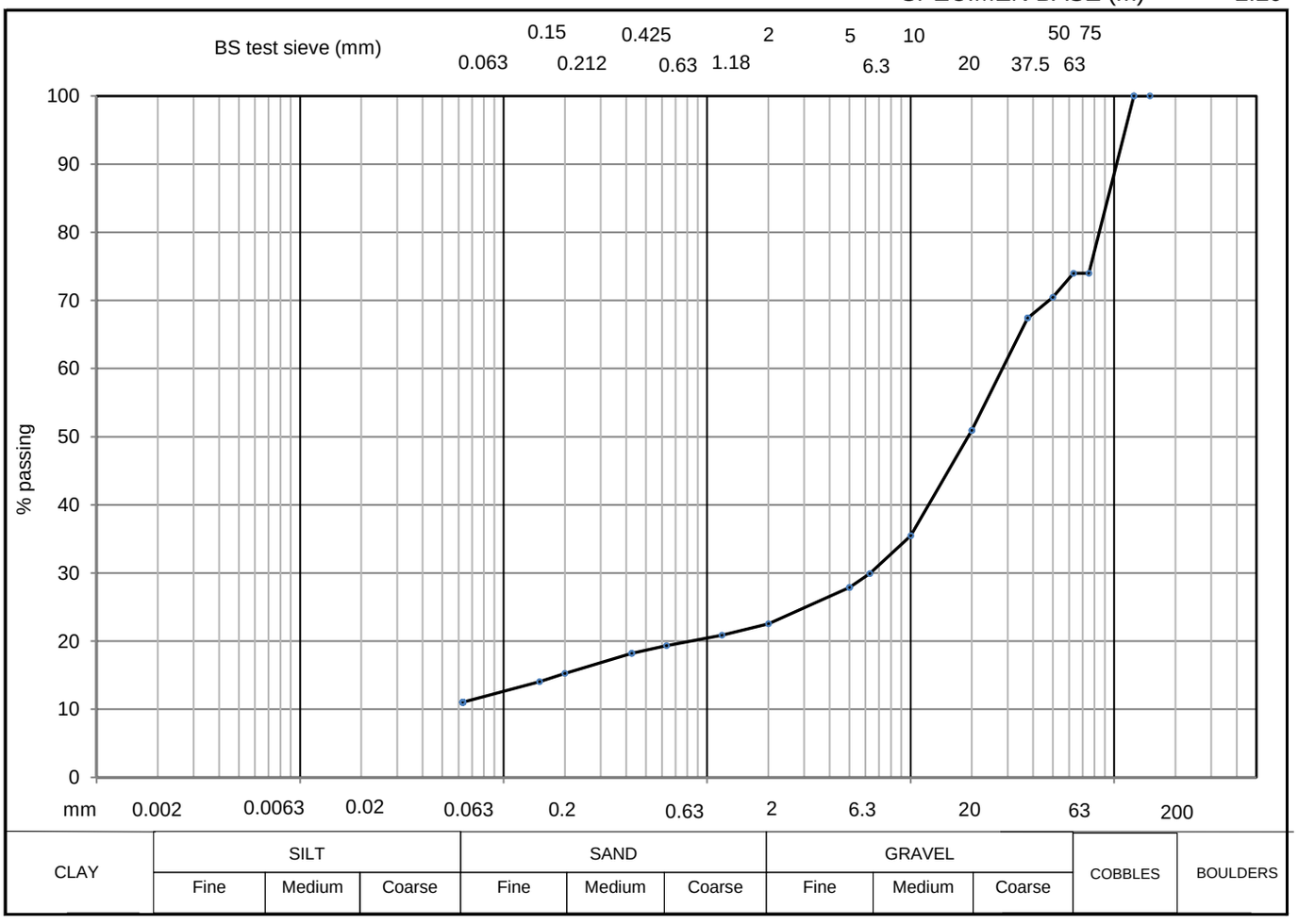
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP204
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	2.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	11
SAND	12
GRAVEL	51
COBBLE & BOULDER	26
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	28	20	
75	74	2	23	6	
63	74	1.18	21	2	
50	70	0.63	19		
37.5	67	0.425	18		
20	51	0.2	15		
10	35	0.15	14		
6.3	30	0.063	11		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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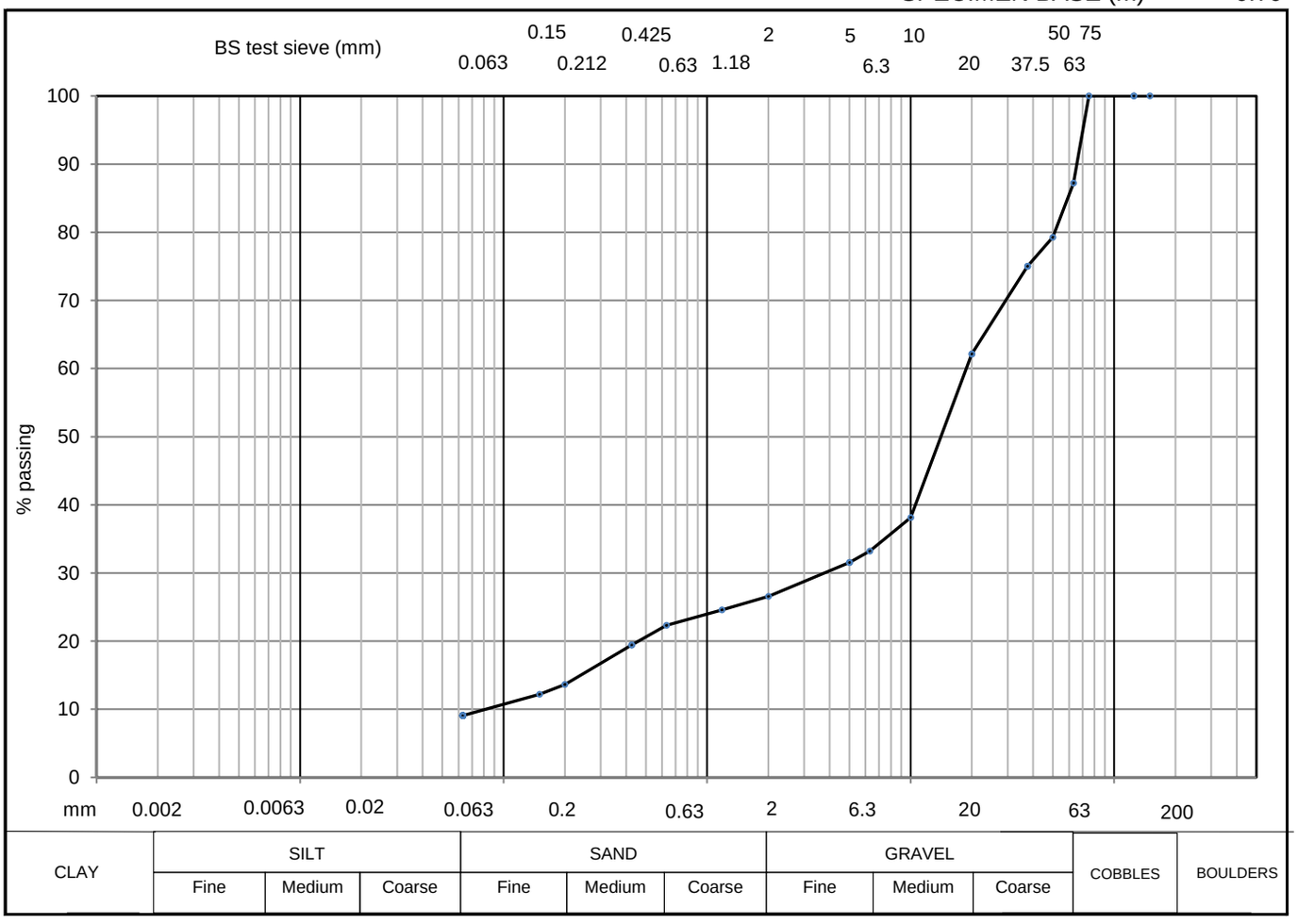
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP205
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	9
SAND	17
GRAVEL	61
COBBLE & BOULDER	13
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	32	20	
75	100	2	27	6	
63	87	1.18	25	2	
50	79	0.63	22		
37.5	75	0.425	19		
20	62	0.2	14		
10	38	0.15	12		
6.3	33	0.063	9		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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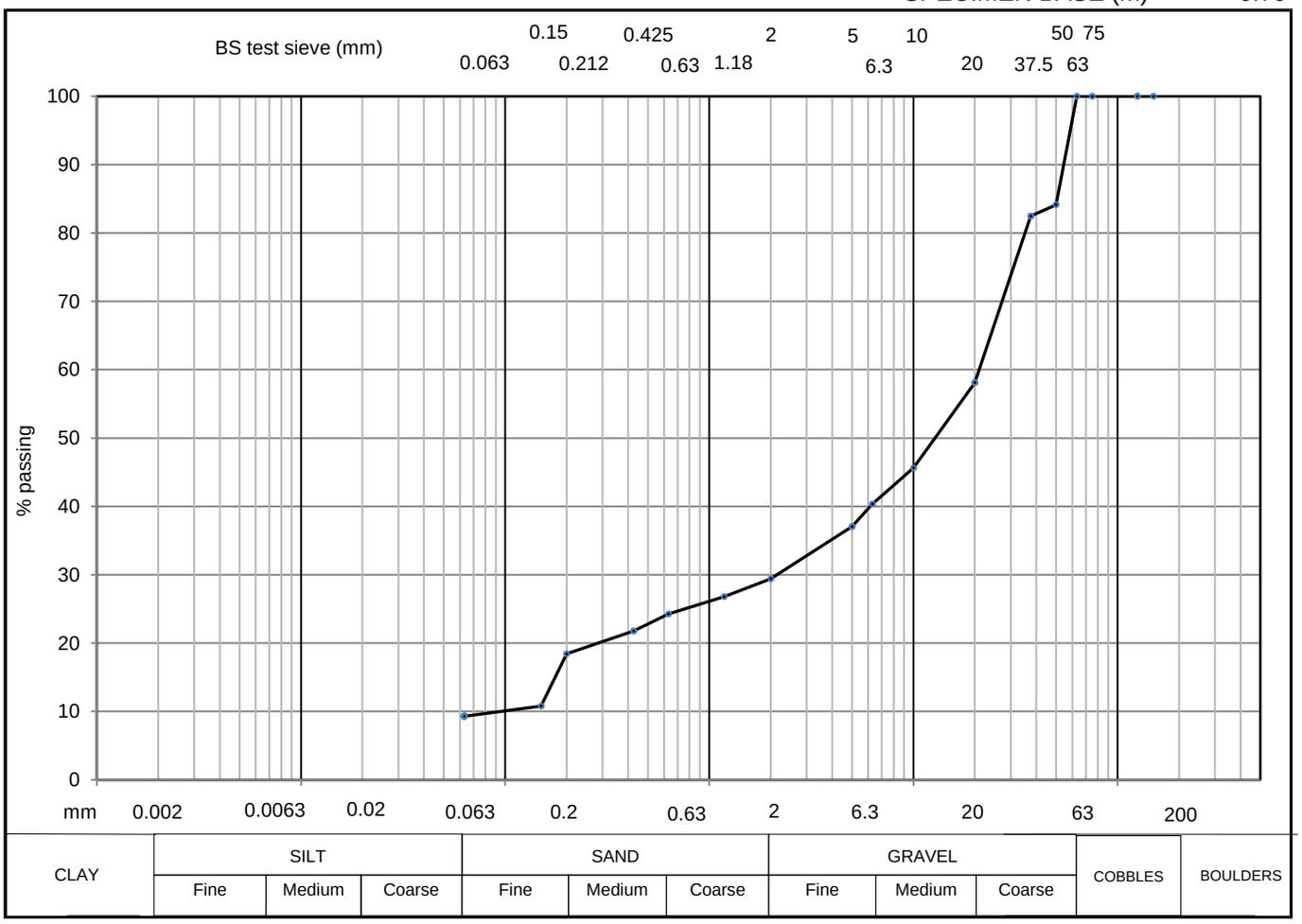
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP206A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	9
SAND	20
GRAVEL	71
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	37	20	
75		2	29	6	
63	100	1.18	27	2	
50	84	0.63	24		
37.5	82	0.425	22		
20	58	0.2	18		
10	46	0.15	11		
6.3	40	0.063	9		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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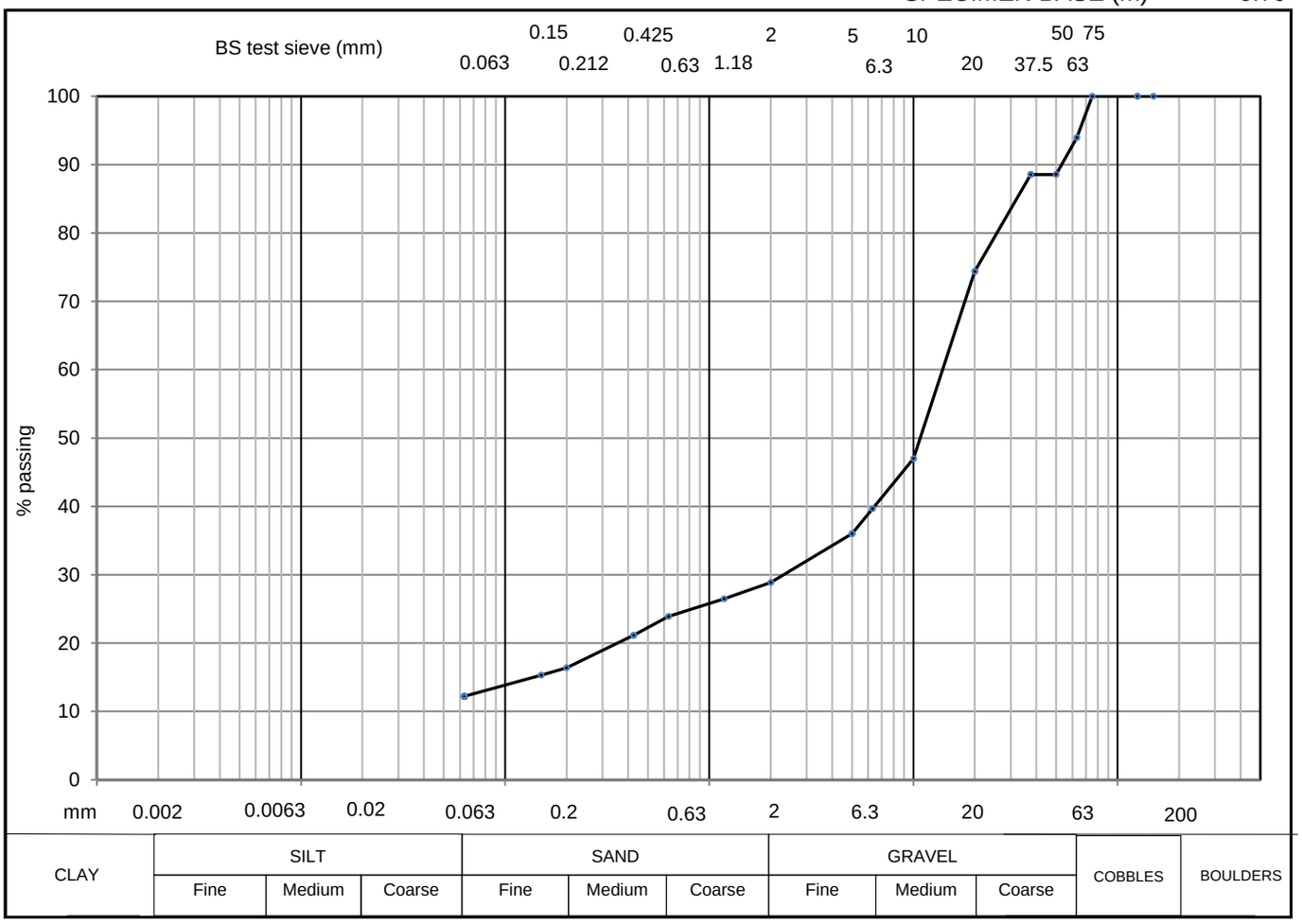
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP207A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	12
SAND	17
GRAVEL	65
COBBLE & BOULDER	6
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	36	20	
75	100	2	29	6	
63	94	1.18	26	2	
50	89	0.63	24		
37.5	89	0.425	21		
20	74	0.2	16		
10	47	0.15	15		
6.3	40	0.063	12		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

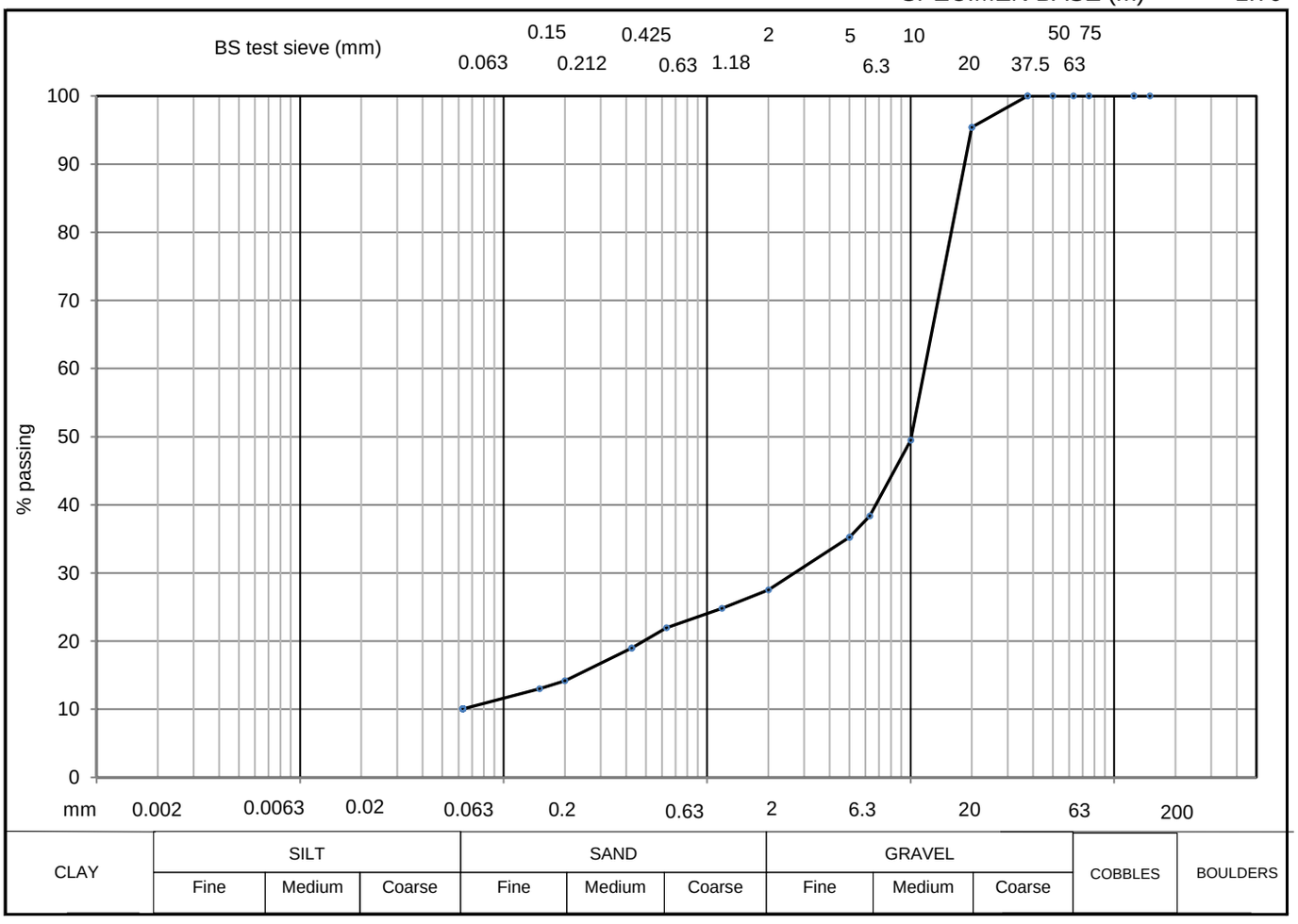
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP207A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	10
SAND	17
GRAVEL	72
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	35	20	
75		2	28	6	
63		1.18	25	2	
50		0.63	22		
37.5	100	0.425	19		
20	95	0.2	14		
10	49	0.15	13		
6.3	38	0.063	10		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

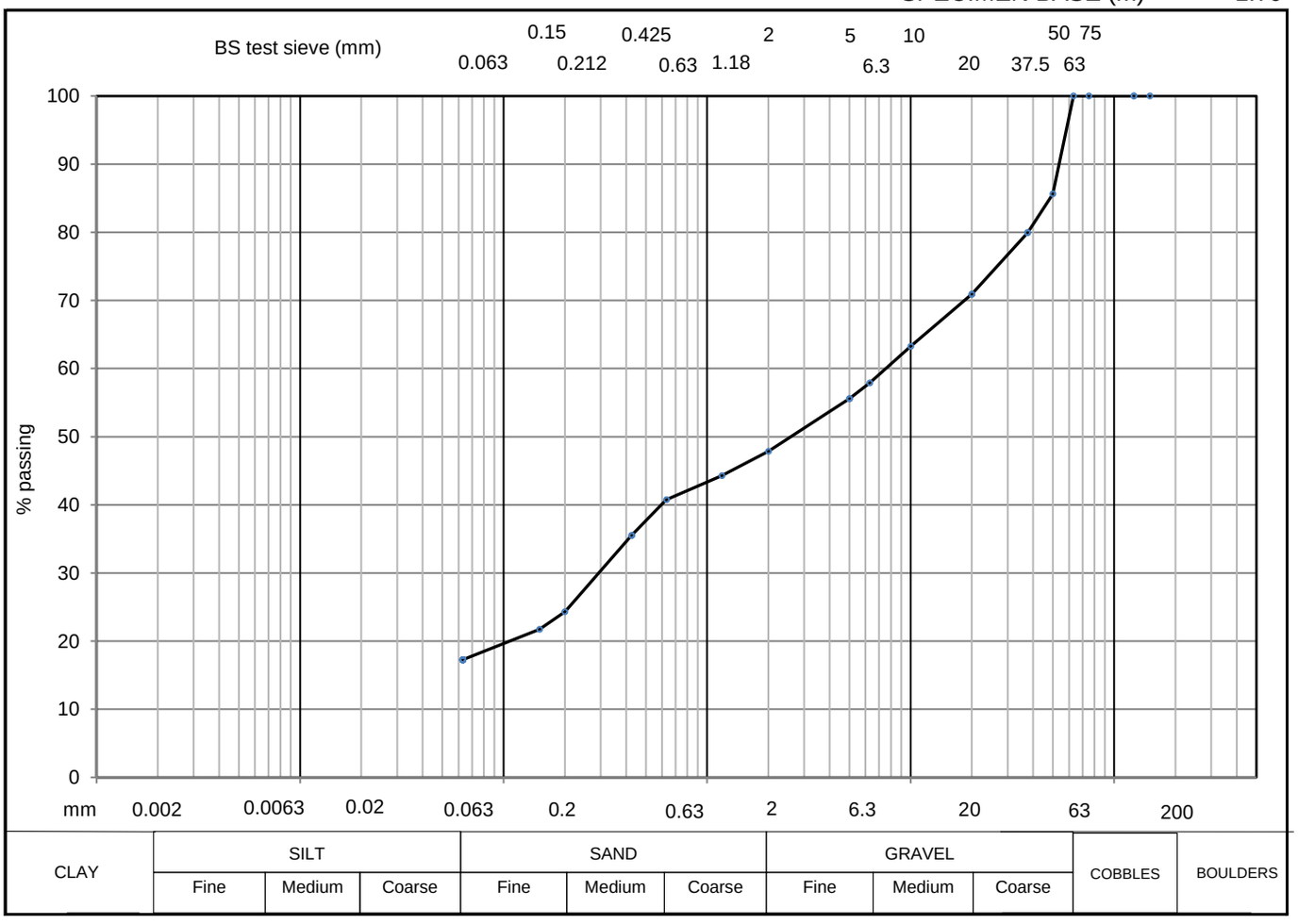
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP210
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	17
SAND	31
GRAVEL	52
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	56	20	
75		2	48	6	
63	100	1.18	44	2	
50	86	0.63	41		
37.5	80	0.425	35		
20	71	0.2	24		
10	63	0.15	22		
6.3	58	0.063	17		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

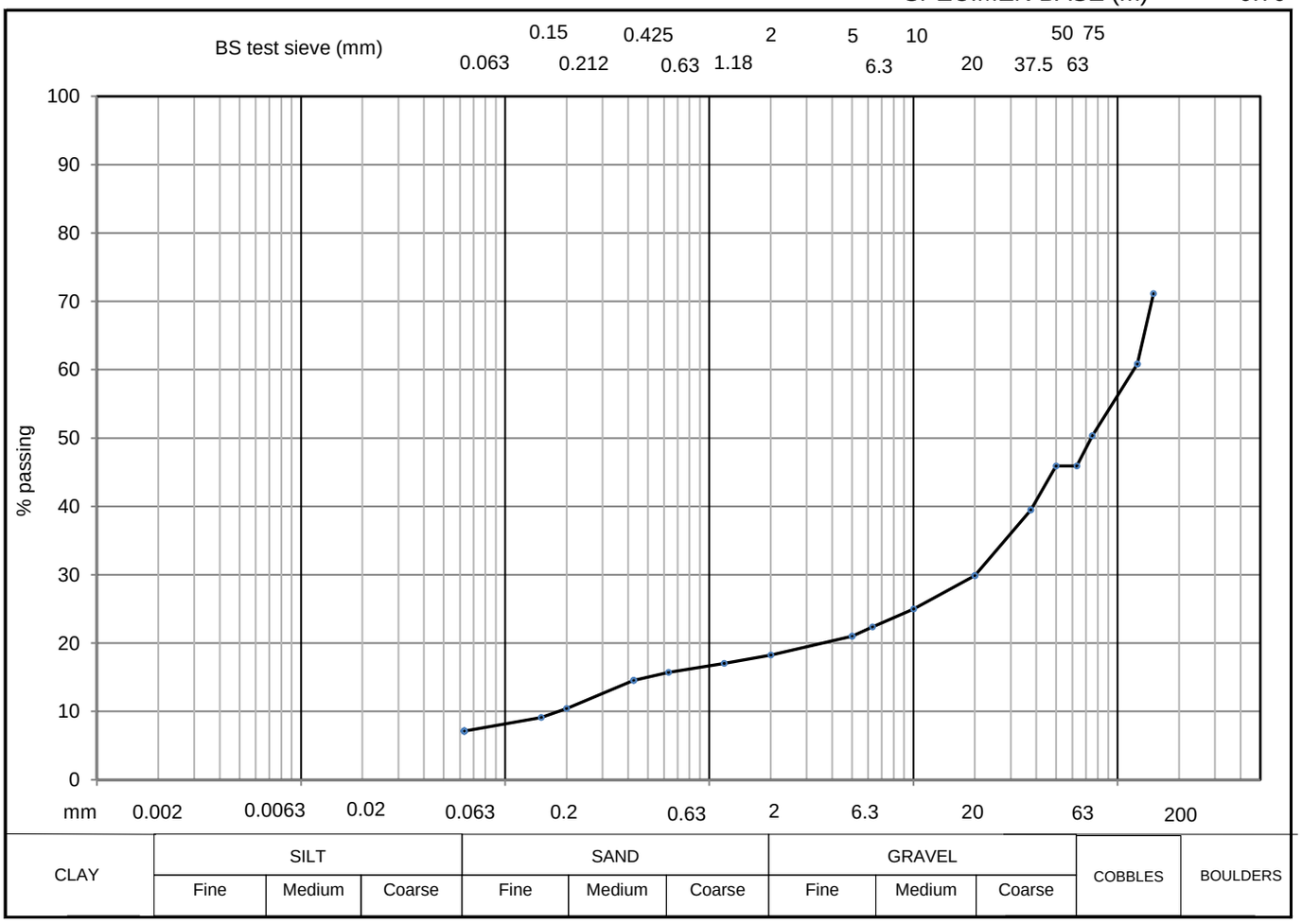
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP211
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	11
GRAVEL	28
COBBLE & BOULDER	54
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	71	5	21	20	
75	50	2	18	6	
63	46	1.18	17	2	
50	46	0.63	16		
37.5	39	0.425	15		
20	30	0.2	10		
10	25	0.15	9		
6.3	22	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

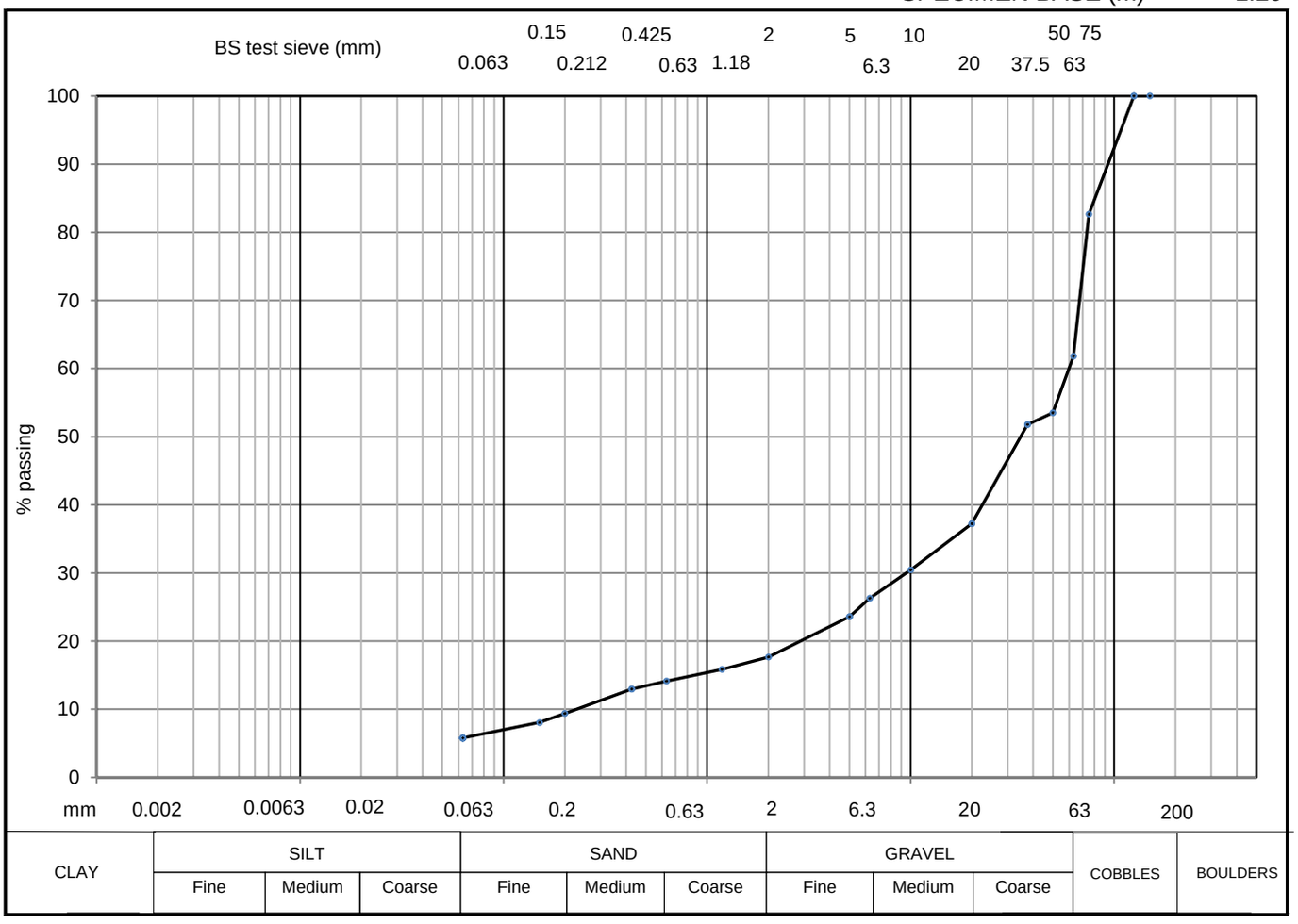
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP211
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	6
SAND	12
GRAVEL	44
COBBLE & BOULDER	38
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	24	20	
75	83	2	18	6	
63	62	1.18	16	2	
50	53	0.63	14		
37.5	52	0.425	13		
20	37	0.2	9		
10	30	0.15	8		
6.3	26	0.063	6		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

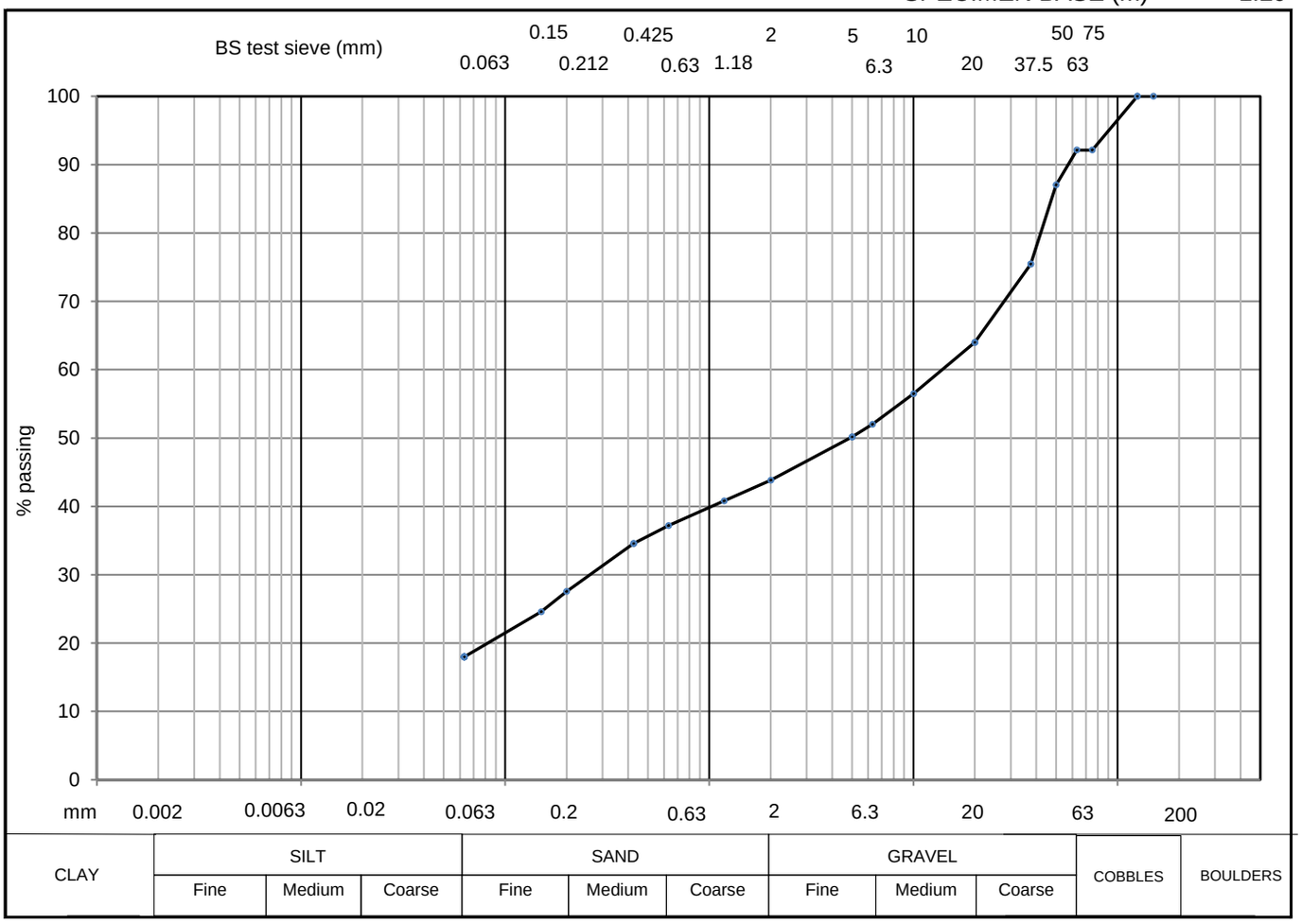
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey very sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	26
GRAVEL	48
COBBLE & BOULDER	8
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	50	20	
75	92	2	44	6	
63	92	1.18	41	2	
50	87	0.63	37		
37.5	75	0.425	35		
20	64	0.2	28		
10	56	0.15	25		
6.3	52	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

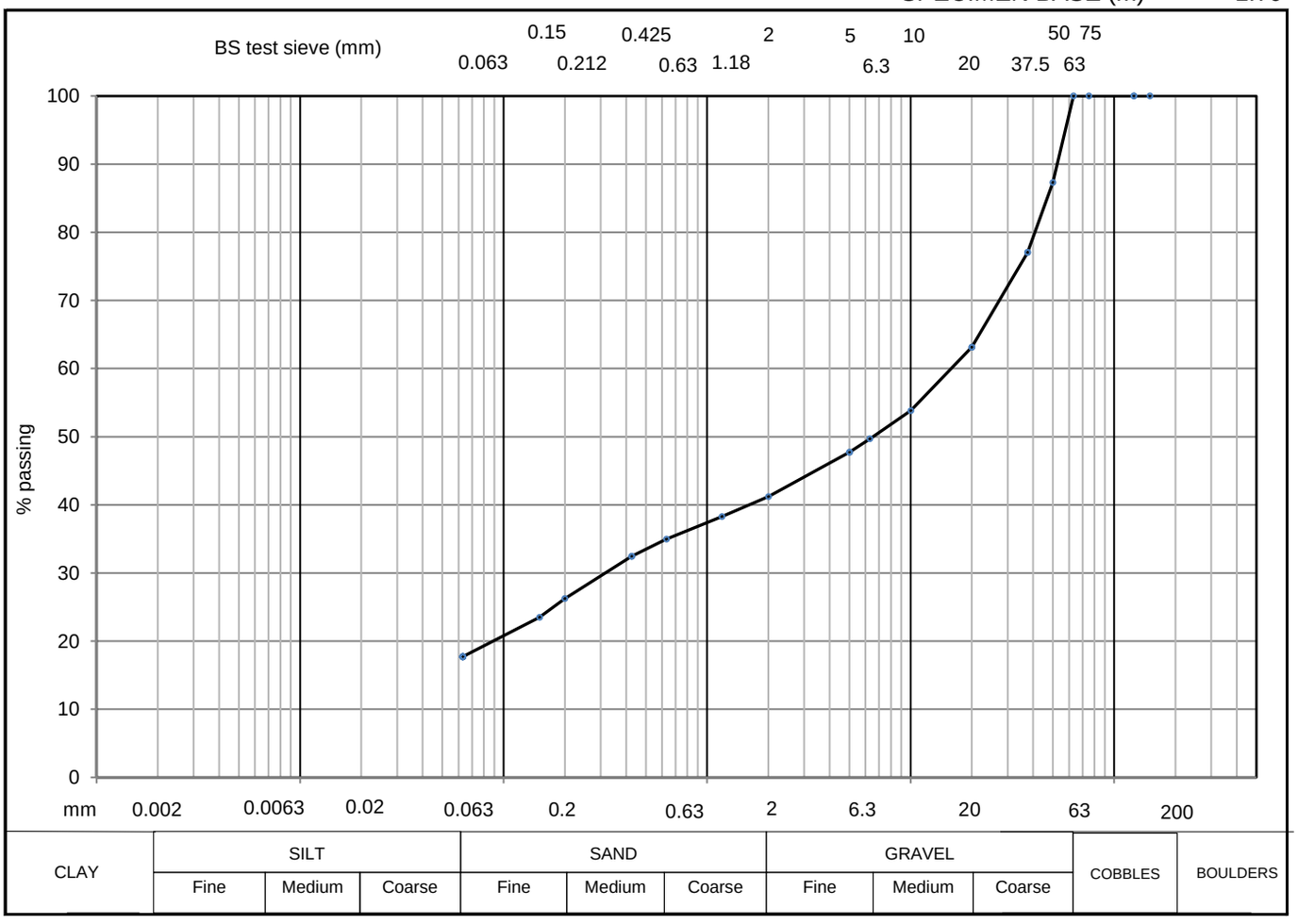
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	24
GRAVEL	59
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	48	20	
75		2	41	6	
63	100	1.18	38	2	
50	87	0.63	35		
37.5	77	0.425	32		
20	63	0.2	26		
10	54	0.15	23		
6.3	50	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

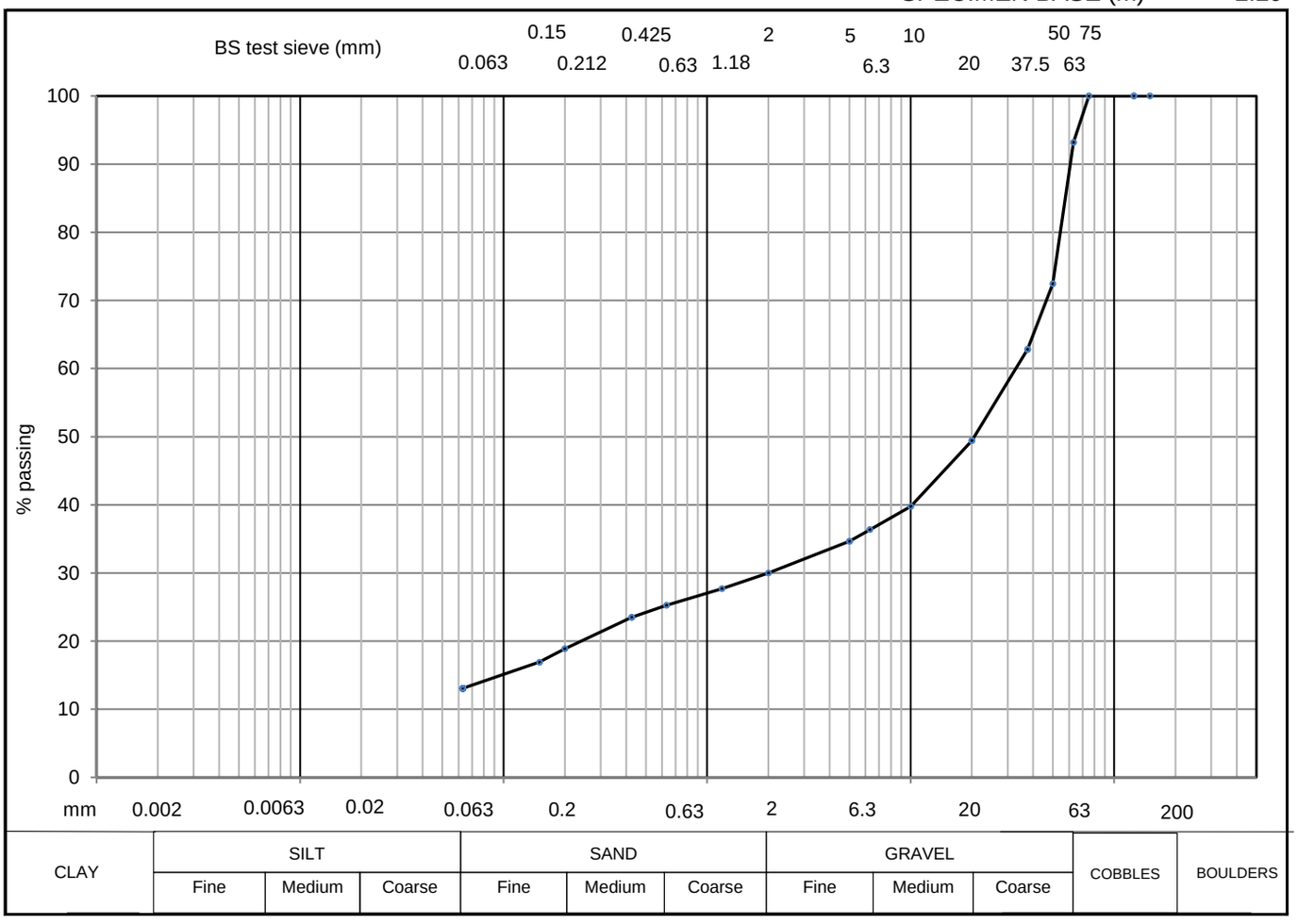
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	2.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	13
SAND	17
GRAVEL	63
COBBLE & BOULDER	7
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	35	20	
75	100	2	30	6	
63	93	1.18	28	2	
50	72	0.63	25		
37.5	63	0.425	23		
20	49	0.2	19		
10	40	0.15	17		
6.3	36	0.063	13		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

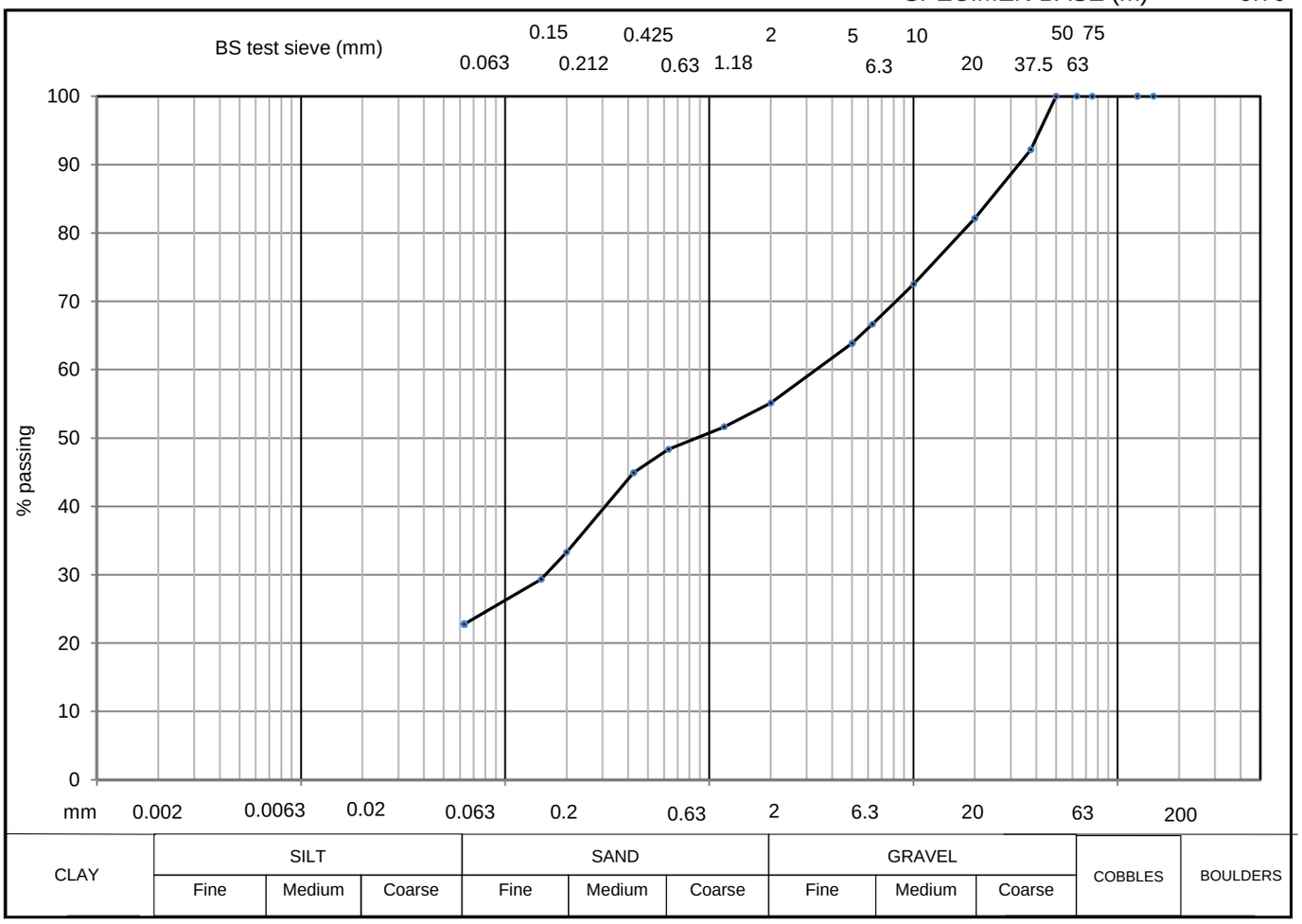
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP213
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown very clayey very sandy GRAVEL with rare rootets	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	32
GRAVEL	45
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	64	20	
75		2	55	6	
63		1.18	52	2	
50	100	0.63	48		
37.5	92	0.425	45		
20	82	0.2	33		
10	73	0.15	29		
6.3	67	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

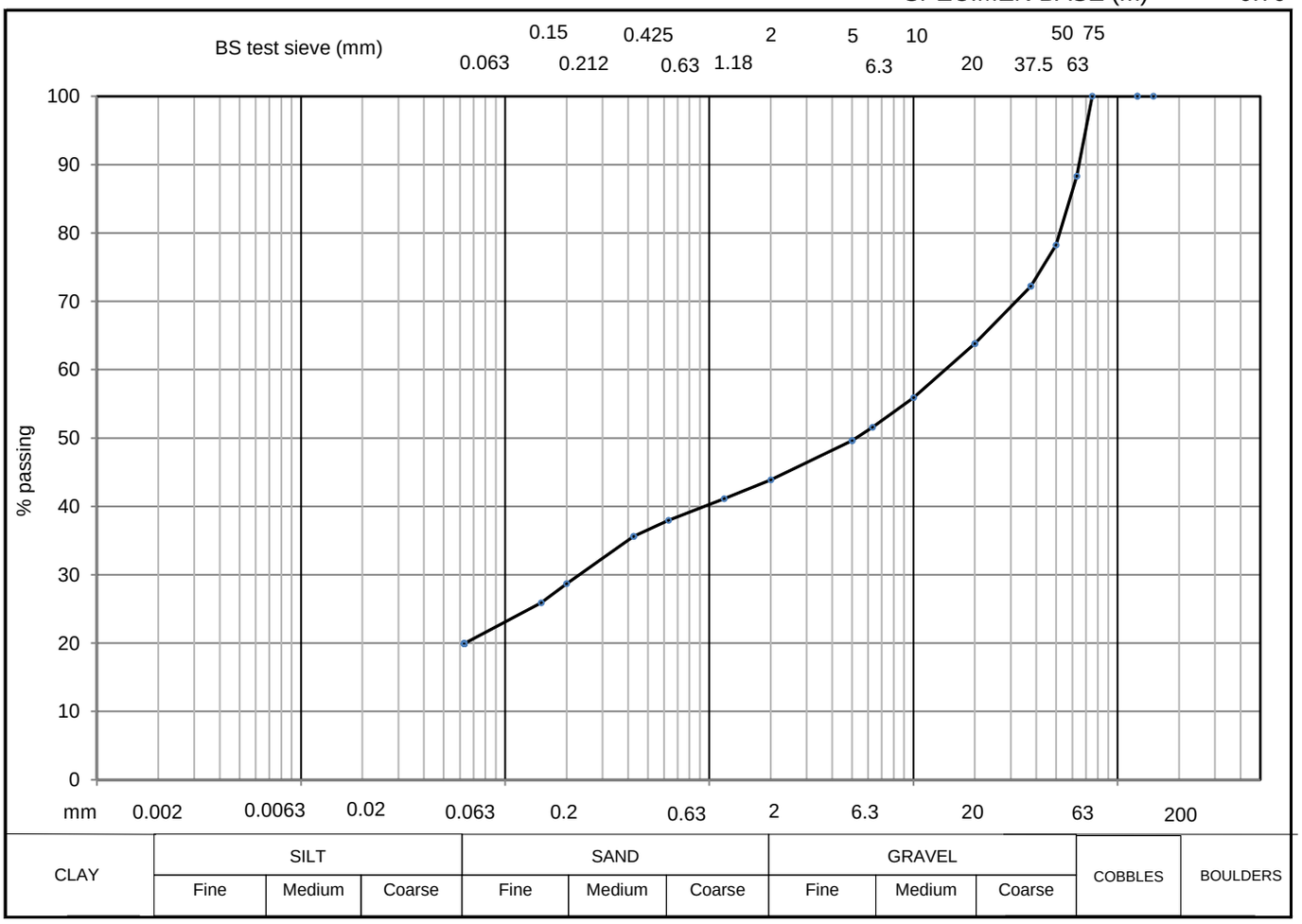
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP214
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey very sandy GRAVEL with meduim cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	20
SAND	24
GRAVEL	44
COBBLE & BOULDER	12
test method(s)	5.2

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	50	20	
75	100	2	44	6	
63	88	1.18	41	2	
50	78	0.63	38		
37.5	72	0.425	36		
20	64	0.2	29		
10	56	0.15	26		
6.3	52	0.063	20		

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

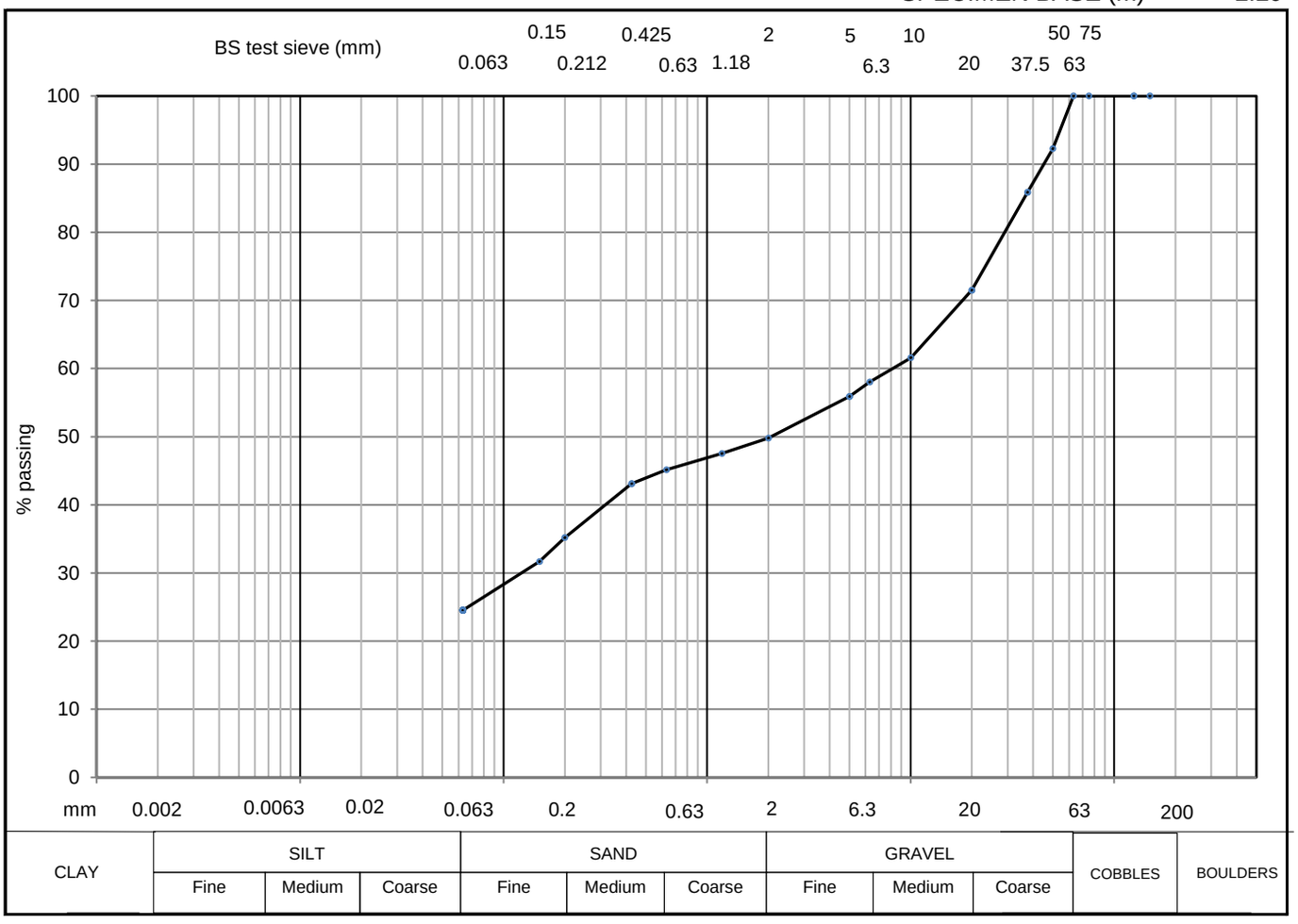
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP214
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown very clayey very sandy GRAVEL	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	2.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	25
SAND	25
GRAVEL	50
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	56	20	
75		2	50	6	
63	100	1.18	48	2	
50	92	0.63	45		
37.5	86	0.425	43		
20	72	0.2	35		
10	62	0.15	32		
6.3	58	0.063	25		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

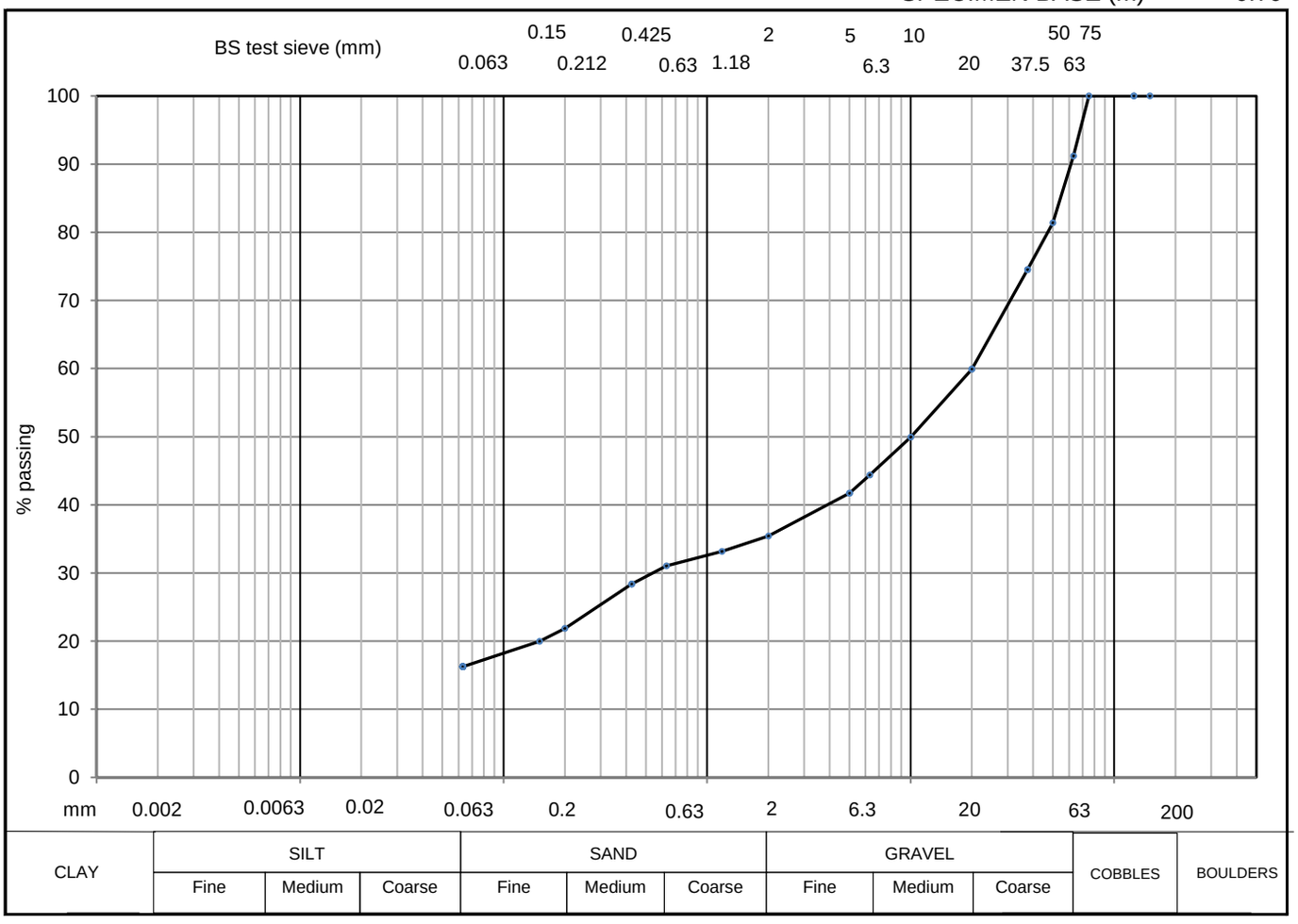
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP216
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	16
SAND	19
GRAVEL	56
COBBLE & BOULDER	9
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	42	20	
75	100	2	35	6	
63	91	1.18	33	2	
50	81	0.63	31		
37.5	75	0.425	28		
20	60	0.2	22		
10	50	0.15	20		
6.3	44	0.063	16		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

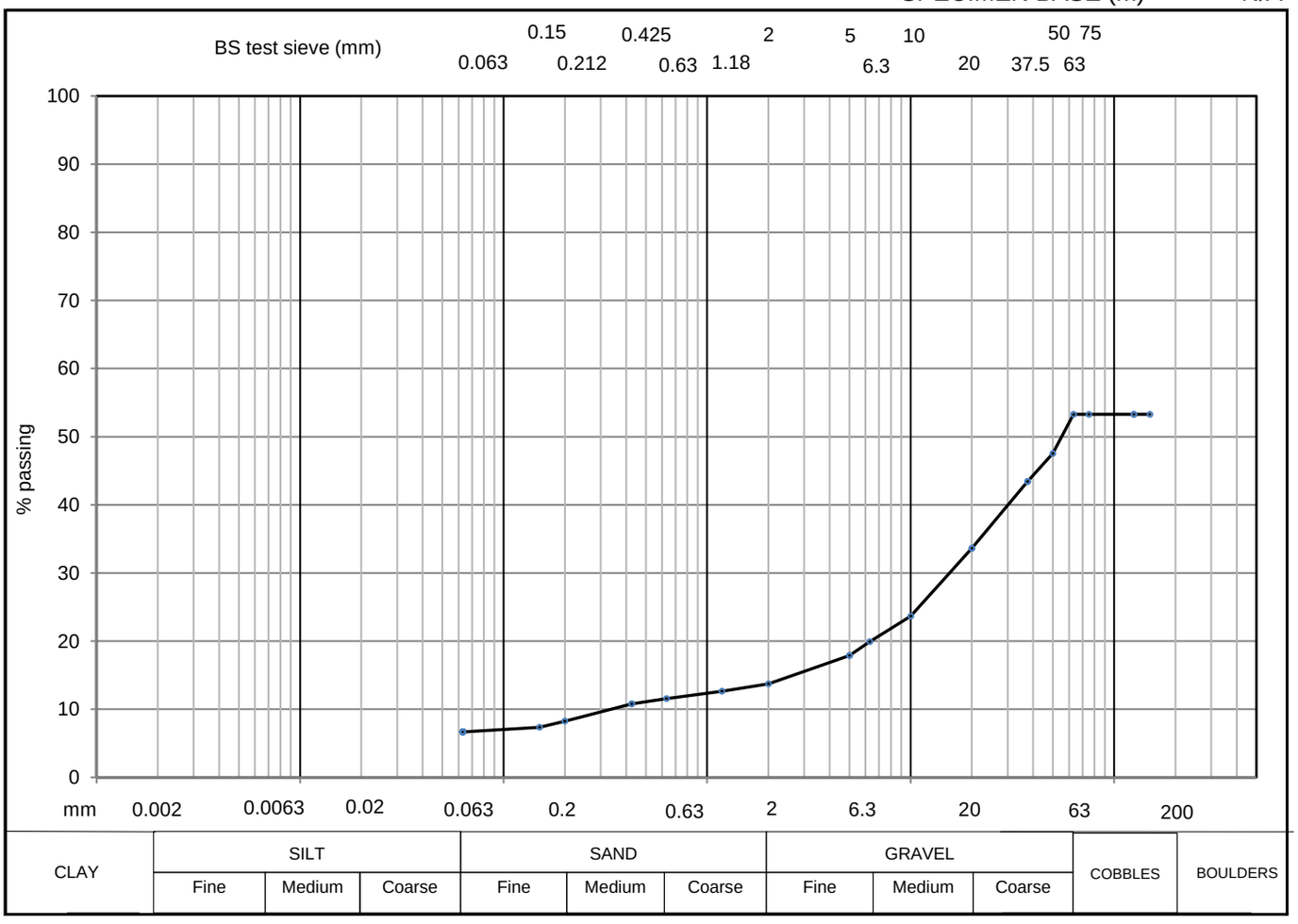
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP216
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3D
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	7
GRAVEL	40
COBBLE & BOULDER	47
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	53	5	18	20	
75	53	2	14	6	
63	53	1.18	13	2	
50	48	0.63	12		
37.5	43	0.425	11		
20	34	0.2	8		
10	24	0.15	7		
6.3	20	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

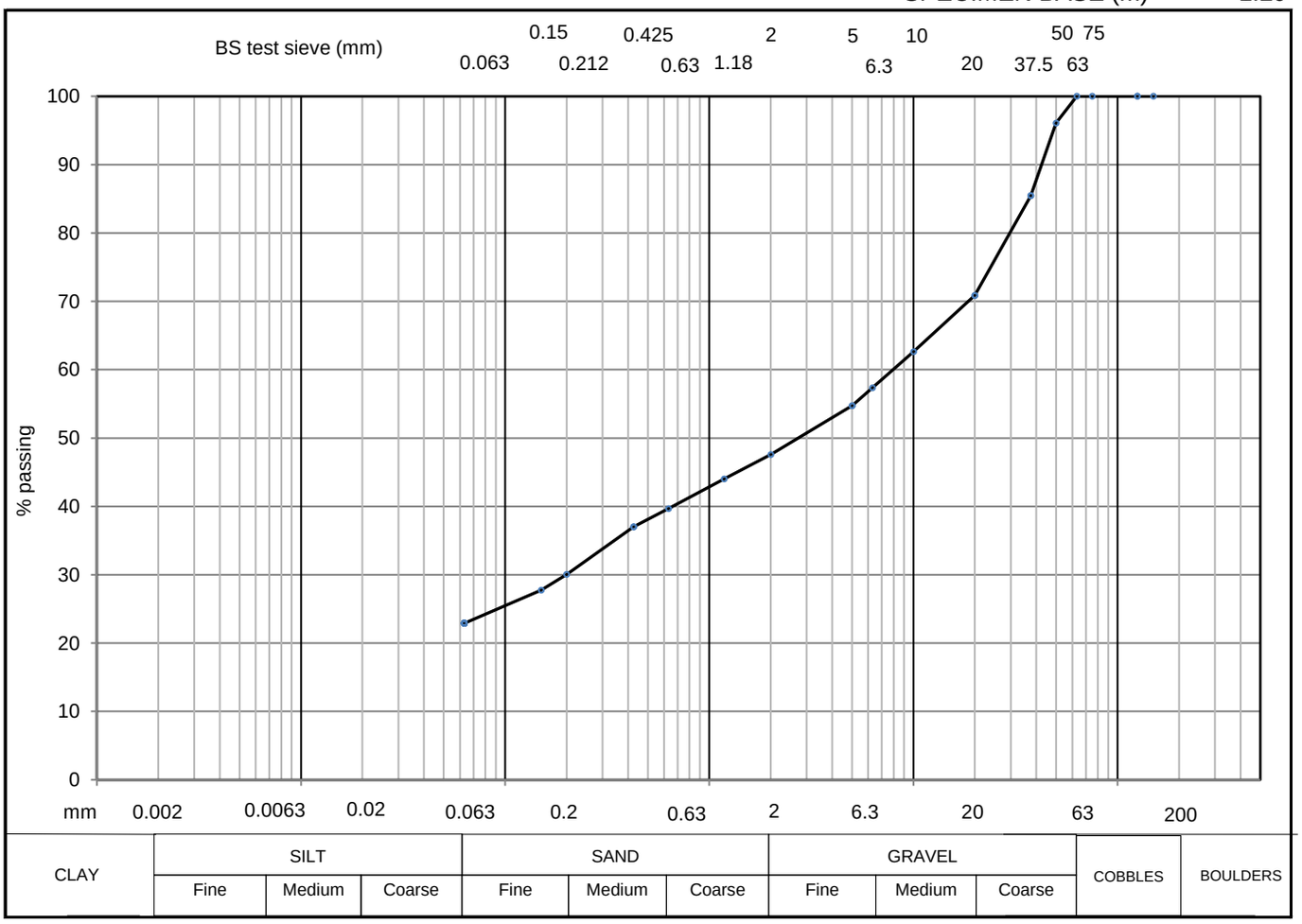
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP217
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown very clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	25
GRAVEL	52
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	55	20	
75		2	48	6	
63	100	1.18	44	2	
50	96	0.63	40		
37.5	85	0.425	37		
20	71	0.2	30		
10	63	0.15	28		
6.3	57	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

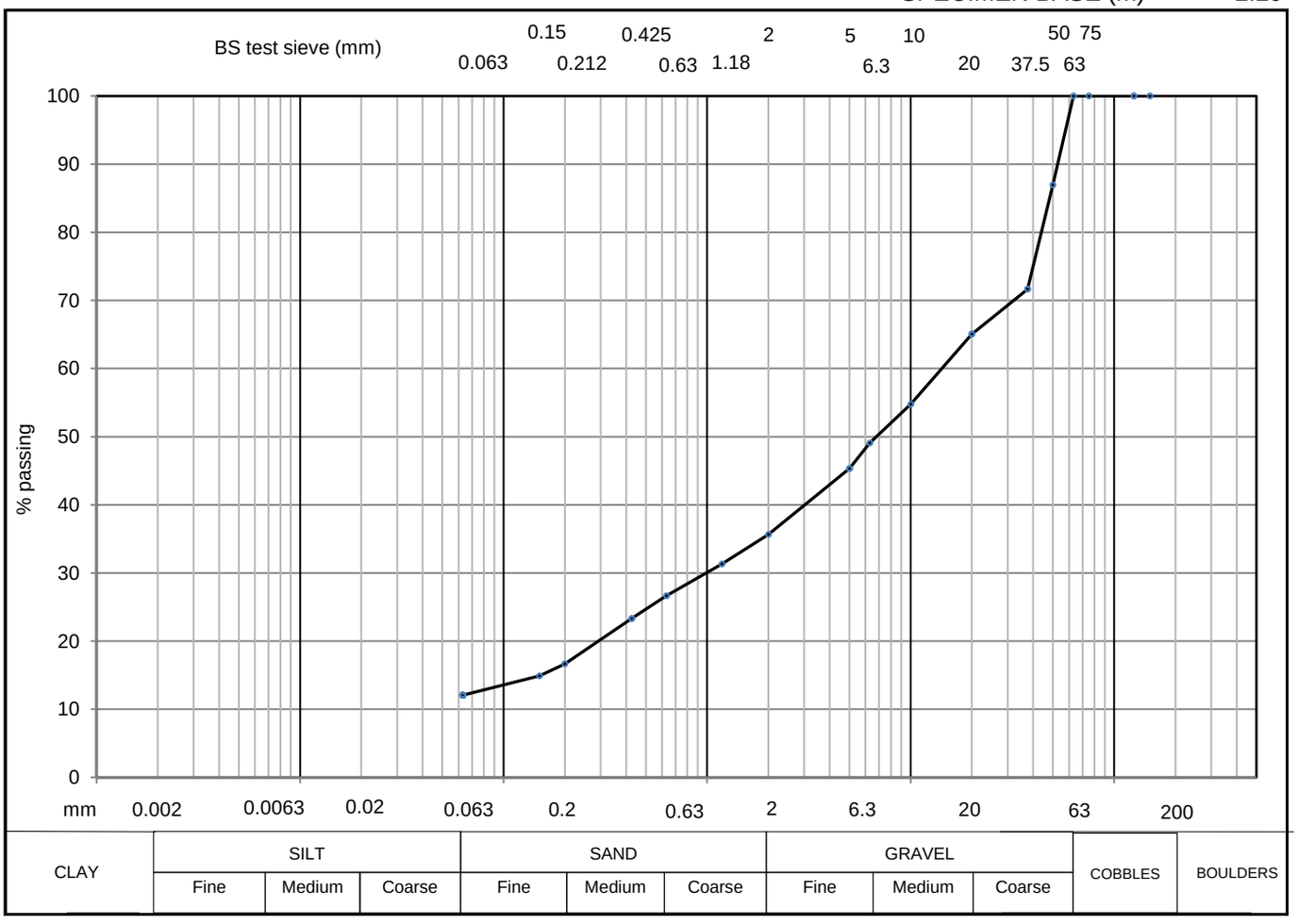
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP217
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	2.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	12
SAND	24
GRAVEL	64
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	45	20	
75		2	36	6	
63	100	1.18	31	2	
50	87	0.63	27		
37.5	72	0.425	23		
20	65	0.2	17		
10	55	0.15	15		
6.3	49	0.063	12		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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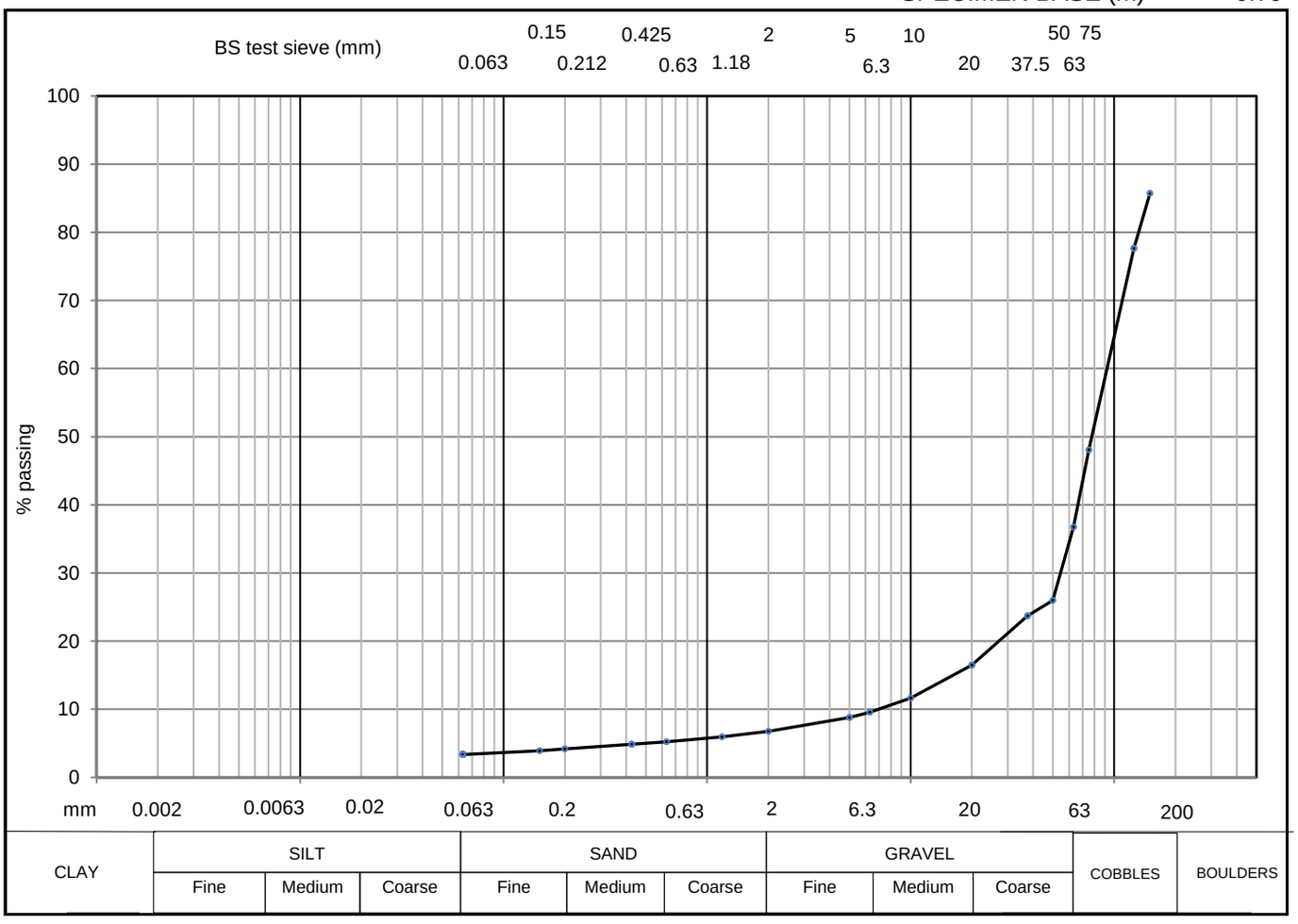
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP218
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with slightly clayey slightly sandy gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	3
GRAVEL	30
COBBLE & BOULDER	63
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	86	5	9	20	
75	48	2	7	6	
63	37	1.18	6	2	
50	26	0.63	5		
37.5	24	0.425	5		
20	16	0.2	4		
10	12	0.15	4		
6.3	10	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

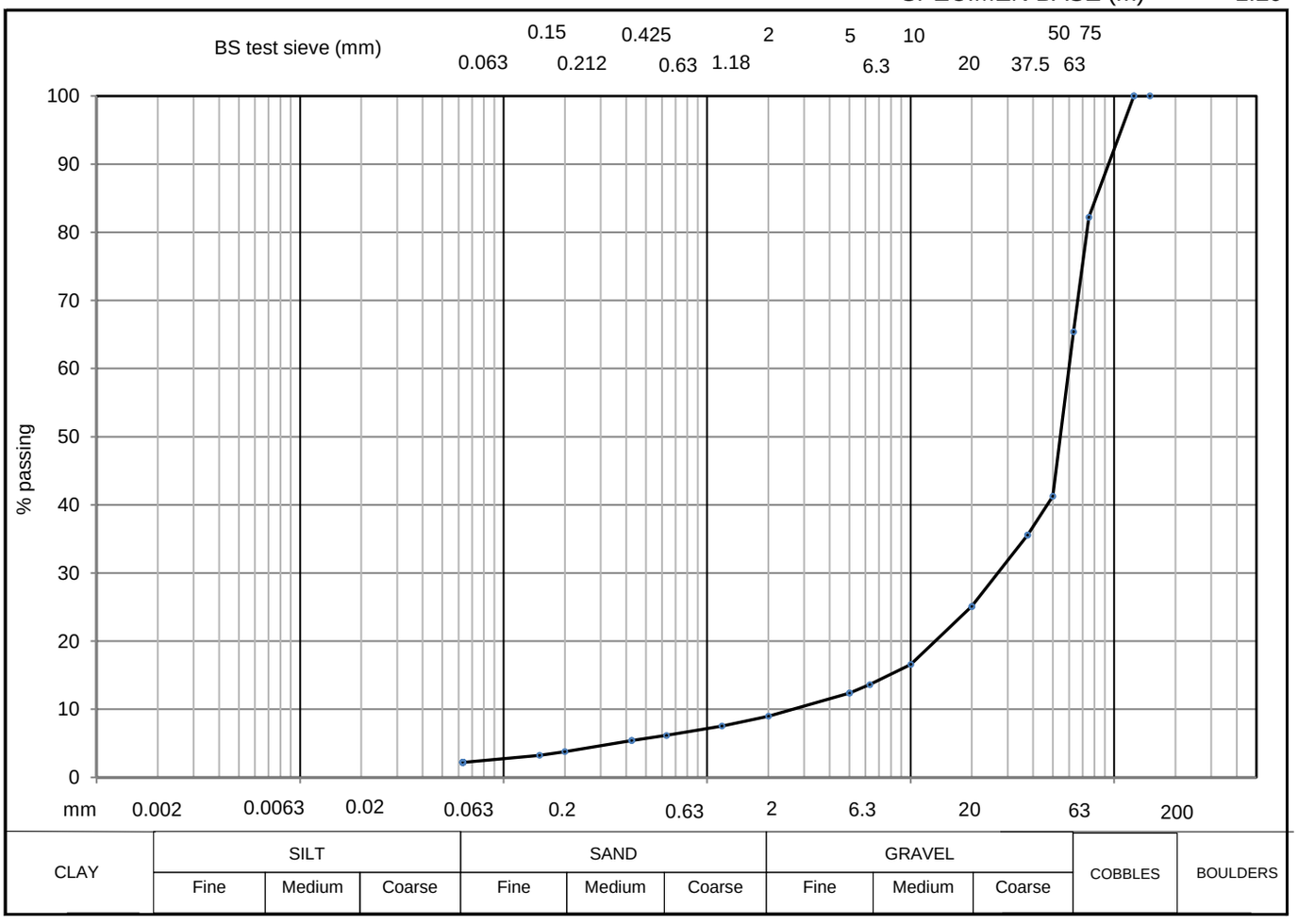
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP218
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown slightly clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	2
SAND	7
GRAVEL	56
COBBLE & BOULDER	35
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	12	20	
75	82	2	9	6	
63	65	1.18	8	2	
50	41	0.63	6		
37.5	36	0.425	5		
20	25	0.2	4		
10	17	0.15	3		
6.3	14	0.063	2		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

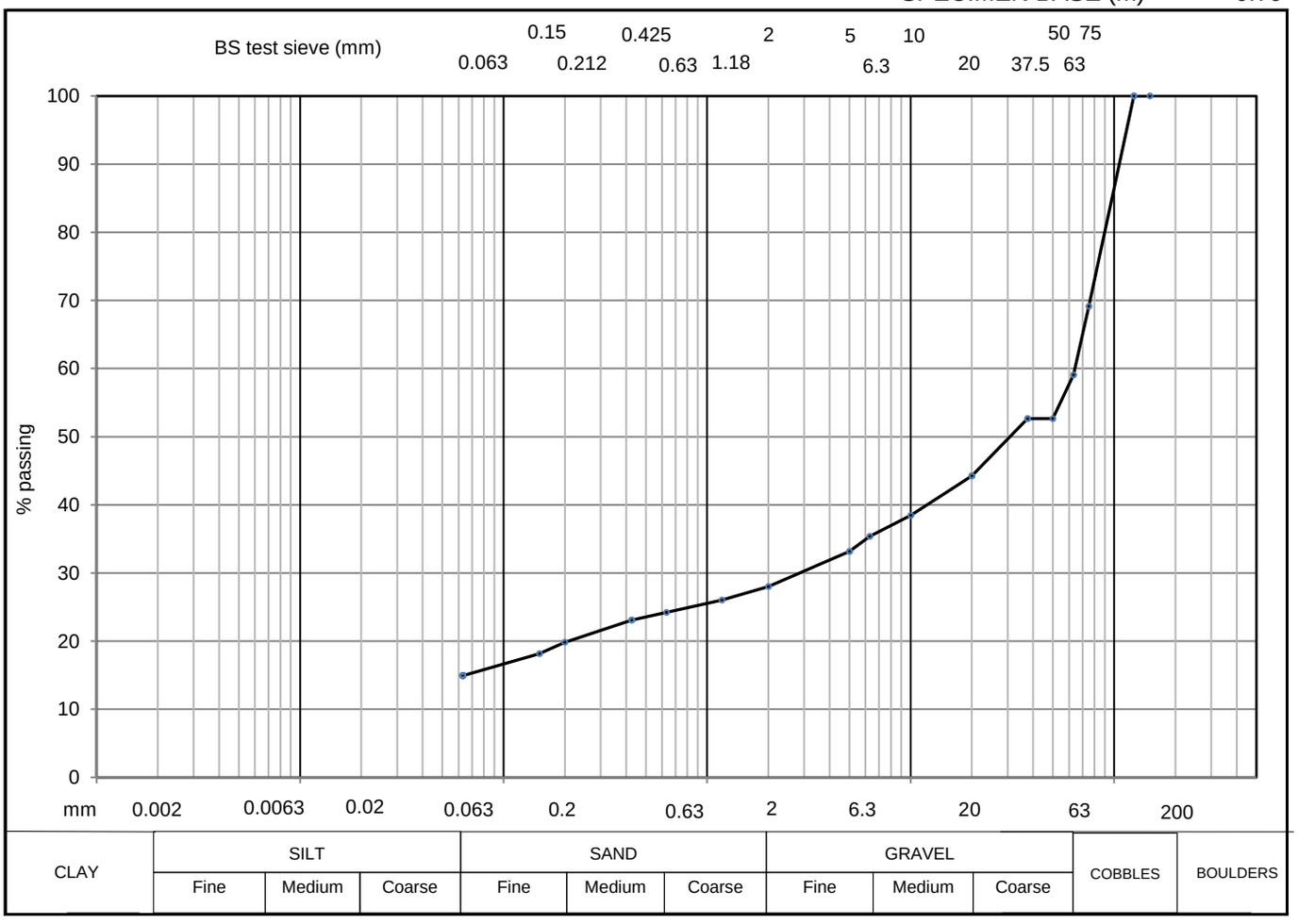
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP219
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with sandy clayey gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	15
SAND	13
GRAVEL	31
COBBLE & BOULDER	41
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	33	20	
75	69	2	28	6	
63	59	1.18	26	2	
50	53	0.63	24		
37.5	53	0.425	23		
20	44	0.2	20		
10	38	0.15	18		
6.3	35	0.063	15		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

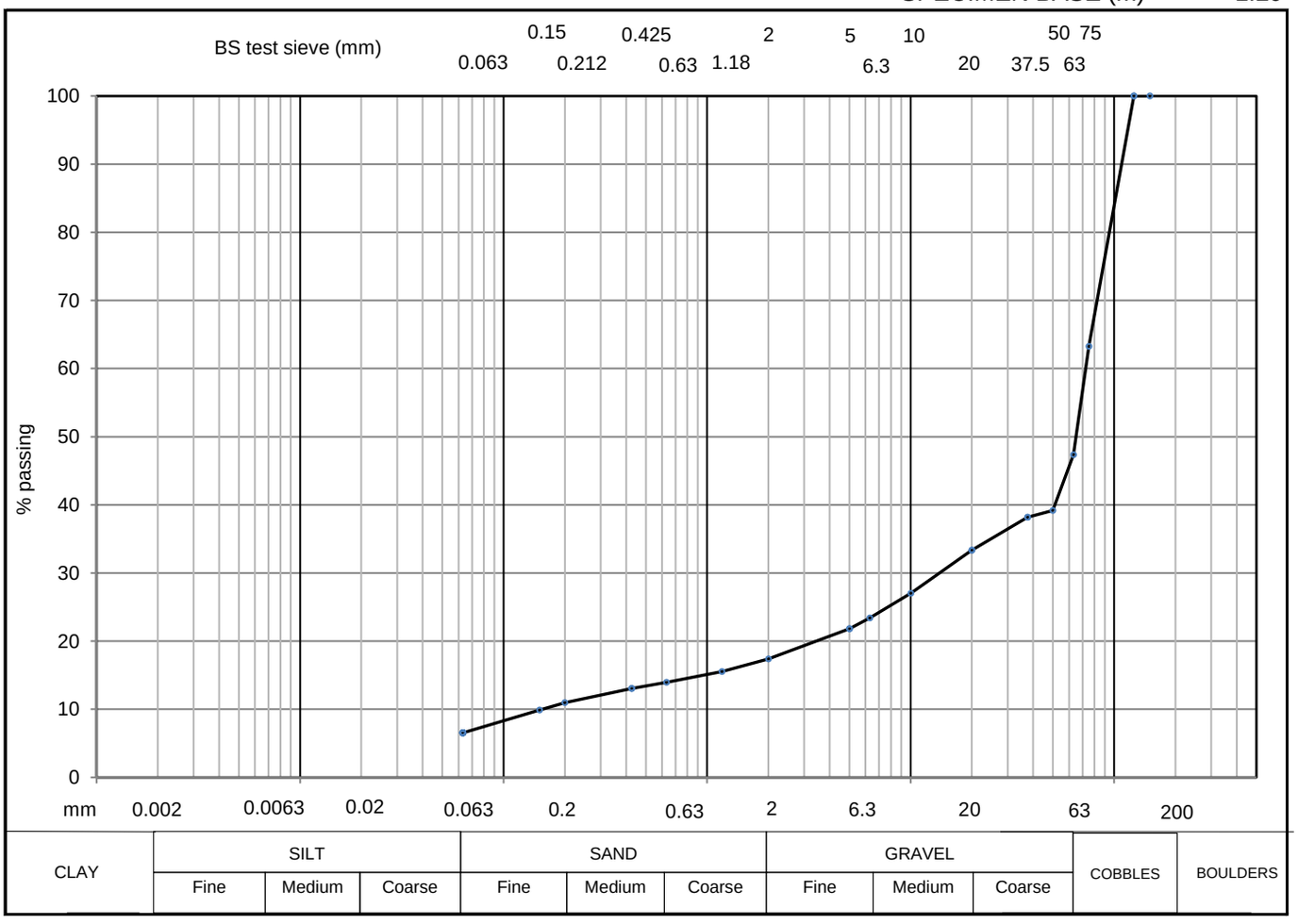
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP219
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	11
GRAVEL	30
COBBLE & BOULDER	53
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	22	20	
75	63	2	17	6	
63	47	1.18	16	2	
50	39	0.63	14		
37.5	38	0.425	13		
20	33	0.2	11		
10	27	0.15	10		
6.3	23	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

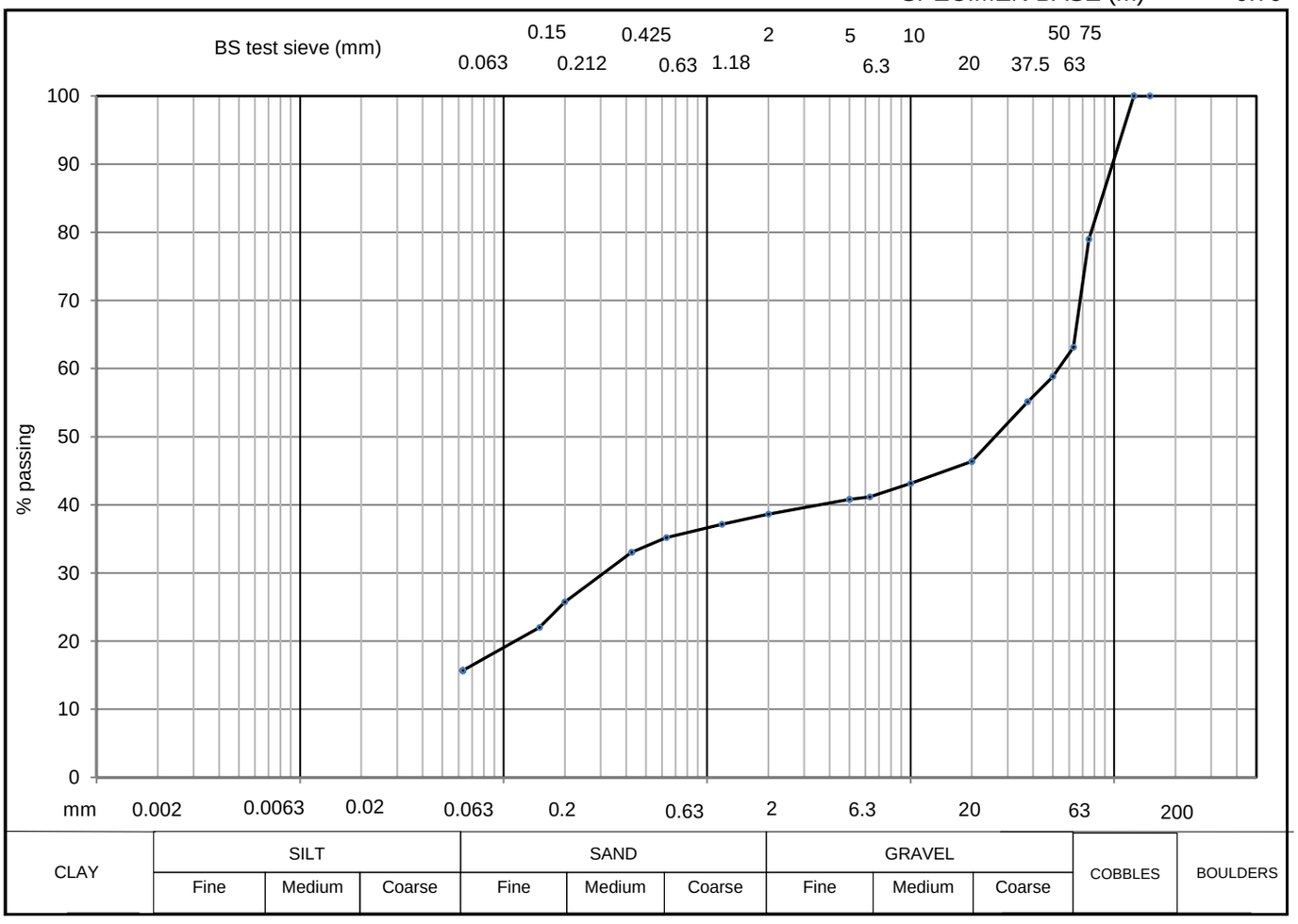
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP220
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with clayey very sandy gravel and rare rootlets	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	16
SAND	23
GRAVEL	25
COBBLE & BOULDER	37
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	41	20	
75	79	2	39	6	
63	63	1.18	37	2	
50	59	0.63	35		
37.5	55	0.425	33		
20	46	0.2	26		
10	43	0.15	22		
6.3	41	0.063	16		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
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Geotechnical Engineering Limited

ROCK WATER CONTENT

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	description and remarks
BH302B	21C	6.50	6.80	1	Brown SANDSTONE
BH304	22CS	8.45	8.45	1	Grey SANDSTONE
BH305	19C	5.00	5.20	2	Grey SANDSTONE
BH307	12C	4.00	4.60	1.1	Brown SANDSTONE

general remarks
natural water content determined unless otherwise specified

test method
samples oven dried at 105°C

CONTRACT	CHECKED
38113	**TB**

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Sample details				Density				Uniaxial Compression Test (LF0879C (1000kN) compression frame used)							
								Mean after prep.							
Borehole Ref.	Sample Ref.	Depth (m)	Description	MC (%)	Degree of Saturation (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Diameter (mm)	Height (mm)	H/D Ratio	Load at Failure (kN)	UCS (MPa) 3 sig. fig.	Failure Sketch	D. Tested	Remarks
BH303B		7.25-7.45	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	0.8	15.5	2.55	2.53	55.00	117.10	2.1	134.7	56.7		03/06/24	
BH306		5.50-5.70	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	1.5	34.3	2.61	2.57	54.40	141.60	2.6	146.0	62.8		03/06/24	
BH306		8.50-8.80	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	2.1	44.7	2.61	2.55	117.40	276.20	2.4	765.8	70.7		03/06/24	
BH307		5.80-6.10	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	0.9	12.7	2.43	2.41	117.20	236.10	2.0	775.6	71.9		03/06/24	

Note: The dimensional requirements of flatness (<0.02 mm), perpendicularity (<0.05 / 50 mm) and straightness (0.3 mm deviation) are all met. Specific Gravity used for Degree of Saturation is assumed unless specified by the client.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH303B
Sample Ref.:	-
Depth (m):	7.25-7.45

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

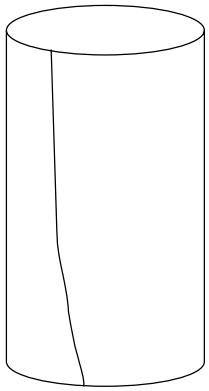
Diameter	55.00 mm
Height	117.10 mm
Bulk Density	2.55 Mg/m³
Dry Density	2.53 Mg/m³
Water Content	0.8 %

Degree of Saturation: 15.5 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/06/2024

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength Maximum load (kN): 134.70	56.7 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS

UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH306
Sample Ref.:	-
Depth (m):	5.50-5.70

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

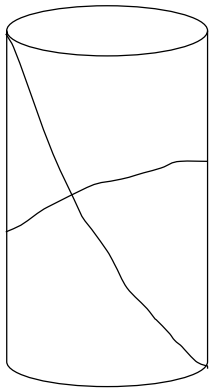
Diameter	54.40 mm
Height	141.60 mm
Bulk Density	2.61 Mg/m³
Dry Density	2.57 Mg/m³
Water Content	1.5 %

Degree of Saturation: 34.3 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Multiple fracturing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Date tested: 03/06/2024

Test results

Unconfined Compressive Strength Maximum load (kN): 146.00	62.8 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Sample type	**C**

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
38113

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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH306
Sample Ref.:	-
Depth (m):	8.50-8.80

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

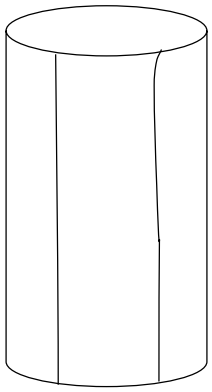
Diameter	117.40 mm
Height	276.20 mm
Bulk Density	2.61 Mg/m³
Dry Density	2.55 Mg/m³
Water Content	2.1 %

Degree of Saturation: 44.7 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Axial splitting



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Date tested: 03/06/2024

Test results

Unconfined Compressive Strength Maximum load (kN): 765.80	70.7 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
38113

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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH307
Sample Ref.:	-
Depth (m):	5.80-6.10

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

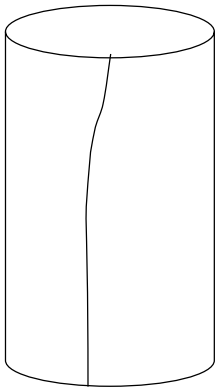
Diameter	117.20 mm
Height	236.10 mm
Bulk Density	2.43 Mg/m³
Dry Density	2.41 Mg/m³
Water Content	0.9 %

Degree of Saturation: 12.7 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/06/2024

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength Maximum load (kN): 775.60	71.9 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
38113

GEOLABS

UKAS TESTING 1982

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH301	6.05	I	U	P	110	80	70	11.15	99.01	1.14	1.36	1.55	Brown SANDSTONE
BH301	7.35	I	U	P	110	90	50	14.55	83.68	2.08	1.26	2.62	Brown SANDSTONE
BH302B	6.40	I	U	P	110	80	90	7.71	112.27	0.61	1.44	0.88	Brown SANDSTONE
BH302B	6.80	I	U	P	90	80	70	9.24	89.56	1.15	1.30	1.50	Grey SANDSTONE
BH302B	8.60	I	U	P	120	50	70	20.47	103.42	1.91	1.39	2.65	Grey SANDSTONE
BH303B	5.25	A	X	P	120		50	34.80	87.40	4.56	1.29	5.86	Grey SANDSTONE
BH303B	5.25	D	Y	P		40	120	14.36	120.00	1.00	1.48	1.48	Grey SANDSTONE
BH304	4.40	A	X	P	120		50	16.46	87.40	2.15	1.29	2.77	Grey SANDSTONE
BH304	4.40	D	Y	P		40	120	31.17	120.00	2.16	1.48	3.21	Grey SANDSTONE
BH304	6.80	I	U	P	120	60	90	26.41	117.26	1.92	1.47	2.82	Grey SANDSTONE
BH304	8.45	A	X	N	120		100	46.07	123.61	3.02	1.50	4.53	Grey SANDSTONE
BH304	8.45	D	Y	N		100	120	45.09	120.00	3.13	1.48	4.64	Grey SANDSTONE
BH305	4.40	I	U	P	120	50	90	6.48	117.26	0.47	1.47	0.69	Grey SANDSTONE
BH305	5.20	I	U	P	120	40	70	24.35	103.42	2.28	1.39	3.16	Grey SANDSTONE
BH305	7.20	I	U	P	100	50	80	5.30	100.93	0.52	1.37	0.71	Grey SANDSTONE
BH306	4.60	A	X	P	120		70	>50	103.42	>4.67	1.39	>6.48	Grey SANDSTONE
BH306	4.60	D	Y	P		40	120	23.77	120.00	1.65	1.48	2.45	Grey SANDSTONE
BH307	4.60	A	X	P	120		40	20.01	78.18	3.27	1.22	4.00	Brown SANDSTONE
BH307	4.60	D	Y	P		40	120	0.75	120.00	0.05	1.48	0.08	Brown SANDSTONE

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**38113**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH307	4.05	A	X	N	120		60	6.40	95.75	0.70	1.34	0.94	Grey SANDSTONE
BH307	4.05	D	Y	N		70	100	1.50	100.00	0.15	1.37	0.20	Grey SANDSTONE
BH307	5.60	A	X	P	120		40	22.86	78.18	3.74	1.22	4.57	Grey SANDSTONE
BH307	5.60	D	Y	P		40	120	8.73	120.00	0.61	1.48	0.90	Grey SANDSTONE

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**38113**	**TB**
I - irregular lump	Z - oblique		S - soaked		

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006 In-house Technical Procedure TP35

DETERMINATION OF POINT LOAD STRENGTH ON ROCK

Sample details				Point Load test											
Borehole Ref.	Sample Ref.	Depth (m)	Description	D. Tested	Test type & Direction		Sample width W (mm)	Platen separation (mm)		Water Content (%)	Equiv. Diameter D_e (mm)	Failure Load P (kN)	I_s P/De^2 (MPa)	Correction Factor F	Point Load Index $I_{s(50)}$ (MPa)
								Start D	End D'						
BH301		4.00-5.50	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	04/06/24	I	U	77.1	71.5	71.5		83.8	10.27	1.46	1.26	1.84

(*) Sample failed on weakness

Test type and direction: **D** - Diametral **A** - Axial **B** - Block **I** - Irregular lump **P** - Perpendicular to planes of weakness **U** - Random or unknown orientation **L** - Parallel to planes of weakness

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS®

UKAS TESTING 1982

APPENDIX D

CHEMICAL ANALYSES

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Analytical Report Number : 24-014999

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	18/04/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	19/04/2024
Your order number:		**Analysis completed by:**	24/04/2024
Report Issue Number:	1	**Report issued on:**	26/04/2024
Samples Analysed:	2 soil samples		

Signed: JSzwagrak

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

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

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

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

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

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

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

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

Analytical Report Number: 24-014999
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				175137	175138
Sample Reference				BH301	BH301
Sample Number				5	7
Depth (m)				1.80-1.90	3.50-3.60
Date Sampled				16/04/2024	16/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	65.9	98.7
Moisture Content	%	0.01	NONE	7.8	3.1
Total mass of sample received	kg	0.1	NONE	1.4	1.4
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	PDO
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	8.1	7.7
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	0.026	0.034
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	72	230
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	35.8	117
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	117
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	0.7	1.6
Total Sulphur	mg/kg	50	MCERTS	120	170
Total Sulphur	%	0.005	MCERTS	0.012	0.017
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	-	0.5
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	-	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	< 0.80

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Analytical Report Number: 24-014999
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				175137	175138
Sample Reference				BH301	BH301
Sample Number				5	7
Depth (m)				1.80-1.90	3.50-3.60
Date Sampled				16/04/2024	16/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	8.7
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	-	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8
Chromium (III)	mg/kg	1	NONE	-	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	5.2
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	2.8
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	42
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	20
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	74
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	4.7
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	9.4

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

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Analytical Report Number : 24-014999
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
175137	BH301	5	1.80-1.90	Brown loam and sand with stones
175138	BH301	7	3.50-3.60	Brown loam and sand with stones

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Analytical Report Number : 24-014999
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

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Analytical Report Number : 24-014999
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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Analytical Report Number : 24-015003

Replaces Analytical Report Number: 24-015003, issue no. 1
Additional analysis undertaken.
Added missing pH and Monohydric Phenols to the sample 175145.

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	17/04/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	19/04/2024
Your order number:		**Analysis completed by:**	24/04/2024
Report Issue Number:	2	**Report issued on:**	01/05/2024
Samples Analysed:	2 soil samples		

Signed:

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

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

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

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

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

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

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Analytical Report Number: 24-015003
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				175144	175145
Sample Reference				BH301	BH301
Sample Number				3	4
Depth (m)				0.50-0.70	1.00-1.20
Date Sampled				15/04/2024	15/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	87.7	< 0.1
Moisture Content	%	0.01	NONE	5.5	8.5
Total mass of sample received	kg	0.1	NONE	1.4	1.4
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	SSZ
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	11.4	10.8
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	0.518	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	260	710
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	132	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	356
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	18	-
Total Sulphur	mg/kg	50	MCERTS	2000	-
Total Sulphur	%	0.005	MCERTS	0.198	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	-	1.3
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	-
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	-	0.08
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	0.18
Fluorene	mg/kg	0.05	MCERTS	-	0.2
Phenanthrene	mg/kg	0.05	MCERTS	-	1.2
Anthracene	mg/kg	0.05	MCERTS	-	0.36
Fluoranthene	mg/kg	0.05	MCERTS	-	2
Pyrene	mg/kg	0.05	MCERTS	-	1.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.1
Chrysene	mg/kg	0.05	MCERTS	-	1.3
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	1.4
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	0.67
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	0.54
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.19
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	0.64
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	12.6
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.69
Boron (water soluble)	mg/kg	0.2	MCERTS	-	1

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Analytical Report Number: 24-015003
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				175144	175145
Sample Reference				BH301	BH301
Sample Number				3	4
Depth (m)				0.50-0.70	1.00-1.20
Date Sampled				15/04/2024	15/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8
Chromium (III)	mg/kg	1	NONE	-	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	72
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	10
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	21
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	78

Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	-

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

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Analytical Report Number : 24-015003
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
175144	BH301	3	0.50-0.70	Brown loam and sand with stones
175145	BH301	4	1.00-1.20	Brown loam and gravel

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

Analytical Report Number : 24-015003
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

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

Analytical Report Number : 24-015003
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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Analytical Report Number : 24-016507

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	26/04/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	26/04/2024
Your order number:		**Analysis completed by:**	02/05/2024
Report Issue Number:	1	**Report issued on:**	02/05/2024
Samples Analysed:	1 soil sample		

Signed:

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

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

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

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

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

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

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

Analytical Report Number: 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182361
Sample Reference				BH306
Sample Number				2
Depth (m)				0.50-0.70
Date Sampled				18/04/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	49.8
Moisture Content	%	0.01	NONE	12
Total mass of sample received	kg	0.1	NONE	1.2
Asbestos				
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	EWS
General Inorganics				
pH (L099)	pH Units	N/A	MCERTS	7.4
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	0.043
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	96
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	47.9
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	47.9
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.6
Total Sulphur	mg/kg	50	MCERTS	250
Total Sulphur	%	0.005	MCERTS	0.025
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	2.4
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0
Total Phenols				
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0
Speciated PAHs				
Naphthalene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05
Total PAH				
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80

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Analytical Report Number: 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182361
Sample Reference				BH306
Sample Number				2
Depth (m)				0.50-0.70
Date Sampled				18/04/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.9
Magnesium (water soluble)	mg/kg	5	NONE	12

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

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Analytical Report Number : 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
182361	BH306	2	0.50-0.70	Brown loam and clay with gravel and stones

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Analytical Report Number : 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

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Analytical Report Number : 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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Analytical Report Number : 24-016507
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH306	2	S	182361	c	Total cyanide in soil	L080	c

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Analytical Report Number : 24-016568

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	25/04/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	26/04/2024
Your order number:		**Analysis completed by:**	02/05/2024
Report Issue Number:	1	**Report issued on:**	07/05/2024
Samples Analysed:	5 soil samples - 2 leachate samples		

Signed:

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

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

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

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

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

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Application of uncertainty of measurement would provide a range within which the true result lies.
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Analytical Report Number: 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182666	182667	182669	182670	182672
Sample Reference				BH302B	TP202	TP204	TP204	TP210
Sample Number				3	1	1	4	5
Depth (m)				1.00-1.20	0.50	0.50	2.00	2.50
Date Sampled				23/04/2024	22/04/2024	23/04/2024	23/04/2024	23/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	71.4	56.2	51.8	40.2	55.5
Moisture Content	%	0.01	NONE	14	7.8	17	15	11
Total mass of sample received	kg	0.1	NONE	1.2	1.2	1.2	1.3	1.2
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SPU	SPU	SPU	SPU	SPU
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	11.2	8.5	11.3	8.9	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.019	-	0.184	0.033
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	330	68	340	1000	110
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	34.1	-	521	54.3
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	167	34.1	171	521	54.3
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	33	-	7.2	1
Total Sulphur	mg/kg	50	MCERTS	-	220	-	810	180
Total Sulphur	%	0.005	MCERTS	-	0.022	-	0.081	0.018
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	< 0.5	-	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.05	-	< 0.05	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	3.5	1.3	5.5	2.8	1.6
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	< 2.0	-	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	< 2.0	-	< 2.0	< 2.0
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.1	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.12	0.07	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.12	0.06	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.64	< 0.05	0.94	0.38	0.2
Anthracene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.2	0.06	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	1.6	0.22	1.4	0.63	0.6
Pyrene	mg/kg	0.05	MCERTS	1.3	0.13	0.99	0.52	0.53
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.2	0.1	0.91	0.46	0.43
Chrysene	mg/kg	0.05	MCERTS	1.4	0.13	1.1	0.59	0.57
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.8	0.14	1.5	0.75	0.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.63	0.07	0.53	0.28	0.32
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	< 0.05	0.99	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.69	< 0.05	0.61	0.33	0.37
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.21	0.11	0.12
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.73	0.07	0.61	0.34	0.34
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	11.8	0.85	10.2	4.57	4.29

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

Analytical Report Number: 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182666	182667	182669	182670	182672
Sample Reference				BH302B	TP202	TP204	TP204	TP210
Sample Number				3	1	1	4	5
Depth (m)				1.00-1.20	0.50	0.50	2.00	2.50
Date Sampled				23/04/2024	22/04/2024	23/04/2024	23/04/2024	23/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	11	33	23	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.41	0.57	0.68	0.6
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.2	1.8	1.1	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	38	14	37	30	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	14	37	30	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	45	8.6	50	30	9.7
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	12	69	28	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	8.6	19	23	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	2.3	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	21	11	34	28	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	280	47	200	170	53
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	9.6	-	< 2.5	4
Magnesium (water soluble)	mg/kg	5	NONE	-	19	-	< 5.0	8

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

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

Analytical Report Number: 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182668	182671
Sample Reference				TP202	TP210
Sample Number				3	3
Depth (m)				1.50	1.50
Date Sampled				22/04/2024	23/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	7.4	7.8
Electrical Conductivity	µS/cm	10	ISO 17025	42	54
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	1.13	1.29
Chloride	mg/l	0.15	ISO 17025	0.97	1
Fluoride	µg/l	50	ISO 17025	80	180
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	80	76
Nitrate as NO_3	mg/l	0.05	NONE	0.6	0.86
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	17.8	37.6
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002
Total Phenols					
Total Phenols (monohydric) low level	µg/l	1	NONE	< 1.0	1
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16

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Analytical Report Number: 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				182668	182671
Sample Reference				TP202	TP210
Sample Number				3	3
Depth (m)				1.50	1.50
Date Sampled				22/04/2024	23/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Aluminium (dissolved)	µg/l	12	ISO 17025	28	720
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	1.3	2.2
Barium (dissolved)	µg/l	0.05	ISO 17025	3.4	13
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	< 0.4	1.2
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	3.9	11
Iron (dissolved)	mg/l	0.004	ISO 17025	0.008	0.49
Lead (dissolved)	µg/l	1	ISO 17025	1.9	2.5
Manganese (dissolved)	µg/l	0.06	ISO 17025	33	54
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	0.8	0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	< 0.3	0.9
Silver (dissolved)	µg/l	1	NONE	< 1.0	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	0.91	0.77

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

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Analytical Report Number : 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
182666	BH302B	3	1.00-1.20	Brown loam and clay with stones and vegetation
182667	TP202	1	0.5	Brown loam and sand with gravel and stones
182669	TP204	1	0.5	Brown loam and sand with stones and plastic
182670	TP204	4	2	Brown loam and clay with stones and vegetation
182672	TP210	5	2.5	Brown loam and clay with stones and vegetation

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Analytical Report Number : 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

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Analytical Report Number : 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

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Analytical Report Number : 24-016568
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

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Analytical Report Number : 24-018446

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	07/05/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	15/05/2024
Report Issue Number:	1	**Report issued on:**	15/05/2024
Samples Analysed:	4 soil samples - 2 leachate samples		

Signed: JSzwagrak

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

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

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

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

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

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

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Analytical Report Number: 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192804	192805	192806	192807
Sample Reference				TP203	TP207A	TP207A	TP208
Sample Number				1	1	3	2
Depth (m)				0.50	0.50	1.50	1.00
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	34.7	65.5	85	< 0.1
Moisture Content	%	0.01	NONE	13	9.7	6.6	17
Total mass of sample received	kg	0.1	NONE	1.7	1.6	1.7	1.6
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	-	DSO
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	9.6	11.1	11.6	8.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.339	0.066
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	690	280	230	210
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	116	105
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	343	138	-	105
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	45	1.9
Total Sulphur	mg/kg	50	MCERTS	-	-	1100	310
Total Sulphur	%	0.005	MCERTS	-	-	0.115	0.031
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	-	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	< 0.05	< 0.05
Organic Matter (automated)	%	0.1	MCERTS	2.4	1.2	-	2.7
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.14	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.2	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.58	0.08	-	0.07
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.61	0.09	-	0.21
Pyrene	mg/kg	0.05	MCERTS	0.54	< 0.05	-	0.22
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.33	0.08	-	0.23
Chrysene	mg/kg	0.05	MCERTS	0.41	0.1	-	0.37
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.5	0.14	-	0.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.15	< 0.05	-	0.19
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.34	0.08	-	0.41
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.23	0.09	-	0.28
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	0.08
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.25	0.09	-	0.3
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	4.27	< 0.80	-	2.96

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Analytical Report Number: 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192804	192805	192806	192807
Sample Reference				TP203	TP207A	TP207A	TP208
Sample Number				1	1	3	2
Depth (m)				0.50	0.50	1.50	1.00
Date Sampled				01/05/2024	01/05/2024	01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	9.4	-	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.39	0.45	-	0.57
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	< 0.2	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5	-	0.3
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8
Chromium (III)	mg/kg	1	NONE	22	15	-	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	15	-	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	18	-	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	20	-	16
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	9.7	-	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	20	-	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	100	-	61
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	< 2.5	4.1
Magnesium (water soluble)	mg/kg	5	NONE	-	-	< 5.0	8.3

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

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Analytical Report Number: 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192804	192807
Sample Reference				TP203	TP208
Sample Number				1	2
Depth (m)				0.50	1.00
Date Sampled				01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	8.3	8.2
Electrical Conductivity	µS/cm	10	ISO 17025	250	100
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	74	4.2
Chloride	mg/l	0.15	ISO 17025	5.1	1
Fluoride	µg/l	50	ISO 17025	230	320
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	150	29
Nitrate as NO_3	mg/l	0.05	NONE	0.05	1.04
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0	25
Hardness - Total	mgCaCO3/l	1	ISO 17025	144	60.9
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002
Total Phenols					
Total Phenols (monohydric) low level	µg/l	1	NONE	2.6	2
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16

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Analytical Report Number: 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192804	192807
Sample Reference				TP203	TP208
Sample Number				1	2
Depth (m)				0.50	1.00
Date Sampled				01/05/2024	01/05/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Aluminium (dissolved)	µg/l	12	ISO 17025	830	62
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	4.1	1.8
Barium (dissolved)	µg/l	0.05	ISO 17025	14	9.3
Boron (dissolved)	µg/l	10	ISO 17025	41	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.3	1.2
Cobalt (dissolved)	µg/l	0.3	ISO 17025	0.6	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	35	8
Iron (dissolved)	mg/l	0.004	ISO 17025	0.42	0.19
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	190	57
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	3.6	1.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.5	< 0.3
Silver (dissolved)	µg/l	1	NONE	< 1.0	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	6.2	1.8

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

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Analytical Report Number : 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192804	TP203	1	0.5	Brown sandy clay with gravel and stones
192805	TP207A	1	0.5	Brown loam and sand with vegetation and stones
192806	TP207A	3	1.5	Brown loam and clay with vegetation and stones
192807	TP208	2	1	Brown clay and loam with gravel and vegetation

Analytical Report Number : 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

Analytical Report Number : 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

Analytical Report Number : 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

Sample Deviation Report

Analytical Report Number : 24-018446
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP203	1	S	192804	c	Total cyanide in soil	L080	c
TP207A	1	S	192805	c	Total cyanide in soil	L080	c
TP208	2	S	192807	c	Total cyanide in soil	L080	c

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Analytical Report Number : 24-018448

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	07/05/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	14/05/2024
Report Issue Number:	1	**Report issued on:**	16/05/2024
Samples Analysed:	4 soil samples - 2 leachate samples		

Signed:

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

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

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

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

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

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

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

Analytical Report Number: 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192810	192812	192813	192814
Sample Reference				BH305	BH305	BH305	TP216
Sample Number				1	3	5	1
Depth (m)				0.10-0.30	0.90-1.10	2.50-2.60	0.50
Date Sampled				30/04/2024	30/04/2024	01/05/2024	30/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	67.3
Moisture Content	%	0.01	NONE	21	16	10	10
Total mass of sample received	kg	0.1	NONE	1.7	1.8	1.1	1.6
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSO	DSO	-	DSO
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	7.6	9.7	9.2	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.066	0.079	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	28	210	290	42
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	103	146	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	14	103	-	20.9
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	16	20	-
Total Sulphur	mg/kg	50	MCERTS	-	280	300	-
Total Sulphur	%	0.005	MCERTS	-	0.028	0.03	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	< 0.5	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.05	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	3.1	1.6	-	1.2
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	< 2.0	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	< 2.0	< 2.0	-
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.22	< 0.05	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.07	< 0.05	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.8	< 0.05	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.65	< 0.05	-	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.58	< 0.05	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.78	< 0.05	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.96	< 0.05	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.35	< 0.05	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.65	< 0.05	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.49	< 0.05	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.13	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.51	< 0.05	-	< 0.05
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	6.19	< 0.80	-	< 0.80

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Analytical Report Number: 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192810	192812	192813	192814
Sample Reference				BH305	BH305	BH305	TP216
Sample Number				1	3	5	1
Depth (m)				0.10-0.30	0.90-1.10	2.50-2.60	0.50
Date Sampled				30/04/2024	30/04/2024	01/05/2024	30/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11	-	6.1
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.75	0.65	-	0.7
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8
Chromium (III)	mg/kg	1	NONE	20	16	-	28
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	16	-	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	18	-	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	18	-	9.1
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	17	-	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	22	-	35
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	77	-	37

Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	< 2.5	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	-	< 5.0	< 5.0	-

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

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Analytical Report Number: 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192811	192815
Sample Reference				BH305	TP216
Sample Number				2	2
Depth (m)				0.50-0.70	1.00
Date Sampled				30/04/2024	30/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	8	8.2
Electrical Conductivity	µS/cm	10	ISO 17025	86	76
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	1.81	1.98
Chloride	mg/l	0.15	ISO 17025	0.8	0.33
Fluoride	µg/l	50	ISO 17025	220	160
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	51	24
Nitrate as NO_3	mg/l	0.05	NONE	0.47	< 0.05
Nitrite as NO_2	µg/l	5	ISO 17025	15	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	48.8	46.5
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002
Total Phenols					
Total Phenols (monohydric) low level	µg/l	1	NONE	2.1	1.8
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16

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Analytical Report Number: 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192811	192815
Sample Reference				BH305	TP216
Sample Number				2	2
Depth (m)				0.50-0.70	1.00
Date Sampled				30/04/2024	30/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Aluminium (dissolved)	µg/l	12	ISO 17025	1300	850
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	1.1
Barium (dissolved)	µg/l	0.05	ISO 17025	20	8.1
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	2	1.2
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	12	7.8
Iron (dissolved)	mg/l	0.004	ISO 17025	1.1	0.61
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	1.9
Manganese (dissolved)	µg/l	0.06	ISO 17025	61	44
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.4	0.5
Silver (dissolved)	µg/l	1	NONE	< 1.0	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	4.4
Vanadium (dissolved)	µg/l	1.7	ISO 17025	3.1	< 1.7

Sodium (dissolved)	mg/l	0.01	ISO 17025	1.4	1.2

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

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

Analytical Report Number : 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192810	BH305	1	0.10-0.30	Brown loam and clay with gravel and vegetation
192812	BH305	3	0.90-1.10	Brown clay with gravel and vegetation
192813	BH305	5	2.50-2.60	Brown clay and sand with gravel
192814	TP216	1	0.5	Brown clay and sand with gravel and stones

Analytical Report Number : 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

Analytical Report Number : 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

Analytical Report Number : 24-018448
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

Sample Deviation Report

Analytical Report Number : 24-018448

Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH305	1	S	192810	c	Total cyanide in soil	L080	c
BH305	3	S	192812	c	Total cyanide in soil	L080	c
TP216	1	S	192814	c	Total cyanide in soil	L080	c

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Analytical Report Number : 24-018451

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	09/05/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	14/05/2024
Report Issue Number:	1	**Report issued on:**	14/05/2024
Samples Analysed:	3 soil samples		

Signed:

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

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

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

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

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

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

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

Analytical Report Number: 24-018451
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192820	192821	192822
Sample Reference				BH307	TP218	TP219
Sample Number				1	1	2
Depth (m)				0.10-0.30	0.50	1.00
Date Sampled				07/05/2024	07/05/2024	07/05/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	30.4
Moisture Content	%	0.01	NONE	23	8.8	14
Total mass of sample received	kg	0.1	NONE	1.5	1.5	1.5
Asbestos						
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ	SSZ	SSZ
General Inorganics						
pH (L099)	pH Units	N/A	MCERTS	7.5	7	7.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	27	120	170
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	13.4	58.8	86.3
Organic Matter (automated)	%	0.1	MCERTS	5.9	0.9	2.1
Total Phenols						
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Speciated PAHs						
Naphthalene	mg/kg	0.05	MCERTS	0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.13	< 0.05	0.07
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.08
Pyrene	mg/kg	0.05	MCERTS	0.18	< 0.05	0.07
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.15	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.23	< 0.05	0.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.27	< 0.05	0.09
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.1	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.2	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.15	< 0.05	< 0.05
Total PAH						
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.9	< 0.80	< 0.80

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Analytical Report Number: 24-018451
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192820	192821	192822
Sample Reference				BH307	TP218	TP219
Sample Number				1	1	2
Depth (m)				0.10-0.30	0.50	1.00
Date Sampled				07/05/2024	07/05/2024	07/05/2024
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	6.4	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	1.3	0.86
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	20	24	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	24	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	27	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	44	11	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	37	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	25	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	76	95

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

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Analytical Report Number : 24-018451
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192820	BH307	1	0.10-0.30	Brown loam with gravel and vegetation
192821	TP218	1	0.5	Brown clay and sand
192822	TP219	2	1	Brown sand with gravel and stones

Analytical Report Number : 24-018451
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

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Analytical Report Number : 24-018460

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	07/05/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	15/05/2024
Report Issue Number:	1	**Report issued on:**	15/05/2024
Samples Analysed:	7 soil samples - 2 leachate samples		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192834	192835	192836	192837	192838
Sample Reference				TP205	TP205	TP213	TP217B	BH304
Sample Number				3	4	3	2	1
Depth (m)				1.50	2.00	1.50	1.00	0.10-0.30
Date Sampled				25/04/2024	25/04/2024	26/04/2024	25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	62.8	62.2	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.6	9.1	15	11	18
Total mass of sample received	kg	0.1	NONE	1.3	1.7	1.5	1.6	1.5
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	-	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	KSZ	-	KSZ	KSZ	KSZ
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	10.5	10.4	8.5	8.3	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.444	-	0.021	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	890	710	190	16	19
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	354	-	8.22	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	447	-	94.5	8.22	9.49
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	15	-	1.7	-
Total Sulphur	mg/kg	50	MCERTS	-	1600	-	94	-
Total Sulphur	%	0.005	MCERTS	-	0.157	-	0.009	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	< 0.5	-	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.05	-	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	1.5	-	3	1.9	5.2
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	< 2.0	-	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	< 2.0	-	< 2.0	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.1	-	0.06	< 0.05	0.19
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	0.12
Acenaphthene	mg/kg	0.05	MCERTS	0.66	-	0.3	< 0.05	0.24
Fluorene	mg/kg	0.05	MCERTS	0.69	-	0.16	< 0.05	0.18
Phenanthrene	mg/kg	0.05	MCERTS	4	-	1.3	0.06	1.8
Anthracene	mg/kg	0.05	MCERTS	0.96	-	0.15	< 0.05	0.35
Fluoranthene	mg/kg	0.05	MCERTS	5.8	-	2.5	0.08	4.1
Pyrene	mg/kg	0.05	MCERTS	4.3	-	2.1	0.06	3.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3	-	1.4	< 0.05	2.2
Chrysene	mg/kg	0.05	MCERTS	3.5	-	2	0.09	2.6
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	4.2	-	2.7	< 0.05	3.3
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.3	-	1	< 0.05	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.9	-	1.8	< 0.05	2.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6	-	1.3	< 0.05	1.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.75	-	0.57	< 0.05	0.59
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.6	-	1.5	< 0.05	1.5
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	35.2	-	18.7	< 0.80	25.6

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Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192834	192835	192836	192837	192838
Sample Reference				TP205	TP205	TP213	TP217B	BH304
Sample Number				3	4	3	2	1
Depth (m)				1.50	2.00	1.50	1.00	0.10-0.30
Date Sampled				25/04/2024	25/04/2024	26/04/2024	25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	14	14	24
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.45	-	0.87	0.75	0.91
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	-	< 0.2	< 0.2	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	-	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	17	-	19	19	37
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	-	19	19	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	-	36	19	61
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	-	34	17	100
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	9.5	-	23	24	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	18	-	25	25	50
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	78	-	86	73	230
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	< 2.5	-	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	-	< 5.0	-	< 5.0	-

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

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Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192839	192840
Sample Reference				BH304	BH304
Sample Number				2	3
Depth (m)				0.50-0.70	0.90-1.10
Date Sampled				25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	50.3	< 0.1
Moisture Content	%	0.01	NONE	11	8.7
Total mass of sample received	kg	0.1	NONE	1.6	1.7
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	-	KSZ
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	8.2	8.2
Total Cyanide	mg/kg	1	MCERTS	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	0.025	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	17	25
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	8.27	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	12.5
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	1.6	-
Total Sulphur	mg/kg	50	MCERTS	100	-
Total Sulphur	%	0.005	MCERTS	0.01	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	-	0.9
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	-
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	0.28
Fluorene	mg/kg	0.05	MCERTS	-	0.23
Phenanthrene	mg/kg	0.05	MCERTS	-	1.1
Anthracene	mg/kg	0.05	MCERTS	-	0.28
Fluoranthene	mg/kg	0.05	MCERTS	-	2.4
Pyrene	mg/kg	0.05	MCERTS	-	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	1.8
Chrysene	mg/kg	0.05	MCERTS	-	2.4
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	2.8
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	1.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	2
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	1.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	0.6
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	1.1
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	19.1

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Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192839	192840
Sample Reference				BH304	BH304
Sample Number				2	3
Depth (m)				0.50-0.70	0.90-1.10
Date Sampled				25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	8.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	0.73
Boron (water soluble)	mg/kg	0.2	MCERTS	-	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	< 1.8
Chromium (III)	mg/kg	1	NONE	-	16
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	12
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	19
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	63
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	-

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

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Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192834	192837
Sample Reference				TP205	TP217B
Sample Number				3	2
Depth (m)				1.50	1.00
Date Sampled				25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	10.3	8.2
Electrical Conductivity	µS/cm	10	ISO 17025	290	84
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	107	1.78
Chloride	mg/l	0.15	ISO 17025	1.7	0.49
Fluoride	µg/l	50	ISO 17025	310	210
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	27	25
Nitrate as NO_3	mg/l	0.05	NONE	0.05	0.47
Nitrite as NO_2	µg/l	5	ISO 17025	12	20
Hardness - Total	mgCaCO3/l	1	ISO 17025	165	50
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002
Total Phenols					
Total Phenols (monohydric) low level	µg/l	1	NONE	2.5	2.2
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	0.1	0.12
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	0.69	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0.18	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	0.33	0.15
Anthracene	µg/l	0.01	ISO 17025	0.09	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.23	< 0.01
Pyrene	µg/l	0.01	ISO 17025	0.14	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	NONE	1.76	0.27

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Analytical Report Number: 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192834	192837
Sample Reference				TP205	TP217B
Sample Number				3	2
Depth (m)				1.50	1.00
Date Sampled				25/04/2024	25/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Aluminium (dissolved)	µg/l	12	ISO 17025	280	52
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	9.1	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	27	9.7
Boron (dissolved)	µg/l	10	ISO 17025	62	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	4.3	< 0.4
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	36	6.2
Iron (dissolved)	mg/l	0.004	ISO 17025	0.27	0.082
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	41	48
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	1.4	0.7
Nickel (dissolved)	µg/l	0.3	ISO 17025	3.9	< 0.3
Silver (dissolved)	µg/l	1	NONE	< 1.0	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	57	< 1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	3.4	1.5

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Analytical Report Number : 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192834	TP205	3	1.5	Brown sand with gravel and stones
192835	TP205	4	2	Brown sand with gravel and stones
192836	TP213	3	1.5	Brown loam and clay with gravel
192837	TP217B	2	1	Brown loam and sand with gravel and vegetation
192838	BH304	1	0.10-0.30	Brown sand with gravel and vegetation
192839	BH304	2	0.50-0.70	Brown sand with gravel and stones
192840	BH304	3	0.90-1.10	Brown sand with gravel

Analytical Report Number : 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

Analytical Report Number : 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

Analytical Report Number : 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

Sample Deviation Report

Analytical Report Number : 24-018460
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH304	1	S	192838	c	Total cyanide in soil	L080	c
BH304	3	S	192840	c	Total cyanide in soil	L080	c
TP205	3	S	192834	c	Total cyanide in soil	L080	c
TP213	3	S	192836	c	Total cyanide in soil	L080	c
TP217B	2	S	192837	c	Total cyanide in soil	L080	c

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Analytical Report Number : 24-018462

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	07/05/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	14/05/2024
Report Issue Number:	1	**Report issued on:**	15/05/2024
Samples Analysed:	4 soil samples - 1 leachate sample		

Signed: JSzwagrak

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

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

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

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

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

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

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

Analytical Report Number: 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192842	192843	192844	192845
Sample Reference				TP102	BH303B	BH303B	BH303B
Sample Number				1	1	2	3
Depth (m)				0.50	0.10-0.30	0.50-0.70	1.00-1.20
Date Sampled				02/05/2024	02/05/2024	02/05/2024	02/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Stone Content	%	0.1	NONE	50.9	< 0.1	< 0.1	93.7
Moisture Content	%	0.01	NONE	5.8	16	15	12
Total mass of sample received	kg	0.1	NONE	1.8	1.4	1.6	1.6
Asbestos							
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	PDO	PDO	-	PDO
General Inorganics							
pH (L099)	pH Units	N/A	MCERTS	9	8.5	11.7	12.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.338	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	510	61	360	18
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	179	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	256	30.4	-	9.19
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	56	-
Total Sulphur	mg/kg	50	MCERTS	-	-	1200	-
Total Sulphur	%	0.005	MCERTS	-	-	0.117	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	-	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	2.3	4.5	-	0.9
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	-
Total Phenols							
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	< 1.0
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	0.66	0.22	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.87	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	15	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	11	0.12	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	54	0.68	-	< 0.05
Anthracene	mg/kg	0.05	MCERTS	16	< 0.05	-	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	120	1.1	-	< 0.05
Pyrene	mg/kg	0.05	MCERTS	90	0.89	-	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	93	0.77	-	< 0.05
Chrysene	mg/kg	0.05	MCERTS	100	1.1	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	130	1.6	-	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	47	0.41	-	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	97	0.85	-	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	38	0.69	-	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	14	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	37	0.7	-	< 0.05
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	863	9.05	-	< 0.80

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

Analytical Report Number: 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192842	192843	192844	192845
Sample Reference				TP102	BH303B	BH303B	BH303B
Sample Number				1	1	2	3
Depth (m)				0.50	0.10-0.30	0.50-0.70	1.00-1.20
Date Sampled				02/05/2024	02/05/2024	02/05/2024	02/05/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**				
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6	16	-	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.49	0.78	-	0.35
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.3	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	< 1.8
Chromium (III)	mg/kg	1	NONE	14	16	-	19
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	16	-	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8	33	-	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	46	-	28
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	19	-	9.9
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.3	1.4	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	23	-	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	97	-	74

Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	-	-	< 5.0	-

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

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4041

Analytical Report Number: 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192845
Sample Reference				BH303B
Sample Number				3
Depth (m)				1.00-1.20
Date Sampled				02/05/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	8.3
Electrical Conductivity	µS/cm	10	ISO 17025	87
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	11.7
Chloride	mg/l	0.15	ISO 17025	0.2
Fluoride	µg/l	50	ISO 17025	120
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	30
Nitrate as NO_3	mg/l	0.05	NONE	< 0.05
Nitrite as NO_2	µg/l	5	ISO 17025	17
Hardness - Total	mgCaCO3/l	1	ISO 17025	45.9
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (monohydric) low level	µg/l	1	NONE	1.4
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16

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Analytical Report Number: 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192845
Sample Reference				BH303B
Sample Number				3
Depth (m)				1.00-1.20
Date Sampled				02/05/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	12	ISO 17025	200
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	5.6
Barium (dissolved)	µg/l	0.05	ISO 17025	23
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.6
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	6.3
Iron (dissolved)	mg/l	0.004	ISO 17025	< 0.004
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	58
Mercury - CV-AFS	µg/l	0.007	ISO 17025	0.0209
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	< 0.3
Silver (dissolved)	µg/l	1	NONE	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	3
Sodium (dissolved)	mg/l	0.01	ISO 17025	1.3

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

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Analytical Report Number : 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192842	TP102	1	0.5	Brown sand with gravel and stones
192843	BH303B	1	0.10-0.30	Brown clay and sand with gravel and vegetation
192844	BH303B	2	0.50-0.70	Brown clay and sand with gravel and vegetation
192845	BH303B	3	1.00-1.20	Non Soil. *b

Analytical Report Number : 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

Analytical Report Number : 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

Analytical Report Number : 24-018462
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

*b - Unaccredited sample matrix.

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Analytical Report Number : 24-018472

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	07/05/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	09/05/2024
Your order number:		**Analysis completed by:**	14/05/2024
Report Issue Number:	1	**Report issued on:**	15/05/2024
Samples Analysed:	6 soil samples - 2 leachate samples		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192889	192890	192891	192892	192893
Sample Reference				TP206A	TP211	TP212	TP212	TP214
Sample Number				1	3	2	4	1
Depth (m)				0.50	1.50	1.00	2.00	0.50
Date Sampled				29/04/2024	29/04/2024	29/04/2024	29/04/2024	29/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	14	14	8.4	12
Total mass of sample received	kg	0.1	NONE	0.7	1.6	1.7	1.8	1.6
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	IZJ	IZJ	IZJ	IZJ	IZJ
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	8.1	7.9	8	8	6.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.029	0.018	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	16	59	24	14	37
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	12.1	7.14	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	7.84	29.5	12.1	7.14	18.5
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	2	2.3	-
Total Sulphur	mg/kg	50	MCERTS	-	-	160	60	-
Total Sulphur	%	0.005	MCERTS	-	-	0.016	0.006	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	-	< 0.5	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Organic Matter (automated)	%	0.1	MCERTS	2.4	2.4	2	1.6	2.4
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0	< 2.0	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80

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Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192889	192890	192891	192892	192893
Sample Reference				TP206A	TP211	TP212	TP212	TP214
Sample Number				1	3	2	4	1
Depth (m)				0.50	1.50	1.00	2.00	0.50
Date Sampled				29/04/2024	29/04/2024	29/04/2024	29/04/2024	29/04/2024
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11	13	13	13
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.45	0.48	0.54	0.75	0.74
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	15	16	17	16	19
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	16	17	16	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	13	18	21	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	10	16	13	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	23	19	30	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	20	17	24	22	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	52	61	65	67	76
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	3	< 2.5	-
Magnesium (water soluble)	mg/kg	5	NONE	-	-	5.9	< 5.0	-

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

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Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192894
Sample Reference				TP214
Sample Number				5
Depth (m)				2.50
Date Sampled				29/04/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	21
Total mass of sample received	kg	0.1	NONE	1.7
Asbestos				
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	-
General Inorganics				
pH (L099)	pH Units	N/A	MCERTS	7.1
Total Cyanide	mg/kg	1	MCERTS	-
Total Sulphate as SO_4	%	0.005	MCERTS	0.028
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	67
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	33.2
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	-
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	19
Total Sulphur	mg/kg	50	MCERTS	250
Total Sulphur	%	0.005	MCERTS	0.025
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	4.7
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	0.29
Organic Matter (automated)	%	0.1	MCERTS	-
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0
Total Phenols				
Total Phenols (monohydric)	mg/kg	1	MCERTS	-
Speciated PAHs				
Naphthalene	mg/kg	0.05	MCERTS	-
Acenaphthylene	mg/kg	0.05	MCERTS	-
Acenaphthene	mg/kg	0.05	MCERTS	-
Fluorene	mg/kg	0.05	MCERTS	-
Phenanthrene	mg/kg	0.05	MCERTS	-
Anthracene	mg/kg	0.05	MCERTS	-
Fluoranthene	mg/kg	0.05	MCERTS	-
Pyrene	mg/kg	0.05	MCERTS	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-
Chrysene	mg/kg	0.05	MCERTS	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-
Total PAH				
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-

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Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192894
Sample Reference				TP214
Sample Number				5
Depth (m)				2.50
Date Sampled				29/04/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-
Chromium (III)	mg/kg	1	NONE	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	2.9
Magnesium (water soluble)	mg/kg	5	NONE	5.7

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

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Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192890	192893
Sample Reference				TP211	TP214
Sample Number				3	1
Depth (m)				1.50	0.50
Date Sampled				29/04/2024	29/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
General Inorganics					
pH (automated)	pH Units	N/A	ISO 17025	8.1	7.3
Electrical Conductivity	µS/cm	10	ISO 17025	100	17
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	3.66	3.91
Chloride	mg/l	0.15	ISO 17025	< 0.15	0.87
Fluoride	µg/l	50	ISO 17025	200	< 50
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	31	97
Nitrate as NO_3	mg/l	0.05	NONE	0.05	1.25
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0	15
Hardness - Total	mgCaCO3/l	1	ISO 17025	62.5	6.3
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002
Total Phenols					
Total Phenols (monohydric) low level	µg/l	1	NONE	1.5	1.5
Speciated PAHs					
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01
Total PAH					
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16	< 0.16

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Analytical Report Number: 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				192890	192893
Sample Reference				TP211	TP214
Sample Number				3	1
Depth (m)				1.50	0.50
Date Sampled				29/04/2024	29/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Aluminium (dissolved)	µg/l	12	ISO 17025	580	26
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0
Barium (dissolved)	µg/l	0.05	ISO 17025	9.9	1.4
Boron (dissolved)	µg/l	10	ISO 17025	< 10	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.3	0.5
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	11	8.4
Iron (dissolved)	mg/l	0.004	ISO 17025	0.36	0.008
Lead (dissolved)	µg/l	1	ISO 17025	1.2	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	53	33
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	< 0.4	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.5	0.5
Silver (dissolved)	µg/l	1	NONE	< 1.0	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	2.2	< 1.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	1	1.4

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

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Analytical Report Number : 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
192889	TP206A	1	0.5	Brown loam and sand with gravel and stones
192890	TP211	3	1.5	Brown loam and sand with gravel and stones
192891	TP212	2	1	Brown sand with gravel and vegetation
192892	TP212	4	2	Brown sand with gravel and stones
192893	TP214	1	0.5	Brown sandy clay with gravel
192894	TP214	5	2.5	Brown sand with gravel and stones

Analytical Report Number : 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025

Analytical Report Number : 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078B	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS

Analytical Report Number : 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

Sample Deviation Report

Analytical Report Number : 24-018472
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP206A	1	S	192889	c	Total cyanide in soil	L080	c
TP211	3	S	192890	c	Total cyanide in soil	L080	c
TP212	2	S	192891	c	Total cyanide in soil	L080	c
TP212	4	S	192892	c	Total cyanide in soil	L080	c
TP214	1	S	192893	c	Total cyanide in soil	L080	c

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Analytical Report Number : 24-018668

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	10/05/2024
Your job number:	38113-BA	**Samples instructed on/ Analysis started on:**	10/05/2024
Your order number:		**Analysis completed by:**	16/05/2024
Report Issue Number:	1	**Report issued on:**	16/05/2024
Samples Analysed:	1 soil sample - 1 leachate sample		

Signed:

Dominika Liana
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				194149
Sample Reference				BH307
Sample Number				3
Depth (m)				0.90-1.00
Date Sampled				08/05/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	31
Moisture Content	%	0.01	NONE	8.4
Total mass of sample received	kg	0.1	NONE	1

Asbestos

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

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	25
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	12.3
Organic Matter (automated)	%	0.1	MCERTS	4.2

Total Phenols

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

Speciated PAHs

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

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80

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Analytical Report Number: 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				194149
Sample Reference				BH307
Sample Number				3
Depth (m)				0.90-1.00
Date Sampled				08/05/2024
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	2.2
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (III)	mg/kg	1	NONE	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	39
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	82

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

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Analytical Report Number: 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				194149
Sample Reference				BH307
Sample Number				3
Depth (m)				0.90-1.00
Date Sampled				08/05/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	7.5
Electrical Conductivity	µS/cm	10	ISO 17025	< 10
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1
Sulphate as SO_4	mg/l	0.045	ISO 17025	1.14
Chloride	mg/l	0.15	ISO 17025	0.65
Fluoride	µg/l	50	ISO 17025	< 50
Ammonium - Exchangeable as NH_4^+	µg/l	15	NONE	22
Nitrate as NO_3	mg/l	0.05	NONE	< 0.05
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	1.7
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (monohydric) low level	µg/l	1	NONE	1.1
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16

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Analytical Report Number: 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				194149
Sample Reference				BH307
Sample Number				3
Depth (m)				0.90-1.00
Date Sampled				08/05/2024
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	12	ISO 17025	24
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	1.2
Barium (dissolved)	µg/l	0.05	ISO 17025	0.35
Boron (dissolved)	µg/l	10	ISO 17025	< 10
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	1.3
Iron (dissolved)	mg/l	0.004	ISO 17025	0.019
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	8.2
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070
Molybdenum (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.7
Silver (dissolved)	µg/l	1	NONE	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7

Sodium (dissolved)	mg/l	0.01	ISO 17025	0.91

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

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Analytical Report Number : 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
194149	BH307	3	0.90-1.00	Brown clay and loam with gravel and stones

Analytical Report Number : 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of leachates	Determination of hardness in leachates by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE

Analytical Report Number : 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Exchangeable Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Mercury Low Level in leachate	Mercury in leachate by CV-AFS	In-house method based on USEPA method 1631	L085B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099	W	ISO 17025
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		ISO 17025

Analytical Report Number : 24-018668
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

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Analytical Report Number : 24-019637

Project / Site name:	Penrhys Village, Rhondda Cynon Taff	**Samples received on:**	15/05/2024
Your job number:	38113 BA	**Samples instructed on/ Analysis started on:**	15/05/2024
Your order number:		**Analysis completed by:**	21/05/2024
Report Issue Number:	1	**Report issued on:**	21/05/2024
Samples Analysed:	2 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Senior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-019637
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				199158	199159
Sample Reference				TP215	TP101
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.50
Date Sampled				30/04/2024	30/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	64.5
Moisture Content	%	0.01	NONE	15	3.8
Total mass of sample received	kg	0.1	NONE	1.3	1.5
Asbestos					
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	SSZ	SSZ
General Inorganics					
pH (L099)	pH Units	N/A	MCERTS	8	9.2
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	17	520
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	8.54	261
Organic Matter (automated)	%	0.1	MCERTS	2.8	0.9
Total Phenols					
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.12
Acenaphthene	mg/kg	0.05	MCERTS	0.17	1.3
Fluorene	mg/kg	0.05	MCERTS	0.15	0.93
Phenanthrene	mg/kg	0.05	MCERTS	0.89	5.6
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.4
Fluoranthene	mg/kg	0.05	MCERTS	1.9	11
Pyrene	mg/kg	0.05	MCERTS	1.4	9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.4	6
Chrysene	mg/kg	0.05	MCERTS	1.8	6.8
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	2.1	11
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.92	4.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	8.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.91	5.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.31	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.95	6.1
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	14.4	76.5

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

Analytical Report Number: 24-019637
Project / Site name: Penrhys Village, Rhondda Cynon Taff

Lab Sample Number				199158	199159
Sample Reference				TP215	TP101
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	0.50
Date Sampled				30/04/2024	30/04/2024
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.45	0.56
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.5
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	14	19
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	8.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	7.1
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	19	24
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	47	39

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

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

Analytical Report Number : 24-019637
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
199158	TP215	None Supplied	0.5	Brown clay and sand with gravel
199159	TP101	None Supplied	0.5	Brown sand with gravel and stones

Analytical Report Number : 24-019637
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated EPA-16 PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099	D	MCERTS

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

Sample Deviation Report

Analytical Report Number : 24-019637
Project / Site name: Penrhys Village, Rhondda Cynon Taff

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

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

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
TP101	N/A	S	199159	c	Total cyanide in soil	L080	c
TP215	N/A	S	199158	c	Total cyanide in soil	L080	c

CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

SOCOTEC Asbestos Limited

Unit 20, The Falcon Business Centre,
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Romford.
RM3 8UR

Telephone: 01708 330760
E-mail: ecs.romford@socotec.com

Client	Geotechnical Engineering Limited	Delivered/Collected	Collected
Address	Centurion House, Olympus Park, Quedgeley, Gloucestershire GL2 4NF	Analysis Report No	R172247
Attention	Brian Allen	Report Date	17/May/2024
Site Address	Penrhys, Heol Pendyrus, Ferndale, CF43 3RG	Site Ref No	278640-1041512
Date Sample Taken	01/05/2024	Page No	1 of 2
Date Sample Received	07/05/2024	No of Samples	20
Date of Analysis	17/05/2024		

SOCOTEC Asbestos SAMPLE No	CLIENT SAMPLE No	SAMPLE LOCATION & DESCRIPTION*	FIBRE TYPE DETECTED	ANALYSIS No
001		Ground Floor - Manhole 02 MH02 - Insulation to pipe (left)	NADIS	278640-1041512-0001-001
002		Ground Floor - Manhole 02 MH02 - Insulation to pipe (right)	NADIS	278640-1041512-0001-002
003		Ground Floor - Manhole 02 MH02 - Insulation to orthogonal pipe	NADIS	278640-1041512-0001-003
004		Ground Floor - Manhole 02 MH02 - Loose Gasket	CHRYSOTILE	278640-1041512-0001-004
005		Ground Floor - Manhole 01 MH01 - Insulation to pipe (left)	NADIS	278640-1041512-0001-005
006		Ground Floor - Manhole 01 MH01 - Insulation to pipe (right)	NADIS	278640-1041512-0001-006
007		Ground Floor - Manhole 03 MH03 - Insulation to pipe (right)	NADIS	278640-1041512-0001-007
008		Ground Floor - Manhole 03 MH03 - Insulation to pipe (left)	NADIS	278640-1041512-0001-008
009		Ground Floor - Manhole 03 MH03 - Insulation to orthogonal pipe	NADIS	278640-1041512-0001-009
010		Ground Floor - Manhole 04 MH04 - Insulation to pipe (left)	NADIS	278640-1041512-0001-010

KEY: NADIS - No Asbestos Detected in Sample.
All samples will be retained for a minimum of 6 Months.

Analysed by:	Name: David O'Flaherty	Authorised signatory:	Name: **JULIJA LUKASIOVA**
	Position: Laboratory Bulk Analyst		Position: **Contract Administrator**

BULK005-VER 17 25-AUG 2023

Samples of material referenced above have been examined using our internal procedure SCI/ASB/007, based on HSE's HSG248, Asbestos: The Analysts guide. If samples have been DELIVERED, the site address and actual sample location is as given by the client at the time of delivery. Where samples have been taken by a third party the results shall apply to the samples as received. SOCOTEC Asbestos Limited is not responsible for the accuracy or competence of the sampling by third parties, and can therefore not be held responsible for any interpretation of the results shown. The Test Report shall not be reproduced except in full without the approval of the inspection body and the client. *Please note that the sample description, material type and comments/observations are opinions and therefore not within the scope of UKAS accreditation. All samples will be retained for a minimum of 6 months whilst all certificates and supporting records are retained for a minimum of 6 years.

SOCOTEC Asbestos Limited is a wholly owned subsidiary of SOCOTEC, registered in England and Wales, registered company 04951688 at SOCOTEC House, Bretby Business Park, Ashby Road, Burton upon Trent, DE15 0YZ.

CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

SOCOTEC Asbestos Limited

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E-mail: ecs.romford@socotec.com

Client	Geotechnical Engineering Limited	Delivered/Collected	Collected
Address	Centurion House, Olympus Park, Quedgeley, Gloucestershire GL2 4NF	Analysis Report No	R172247
Attention	Brian Allen	Report Date	17/May/2024
Site Address	Penrhys, Heol Pendyrus, Ferndale, CF43 3RG	Site Ref No	278640-1041512
Date Sample Taken	01/05/2024	Page No	2 of 2
Date Sample Received	07/05/2024	No of Samples	20
Date of Analysis	17/05/2024		

SOCOTEC Asbestos SAMPLE No	CLIENT SAMPLE No	SAMPLE LOCATION & DESCRIPTION*	FIBRE TYPE DETECTED	ANALYSIS No
011		Ground Floor - Manhole 04 MH04 - Insulation to pipe (right)	NADIS	278640-1041512-0001-011
012		Ground Floor - Manhole 05 MH05 - Insulation to pipe (left)	NADIS	278640-1041512-0001-012
013		Ground Floor - Manhole 05 MH05 - Insulation to orthogonal pipe	NADIS	278640-1041512-0001-013
014		Ground Floor - Manhole 05 MH05 - Insulating board debris	NADIS	278640-1041512-0001-014
015		Ground Floor - Manhole 06 MH06 - Insulation to pipe (left)	NADIS	278640-1041512-0001-015
016		Ground Floor - Manhole 06 MH06 - Insulation to pipe (right)	NADIS	278640-1041512-0001-016
017		Ground Floor - Manhole 07 MH07 - Insulation to pipe (left)	NADIS	278640-1041512-0001-017
018		Ground Floor - Manhole 07 MH07 - Insulation to pipe (right)	NADIS	278640-1041512-0001-018
019		Ground Floor - Manhole 08 MH08 - Insulation to pipe (left)	NADIS	278640-1041512-0001-019
020		Ground Floor - Manhole 08 MH08 - Insulation to pipe (right)	NADIS	278640-1041512-0001-020

KEY: NADIS - No Asbestos Detected in Sample.
All samples will be retained for a minimum of 6 Months.

Analysed by:	Name:	David O'Flaherty	Authorised signatory:	Name:	**JULIJA LUKASIOVA**
	Position:	Laboratory Bulk Analyst		Position:	**Contract Administrator**

BULK005-VER 17 25-AUG 2023

Samples of material referenced above have been examined using our internal procedure SCI/ASB/007, based on HSE's HSG248, Asbestos: The Analysts guide. If samples have been DELIVERED, the site address and actual sample location is as given by the client at the time of delivery. Where samples have been taken by a third party the results shall apply to the samples as received. SOCOTEC Asbestos Limited is not responsible for the accuracy or competence of the sampling by third parties, and can therefore not be held responsible for any interpretation of the results shown. The Test Report shall not be reproduced except in full without the approval of the inspection body and the client. *Please note that the sample description, material type and comments/observations are opinions and therefore not within the scope of UKAS accreditation. All samples will be retained for a minimum of 6 months whilst all certificates and supporting records are retained for a minimum of 6 years.

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Appendix C Geotechnical Assessments

UKAS TESTING
2718

GEOTECHNICAL ENGINEERING LIMITED

Version No.	1
Reason for update	N/A
For the attention of Brian Allen / Simon Phelpstead	Page No. 1 of 48
	Date of Issue 18/06/2024

TEST REPORT

PROJECT/SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	Samples received	17/04/2024
GEL REPORT NUMBER	38113	Schedule received	16/05/2024
Your ref/PO:		Testing commenced	20/05/2024
Test report refers to	Schedule 001	Status	Final

SUMMARY OF RESULTS ATTACHED

TEST METHOD & DESCRIPTION (S) denotes testing was subcontracted		QUANTITY	ACCREDITED TEST
BS EN ISO 17892-1: 2014:5, Water Content		5	YES
BS EN ISO 17892-12:2018, Liquid & Plastic Limits		5	YES
BS EN ISO 17892-4: 2016: 5.2, Particle Size Distribution - Wet Sieve		36	YES
BS EN ISO 17892-4: 2016: 5.4, Particle Size Distribution - Pipette		1	YES
ISRM: Suggested Methods: 2007: Water Content of Rock		4	NO
ISRM Suggested Methods: 1974-2006: Uniaxial Compressive Strength of Rock	(S)	4	YES
ISRM: Suggested Methods: 2007: Point Load Strength Test		16	YES
ISRM: Suggested Methods: 1974-2006: Point Load Strength Test	(S)	1	YES

General Remarks

This report may not be partially reproduced without written permission from this laboratory.
The results reported relate to samples received in the laboratory and the items tested.

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Approved Signatories:
W Jones (Laboratory Manager) J Hanson (Director)
T Best (Deputy Laboratory Manager) N Parry (Director)

Geotechnical Engineering Limited

LIQUID AND PLASTIC LIMITS

BS EN ISO 17892-12:2018

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	specimen preparation and test method	fraction >0.425 mm (%)	liquid limit (%)	plastic limit (%)	plasticity index (%)	description and remarks
BH304	4D	0.50	0.50	14.2	BYE	47	32	21	11	Brown slightly sandy gravelly silty CLAY
BH305	3B	0.50	0.50	17.5	BYE	25	31	19	12	Brown slightly sandy slightly gravelly silty CLAY
BH306	4D	0.50	0.50	18.7	BYE	83	50	40	10	Brown sandy silty GRAVEL
TP213	3D	1.50	1.50	16.7	BYE	52	35	23	12	Brown slightly sandy gravelly silty CLAY
TP215	1B	0.50	0.50	16.8	BYE	53	38	25	13	Brown slightly sandy gravelly silty CLAY

general remarks

natural water content determined in accordance with BS EN ISO 17892 - 1 : 2014 (unless specified)

NP denotes non plastic

# denotes sample tested is smaller than that which is recommended in accordance with BS EN ISO 17892 or BS1377

specimen preparation

A - as received
B - washed on 0.425mm sieve
C - air dried
D - oven dried (60oC)
E - oven dried (105oC)
F - not known

test method

X - cone penetrometer (4 point)
Y - cone penetrometer (1 point)
Z - casagrande apparatus

CONTRACT **38113**

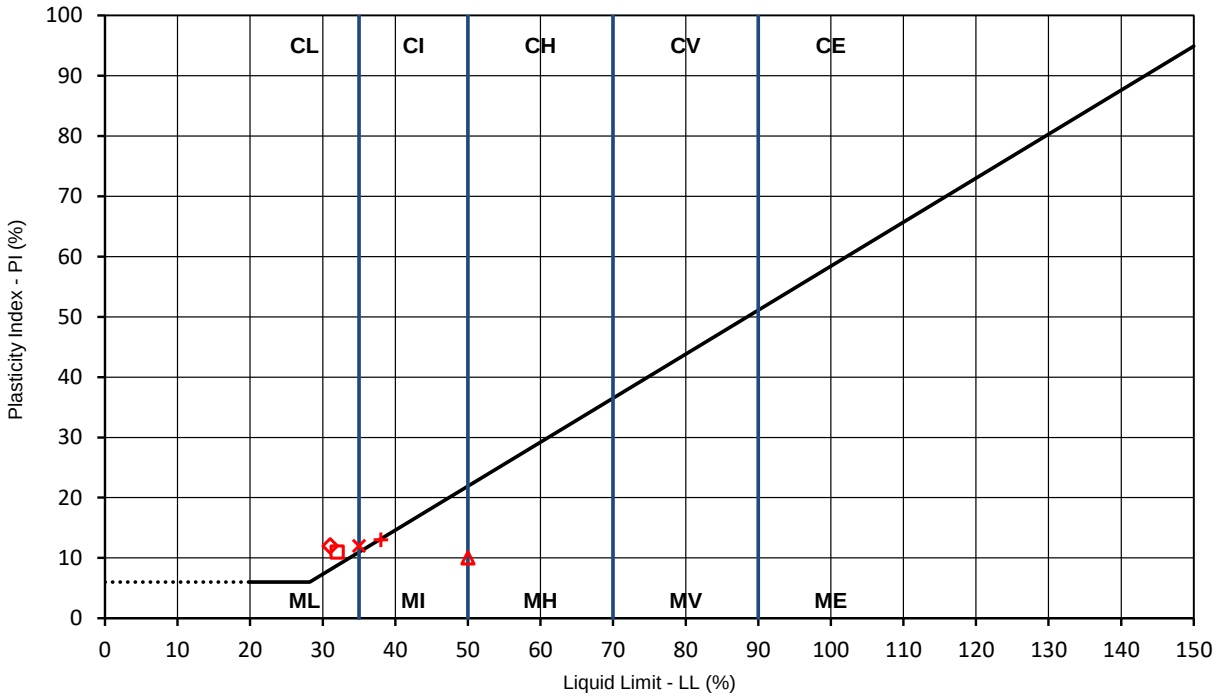
CHECKED **TB**

Geotechnical Engineering Limited

ATTERBERG LINE PLOT

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF



	BH/TP No.	depth (m)	LL	PL	PI	remarks
□	BH304	0.50	32	21	11	
◇	BH305	0.50	31	19	12	
△	BH306	0.50	50	40	10	
×	TP213	1.50	35	23	12	
+	TP215	0.50	38	25	13	

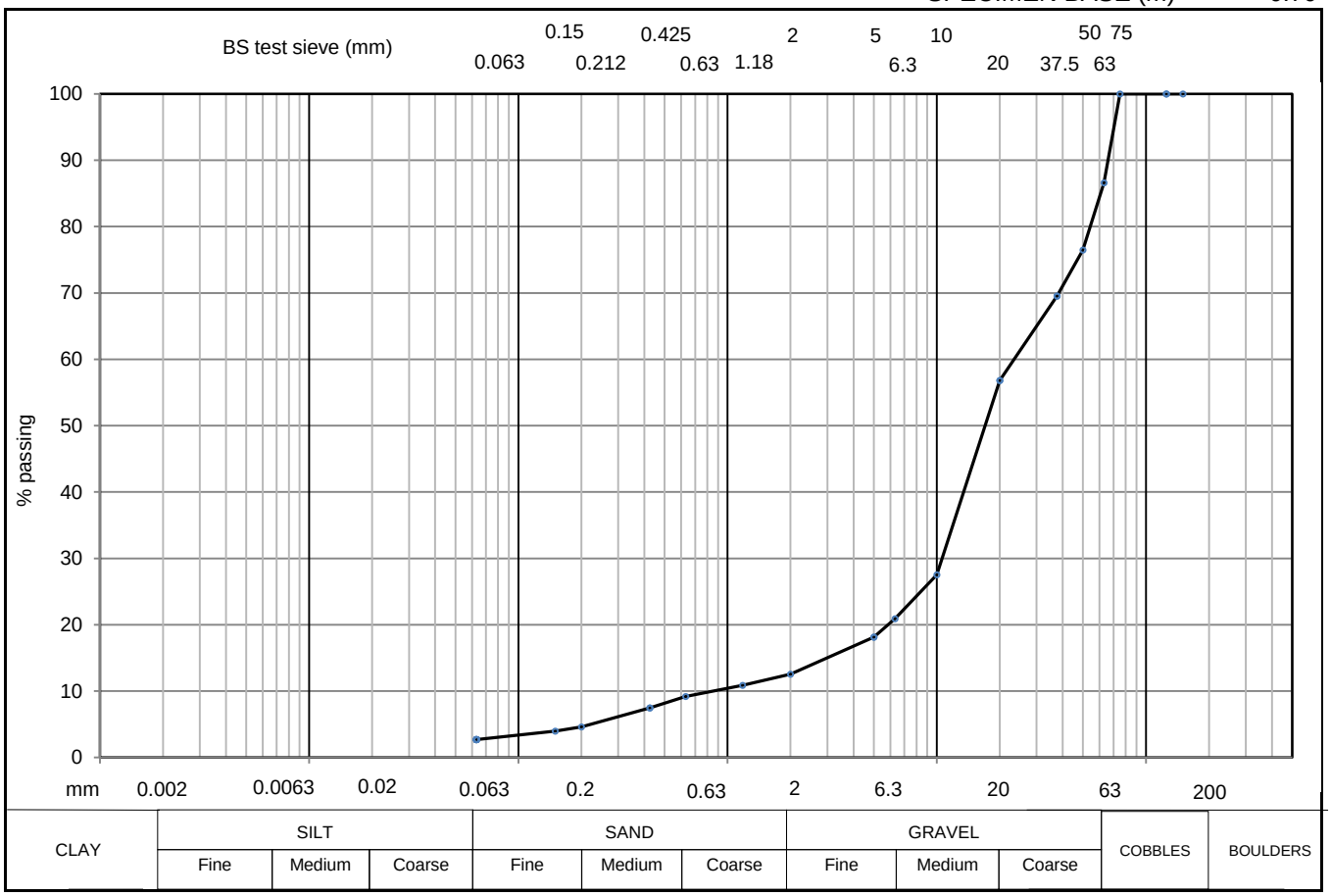
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH301
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown slightly clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	10
GRAVEL	74
COBBLE & BOULDER	13
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	18	20	
75	100	2	13	6	
63	87	1.18	11	2	
50	76	0.63	9		
37.5	70	0.425	7		
20	57	0.2	5		
10	28	0.15	4		
6.3	21	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

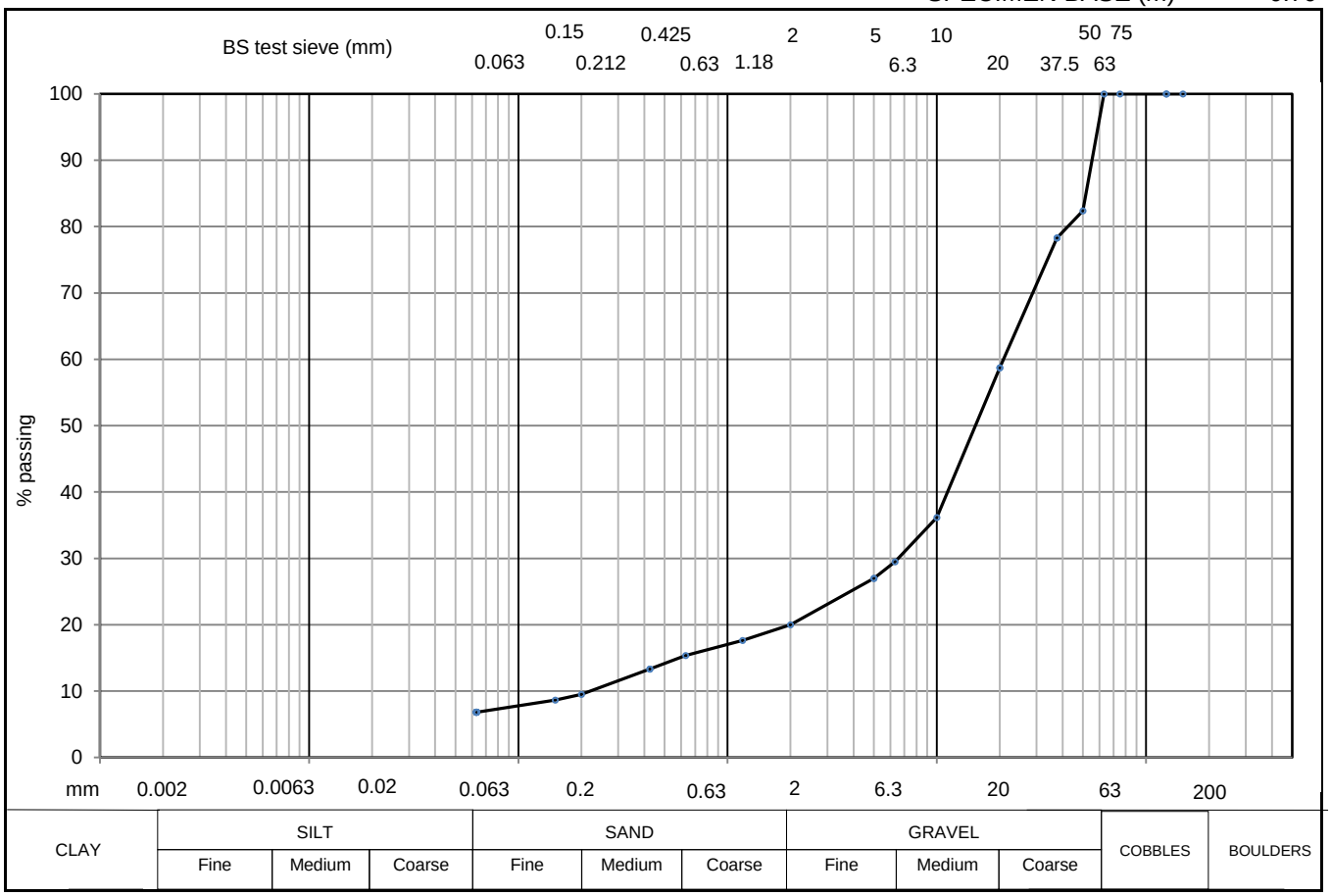
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH302B
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.70



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	13
GRAVEL	80
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	82
37.5	78
20	59
10	36
6.3	30

BS test sieve (mm)	% passing
5	27
2	20
1.18	18
0.63	15
0.425	13
0.2	10
0.15	9
0.063	7

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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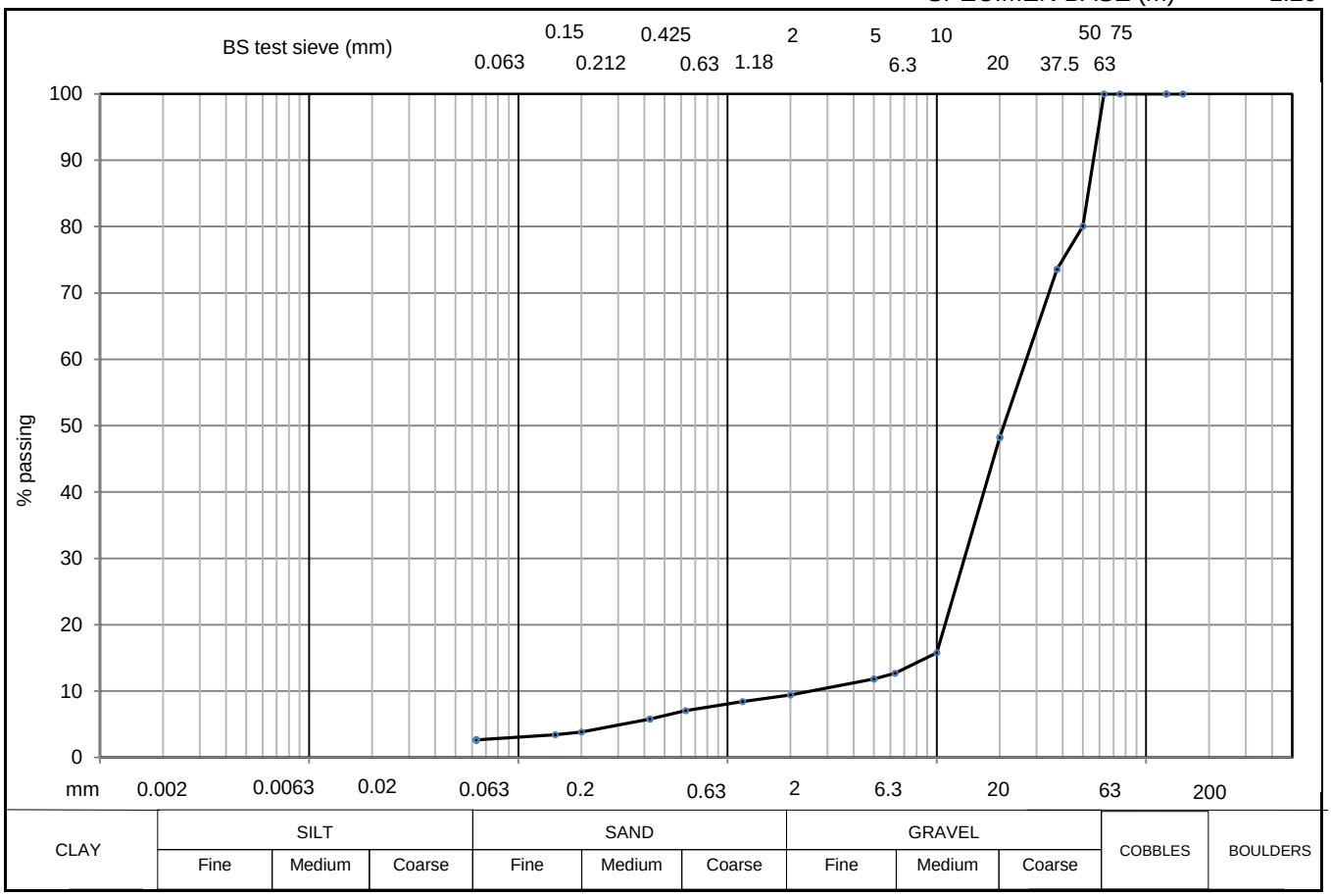
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH303B
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Grey slightly clayey sandy GRAVEL with rare wood fragments	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	1.20



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	7
GRAVEL	91
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	80
37.5	74
20	48
10	16
6.3	13

BS test sieve (mm)	% passing
5	12
2	9
1.18	8
0.63	7
0.425	6
0.2	4
0.15	3
0.063	3

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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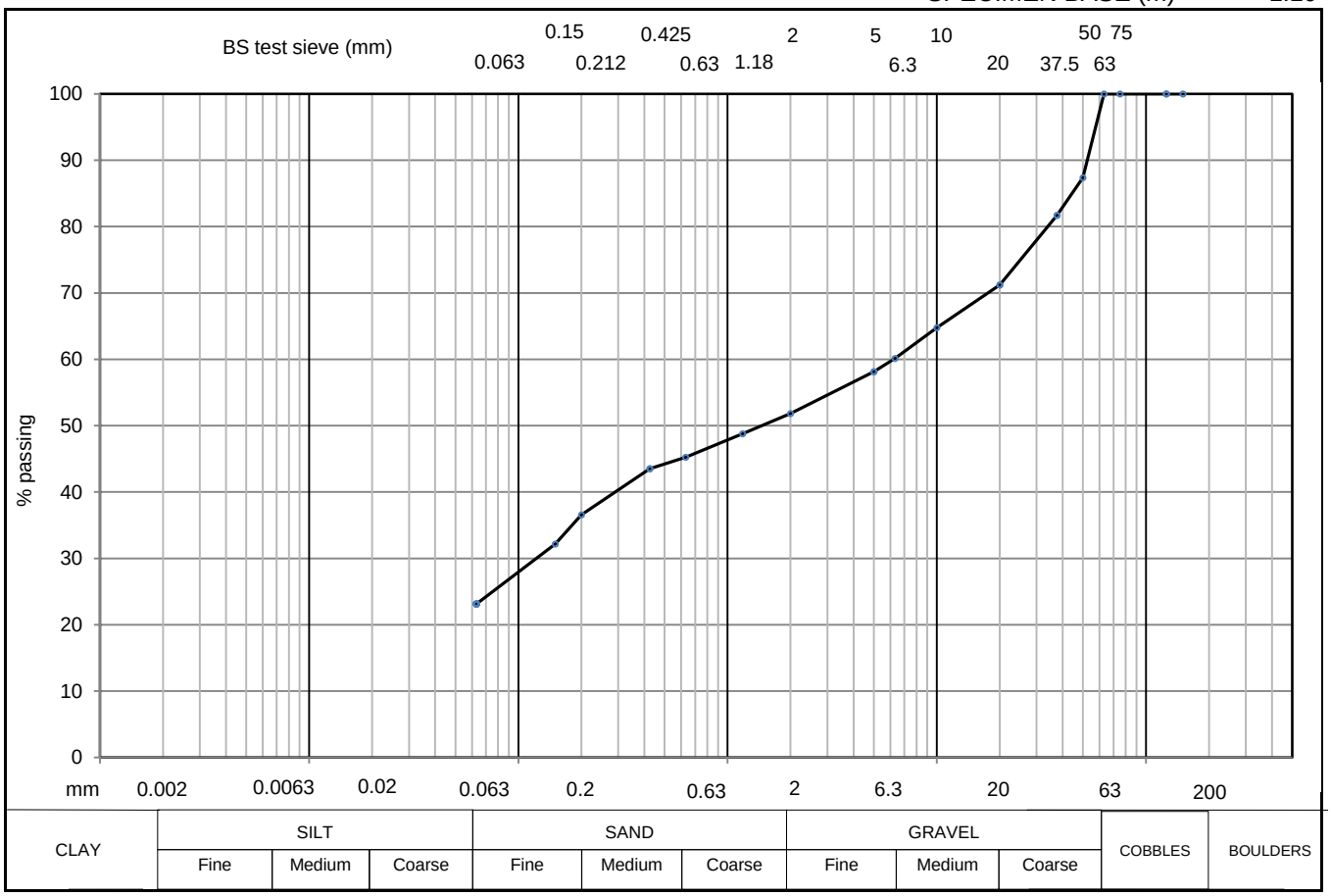
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH304
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.90
DESCRIPTION	Brown very silty very sandy GRAVEL	SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.10



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	29
GRAVEL	48
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	58	20	
75		2	52	6	
63	100	1.18	49	2	
50	87	0.63	45		
37.5	82	0.425	44		
20	71	0.2	37		
10	65	0.15	32		
6.3	60	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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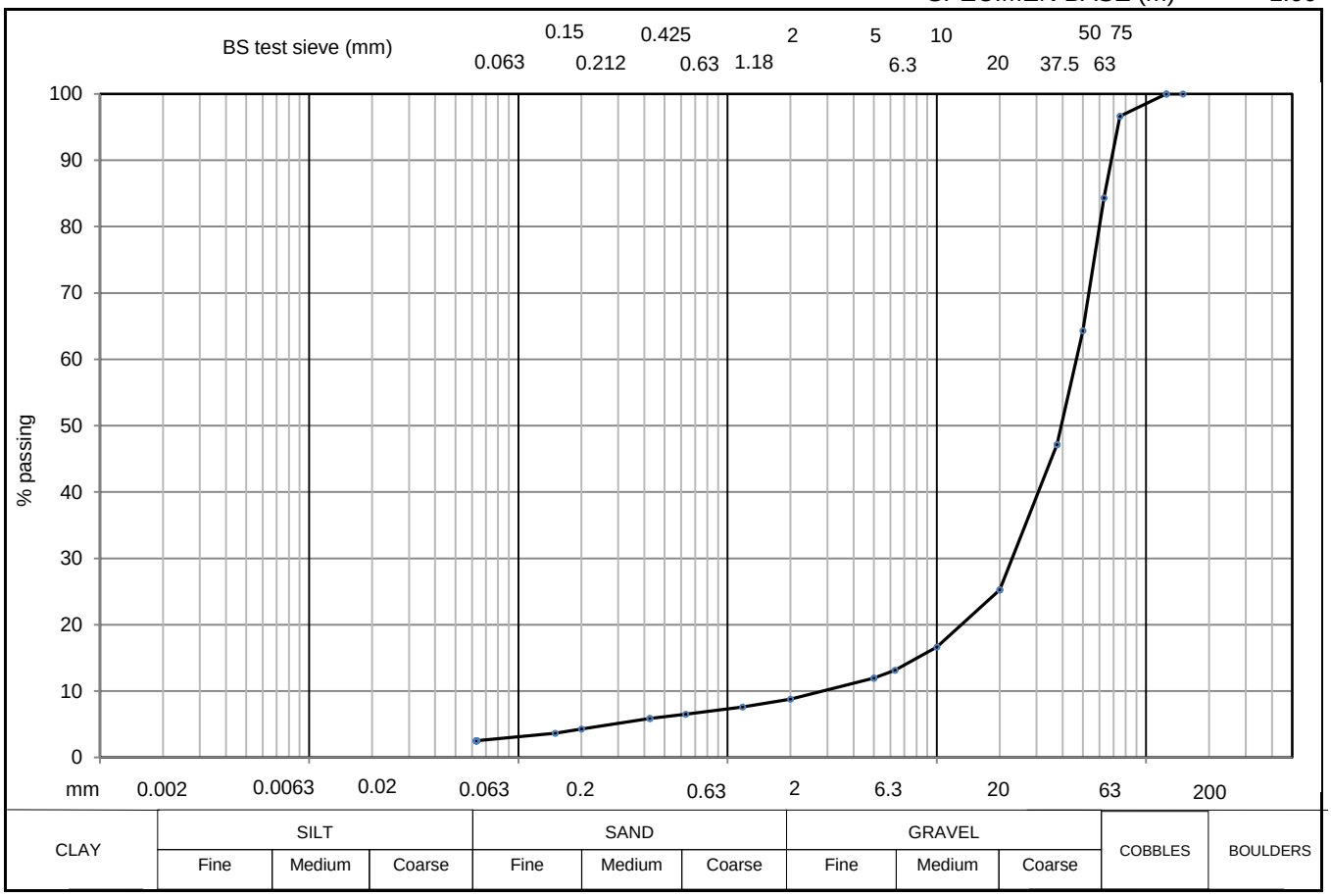
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH306
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	0.90
DESCRIPTION	Brown slightly silty sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.90
		SPECIMEN BASE (m)	1.00



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	6
GRAVEL	76
COBBLE & BOULDER	16
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	12	20	
75	97	2	9	6	
63	84	1.18	8	2	
50	64	0.63	7		
37.5	47	0.425	6		
20	25	0.2	4		
10	17	0.15	4		
6.3	13	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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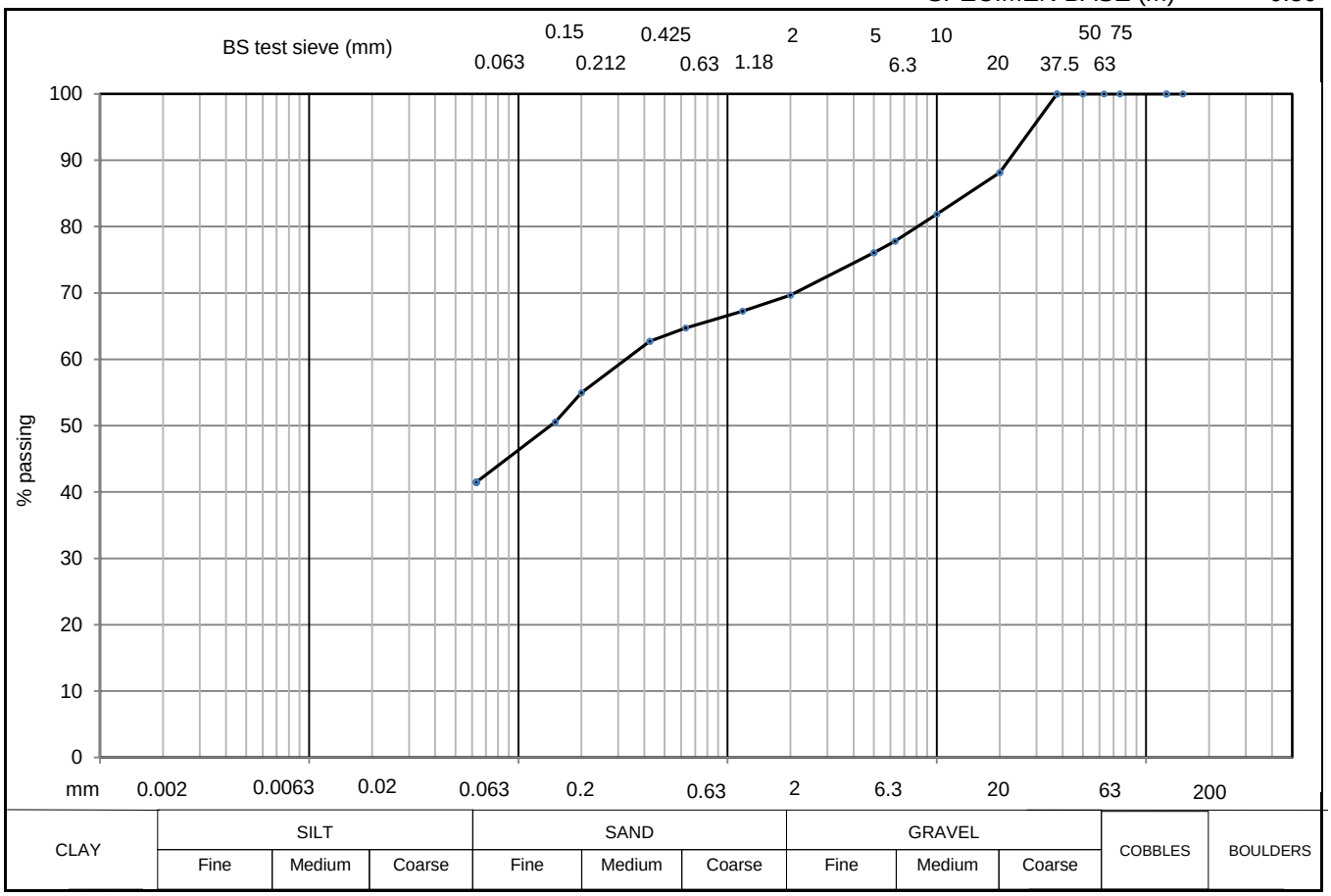
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	BH307
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	0.30
DESCRIPTION	Brown slightly sandy slightly gravelly CLAY	SPECIMEN TOP (m)	0.30
		SPECIMEN BASE (m)	0.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	41
SAND	28
GRAVEL	30
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	76	20	
75		2	70	6	
63		1.18	67	2	
50		0.63	65		
37.5	100	0.425	63		
20	88	0.2	55		
10	82	0.15	51		
6.3	78	0.063	41		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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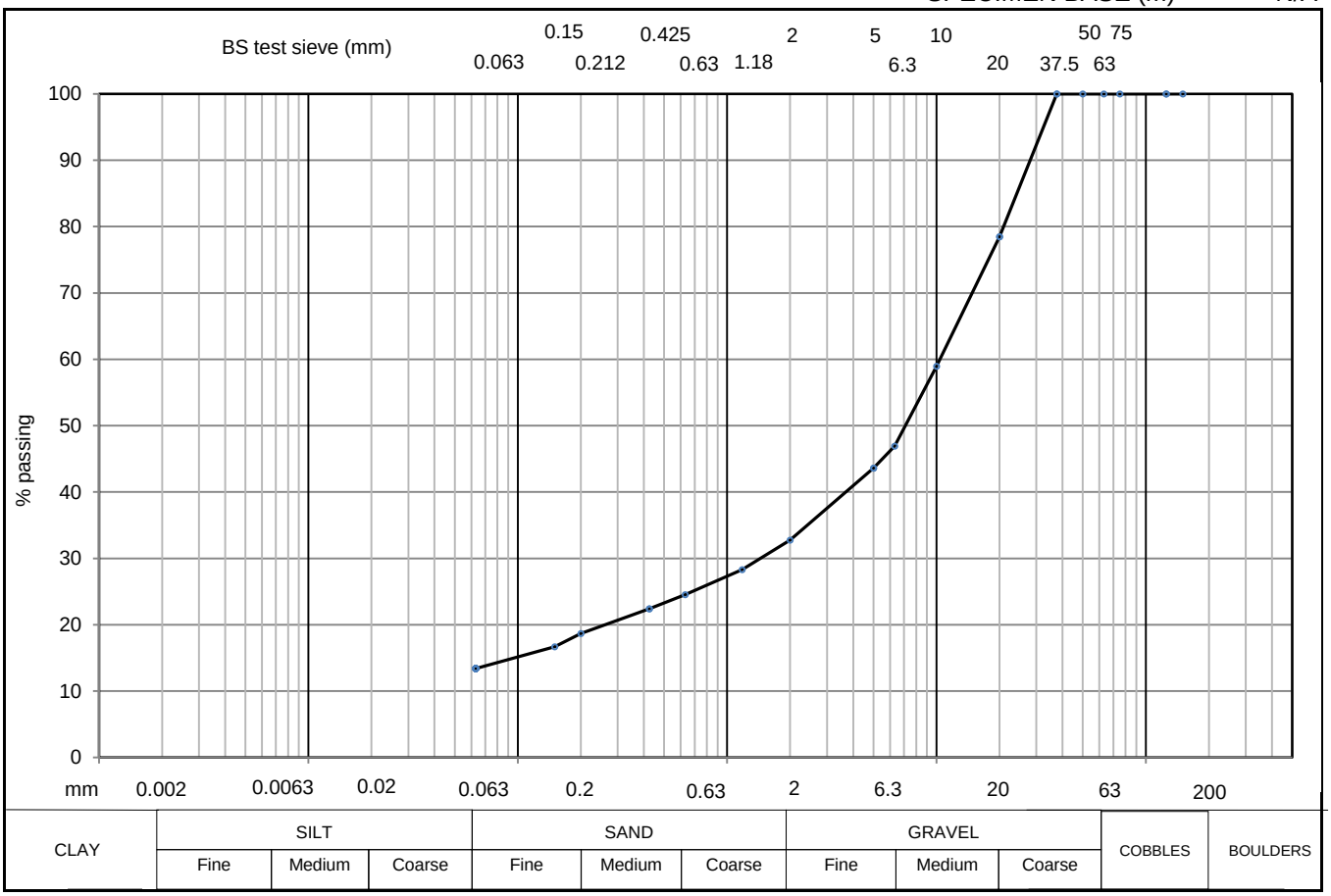
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP101
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown silty sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	13
SAND	19
GRAVEL	67
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	100
20	78
10	59
6.3	47

BS test sieve (mm)	% passing
5	44
2	33
1.18	28
0.63	25
0.425	22
0.2	19
0.15	17
0.063	13

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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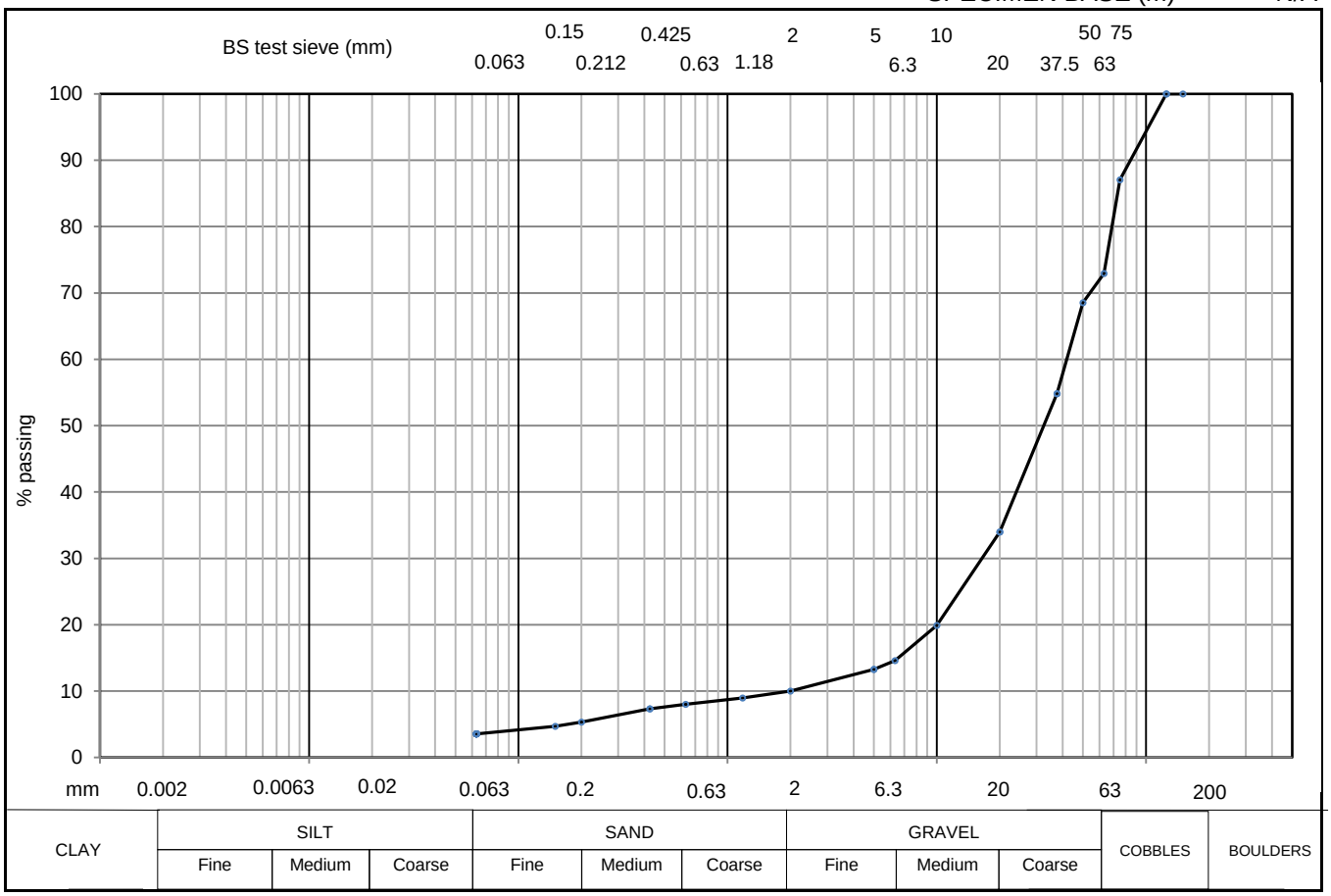
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP102
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown slightly clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	4
SAND	6
GRAVEL	63
COBBLE & BOULDER	27
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	13	20	
75	87	2	10	6	
63	73	1.18	9	2	
50	69	0.63	8		
37.5	55	0.425	7		
20	34	0.2	5		
10	20	0.15	5		
6.3	15	0.063	4		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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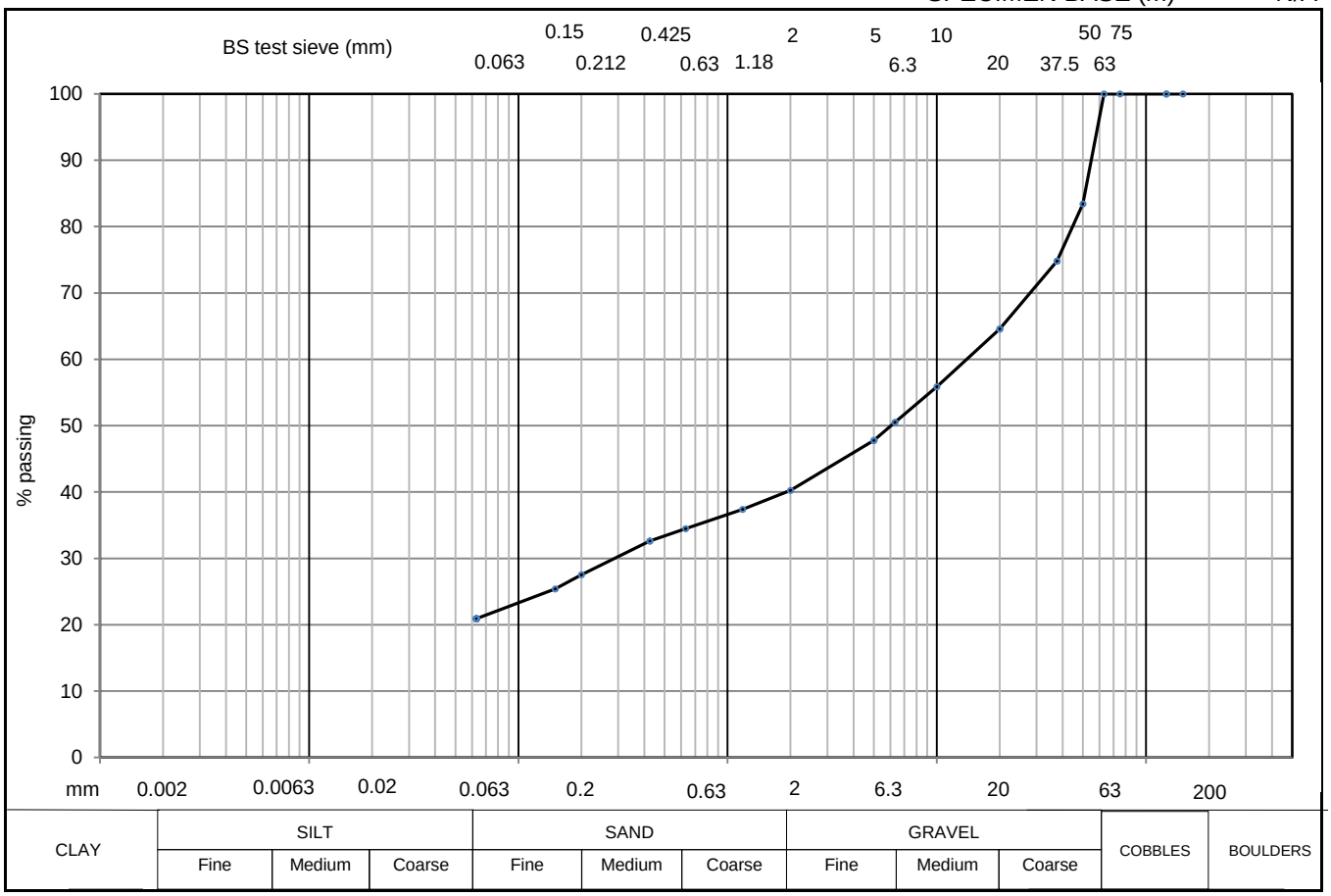
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP107
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown sandy very clayey GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	21
SAND	19
GRAVEL	60
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	48	20	
75		2	40	6	
63	100	1.18	37	2	
50	83	0.63	34		
37.5	75	0.425	33		
20	65	0.2	28		
10	56	0.15	25		
6.3	50	0.063	21		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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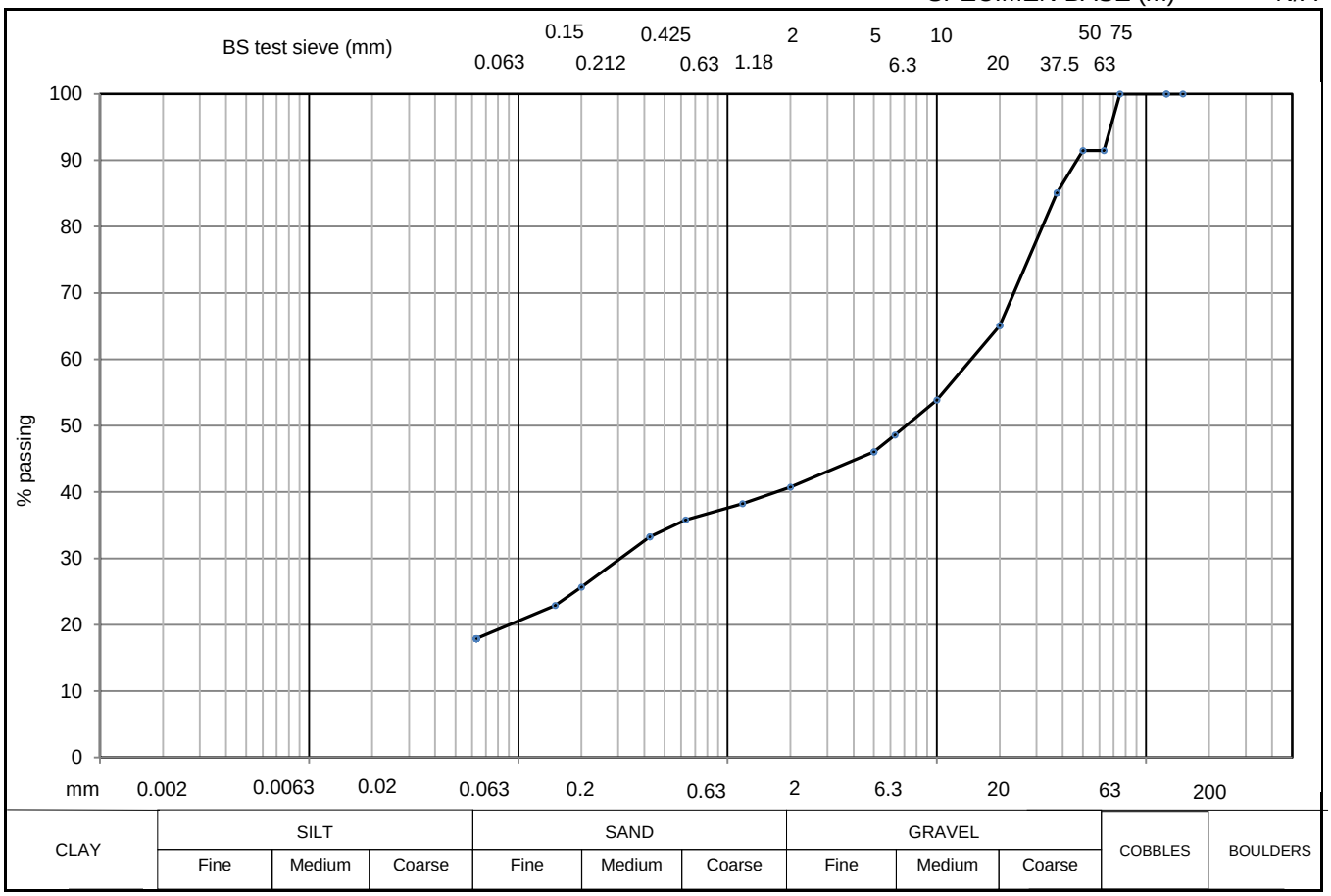
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP201
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey very sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	23
GRAVEL	51
COBBLE & BOULDER	9
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	46	20	
75	100	2	41	6	
63	91	1.18	38	2	
50	91	0.63	36		
37.5	85	0.425	33		
20	65	0.2	26		
10	54	0.15	23		
6.3	49	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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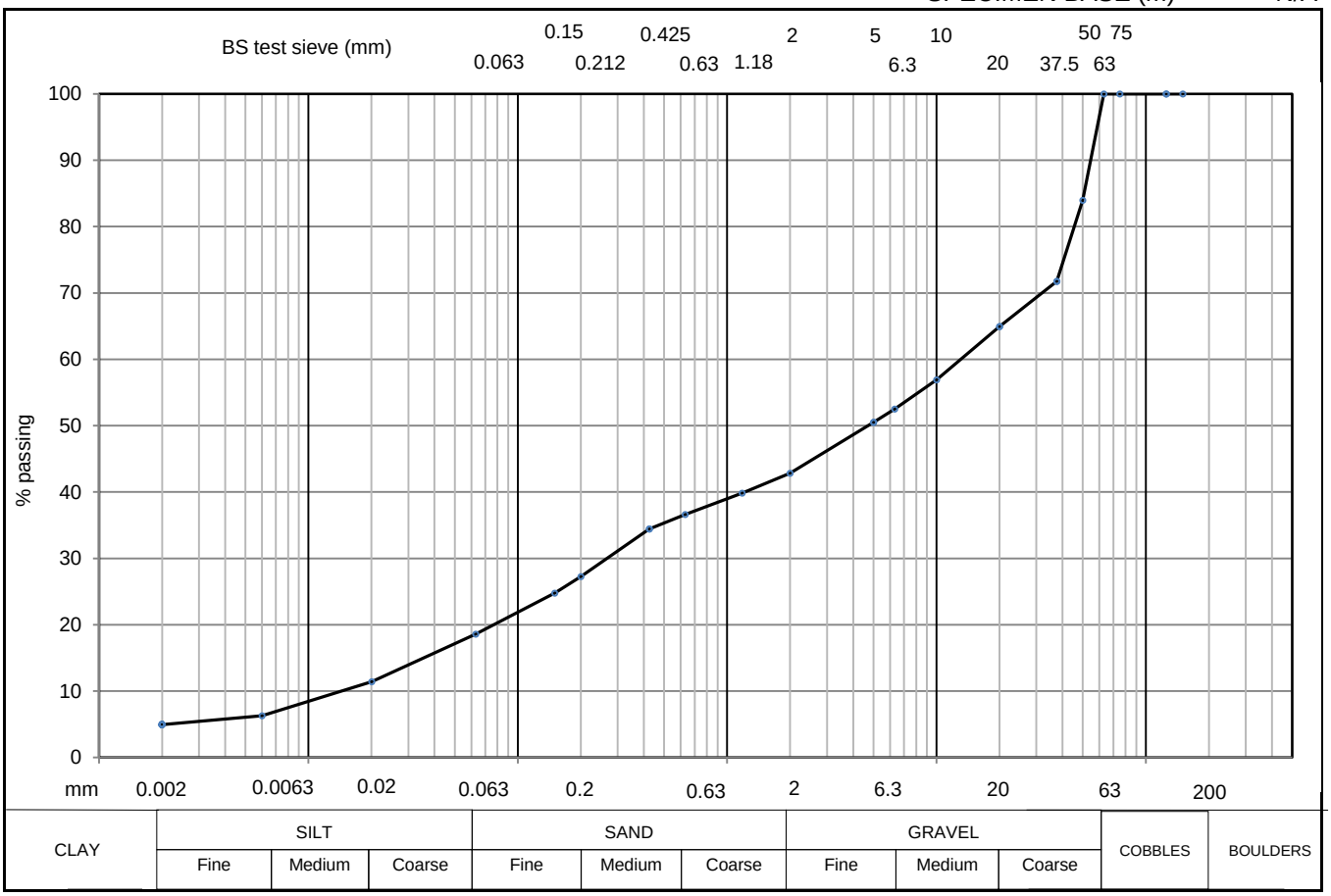
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP201
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	5B
		SAMPLE DEPTH (m)	2.50
DESCRIPTION	Brown silty very sandy GRAVEL	SPECIMEN TOP (m)	2.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	5
SILT	14
SILT & CLAY	19
SAND	24
GRAVEL	57
COBBLE & BOULDER	0
test method(s)	5.2 & 5.4
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	51	20	11
75		2	43	6	6
63	100	1.18	40	2	5
50	84	0.63	37		
37.5	72	0.425	34		
20	65	0.2	27		
10	57	0.15	25		
6.3	53	0.063	19		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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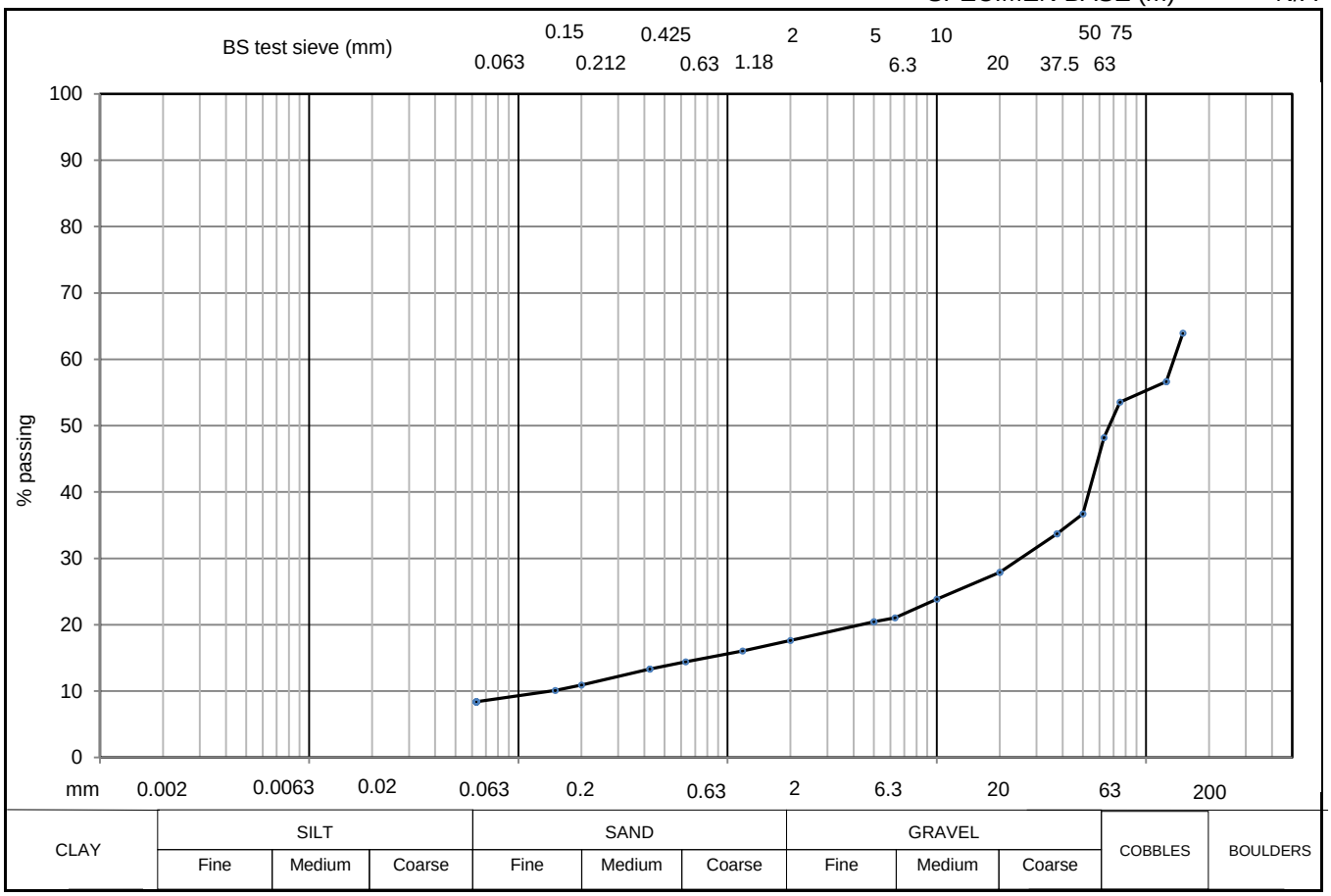
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP202
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	8
SAND	9
GRAVEL	31
COBBLE & BOULDER	52
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	64	5	20	20	
75	54	2	18	6	
63	48	1.18	16	2	
50	37	0.63	14		
37.5	34	0.425	13		
20	28	0.2	11		
10	24	0.15	10		
6.3	21	0.063	8		

remarks

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Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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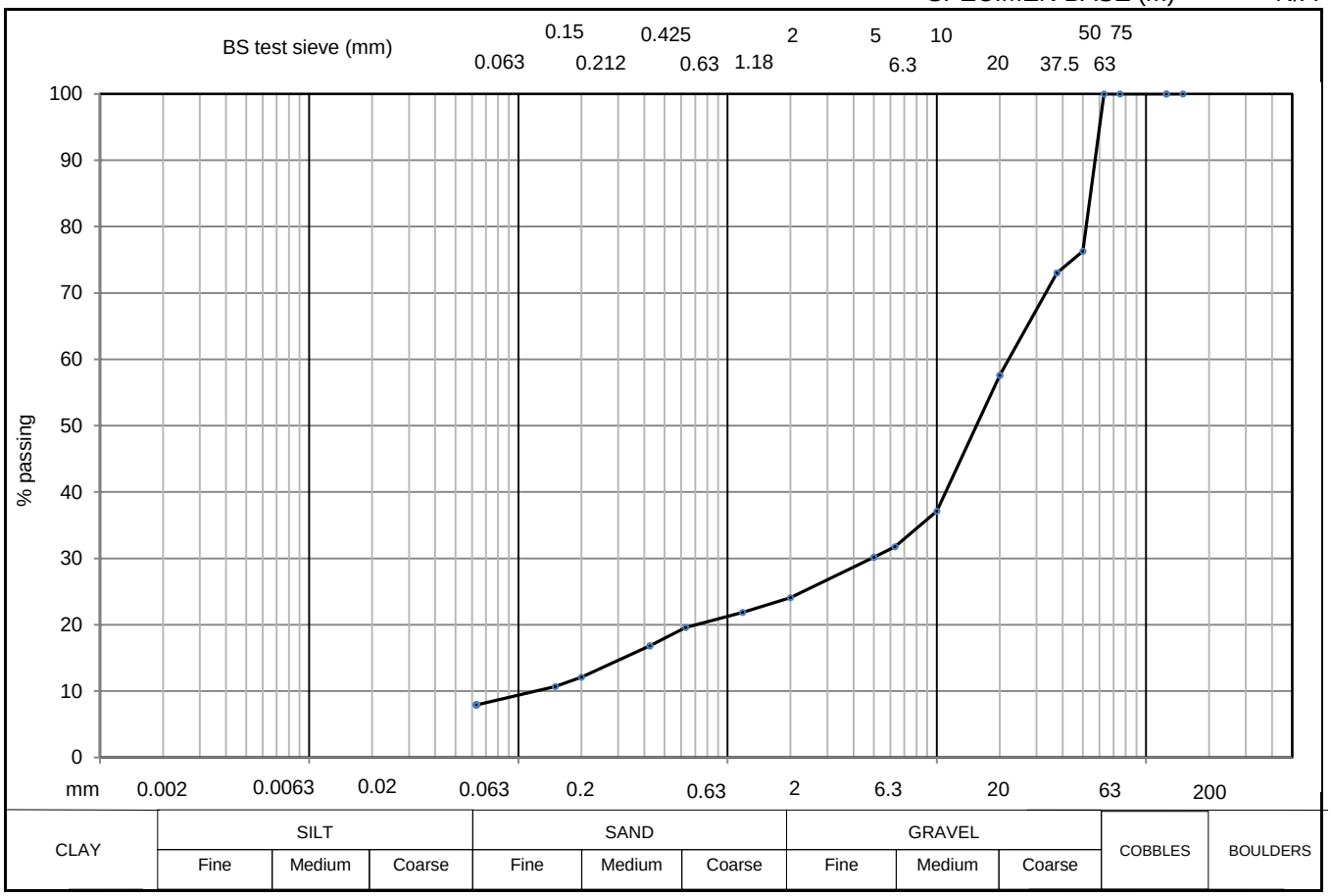
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP204
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	8
SAND	16
GRAVEL	76
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	30	20	
75		2	24	6	
63	100	1.18	22	2	
50	76	0.63	20		
37.5	73	0.425	17		
20	58	0.2	12		
10	37	0.15	11		
6.3	32	0.063	8		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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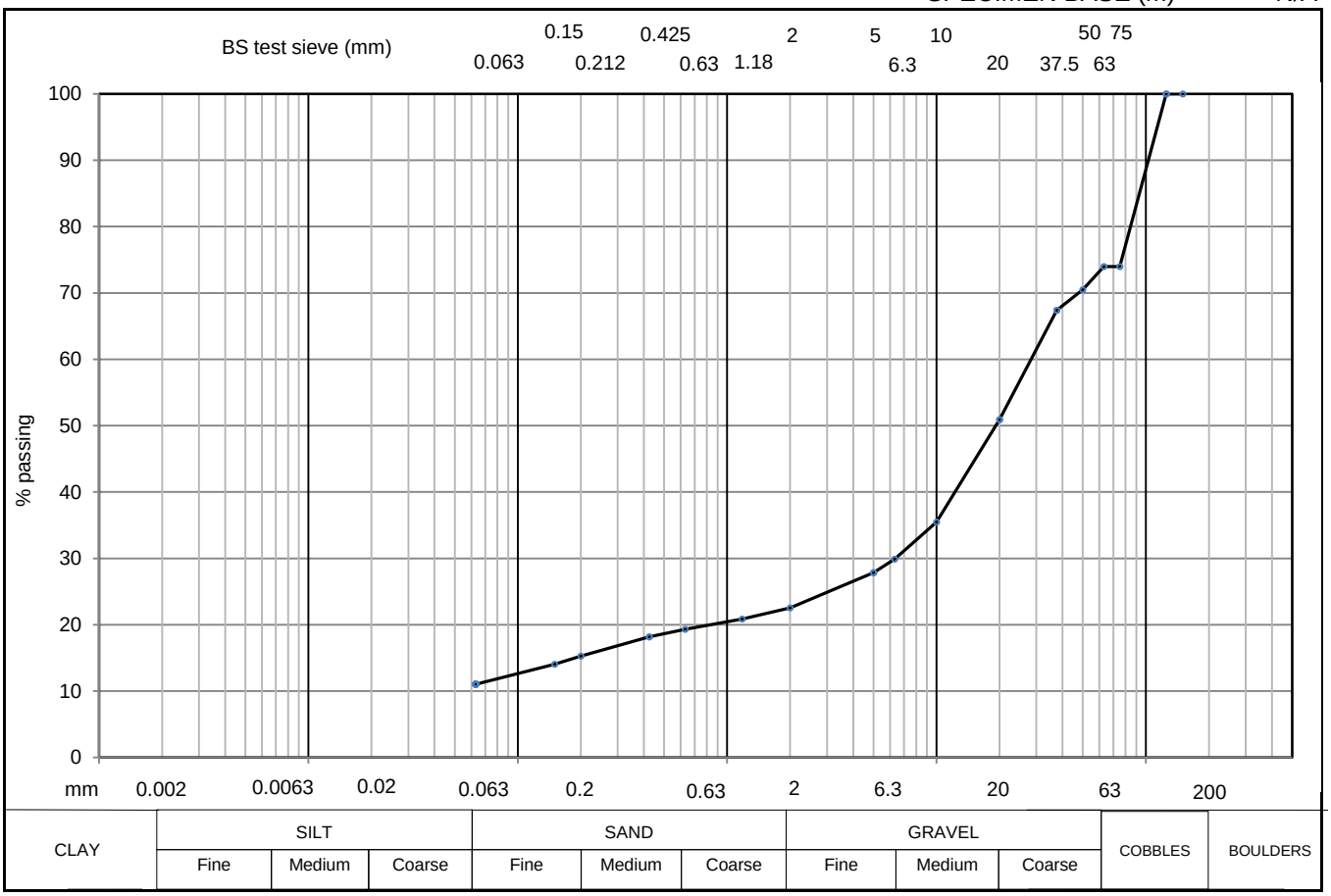
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP204
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	11
SAND	12
GRAVEL	51
COBBLE & BOULDER	26
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	28	20	
75	74	2	23	6	
63	74	1.18	21	2	
50	70	0.63	19		
37.5	67	0.425	18		
20	51	0.2	15		
10	35	0.15	14		
6.3	30	0.063	11		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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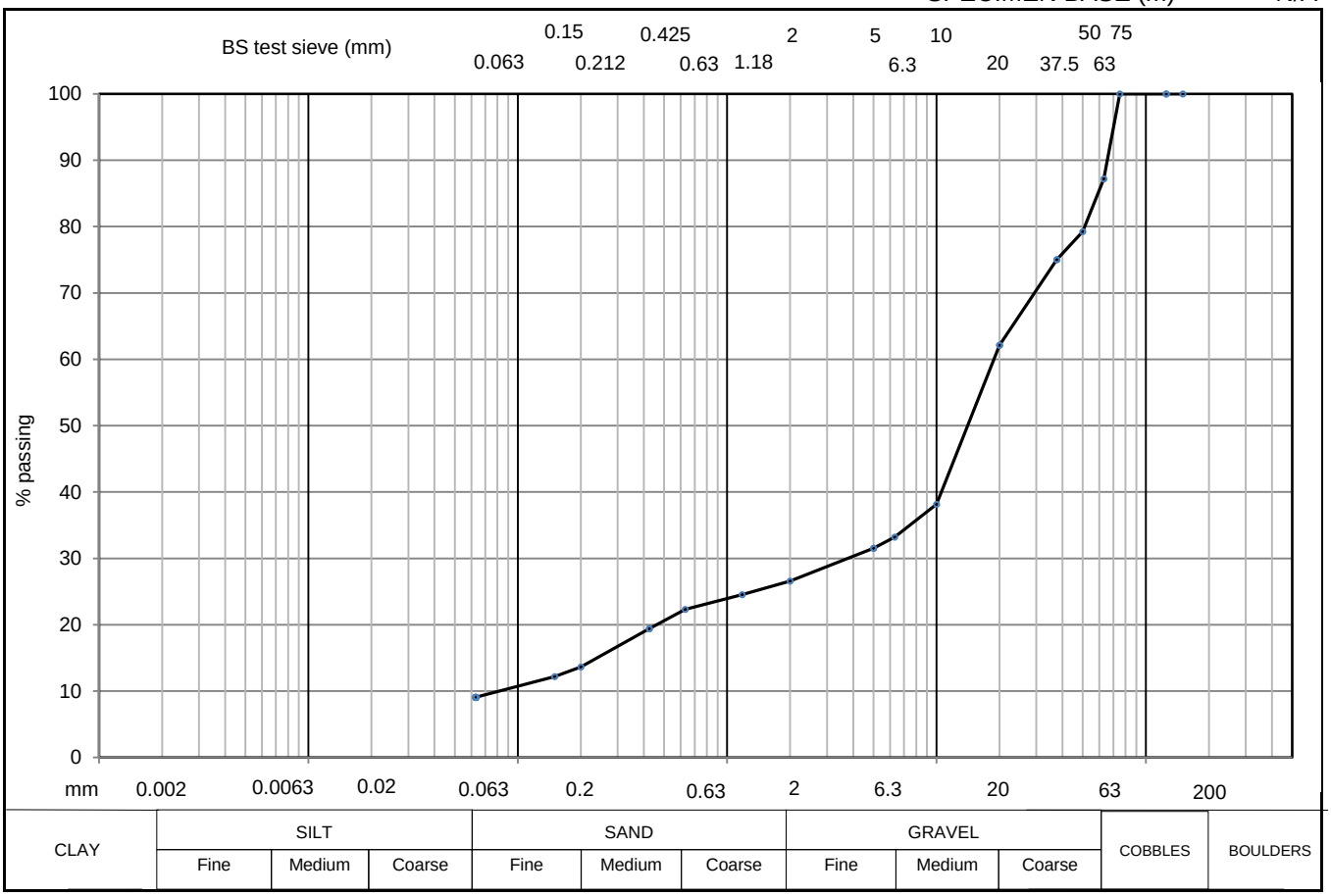
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP205
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	9
SAND	17
GRAVEL	61
COBBLE & BOULDER	13
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	32	20	
75	100	2	27	6	
63	87	1.18	25	2	
50	79	0.63	22		
37.5	75	0.425	19		
20	62	0.2	14		
10	38	0.15	12		
6.3	33	0.063	9		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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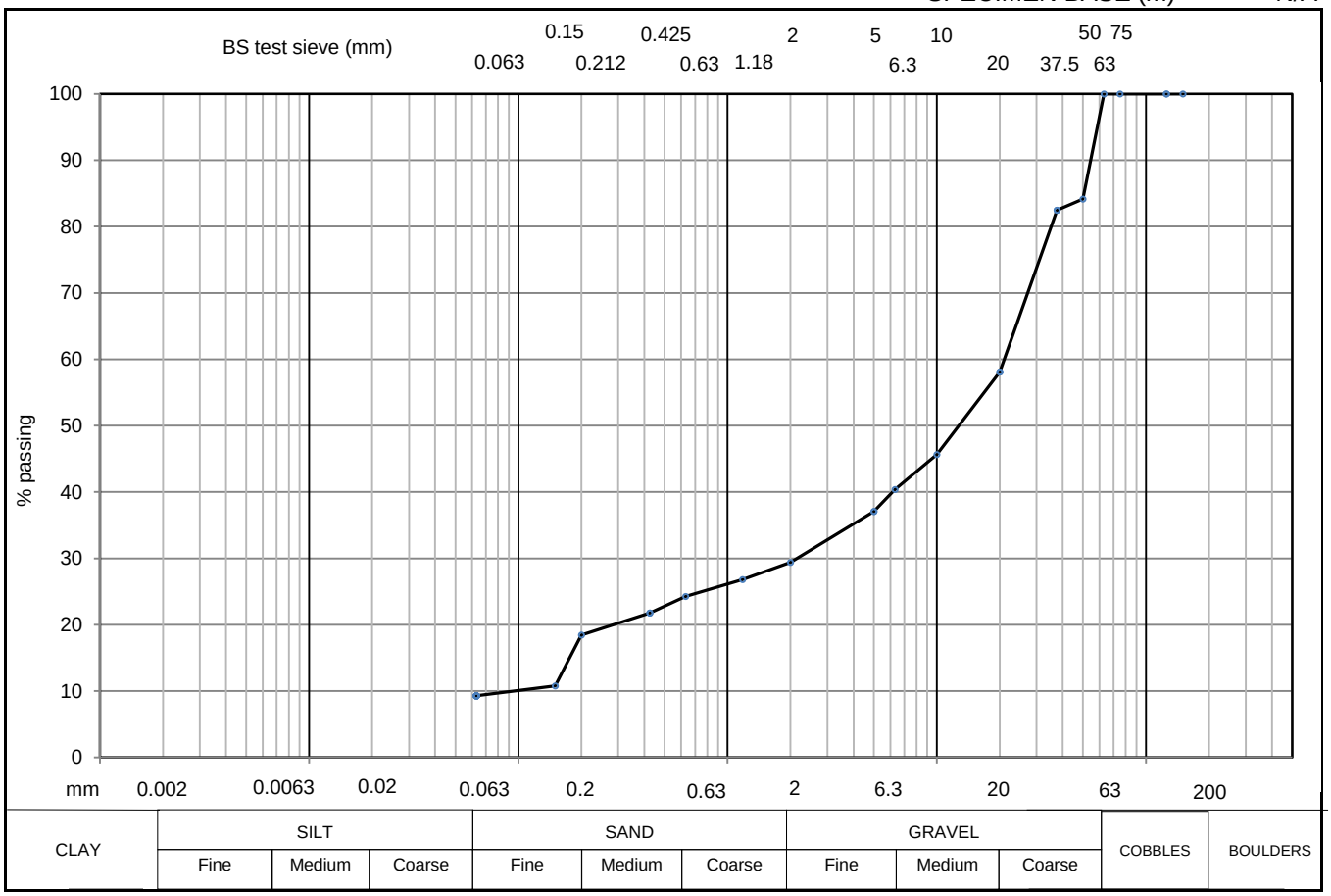
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP206A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	9
SAND	20
GRAVEL	71
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	84
37.5	82
20	58
10	46
6.3	40

BS test sieve (mm)	% passing
5	37
2	29
1.18	27
0.63	24
0.425	22
0.2	18
0.15	11
0.063	9

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

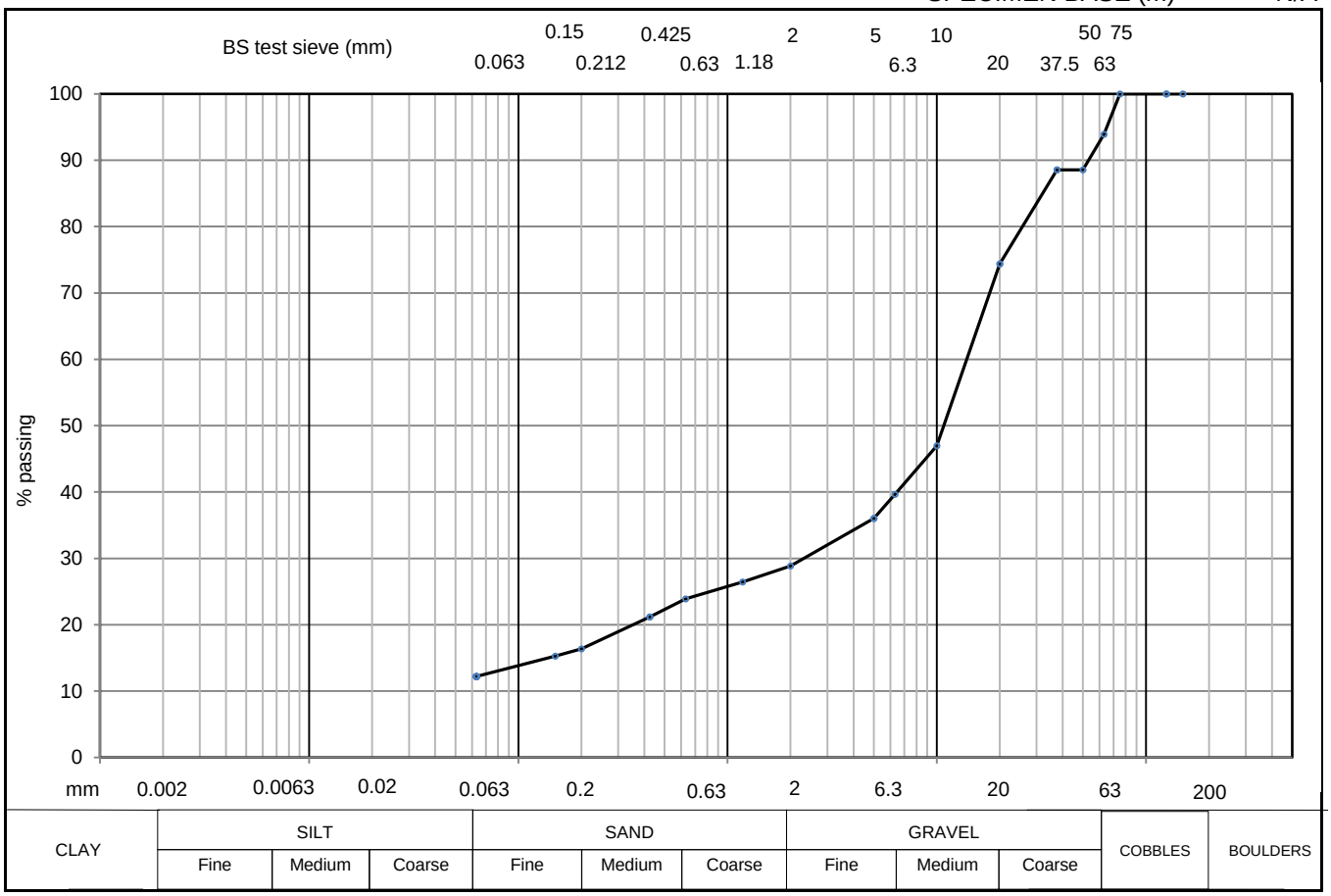
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP207A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	12
SAND	17
GRAVEL	65
COBBLE & BOULDER	6
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	36	20	
75	100	2	29	6	
63	94	1.18	26	2	
50	89	0.63	24		
37.5	89	0.425	21		
20	74	0.2	16		
10	47	0.15	15		
6.3	40	0.063	12		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

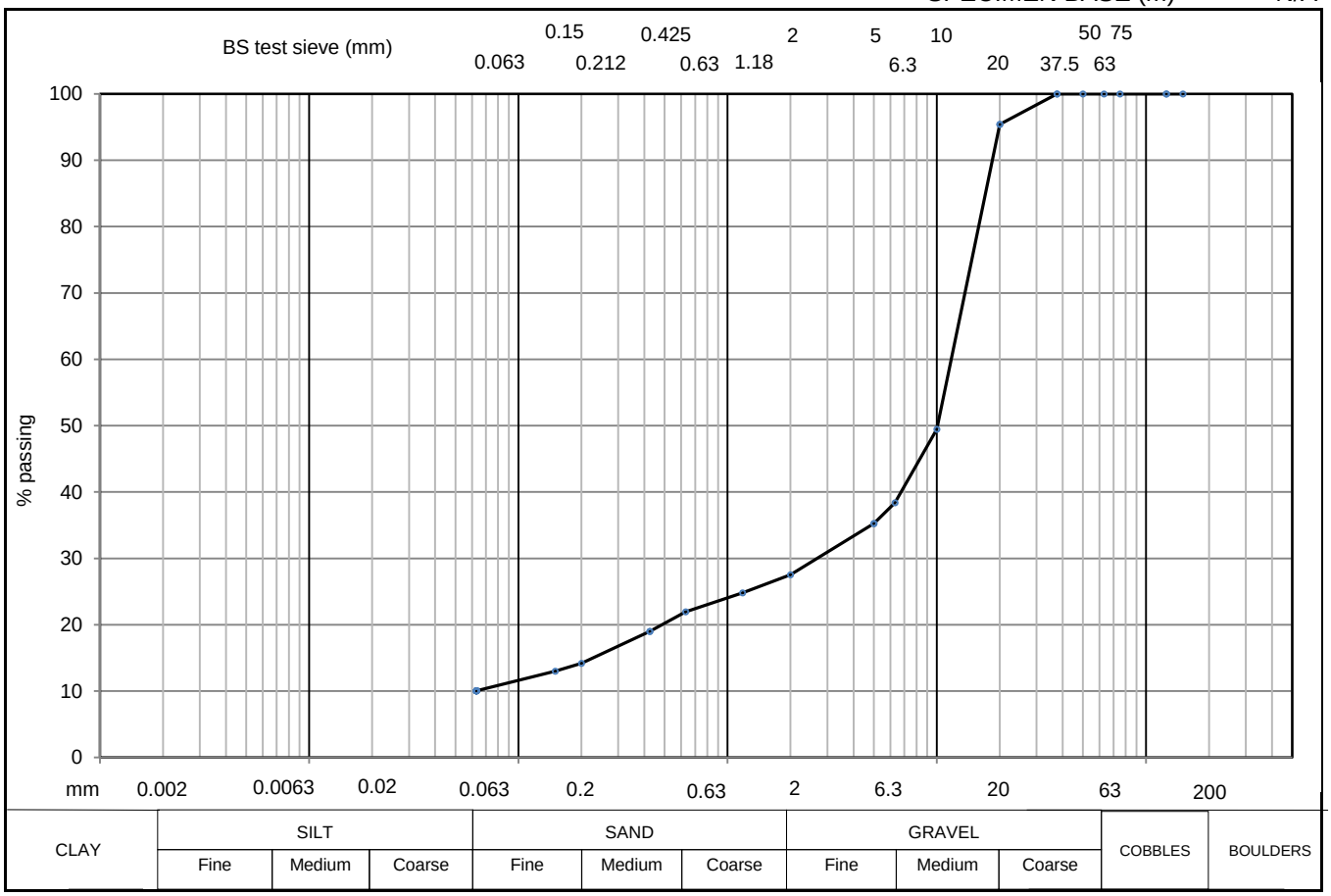
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP207A
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	10
SAND	17
GRAVEL	72
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	
50	
37.5	100
20	95
10	49
6.3	38

BS test sieve (mm)	% passing
5	35
2	28
1.18	25
0.63	22
0.425	19
0.2	14
0.15	13
0.063	10

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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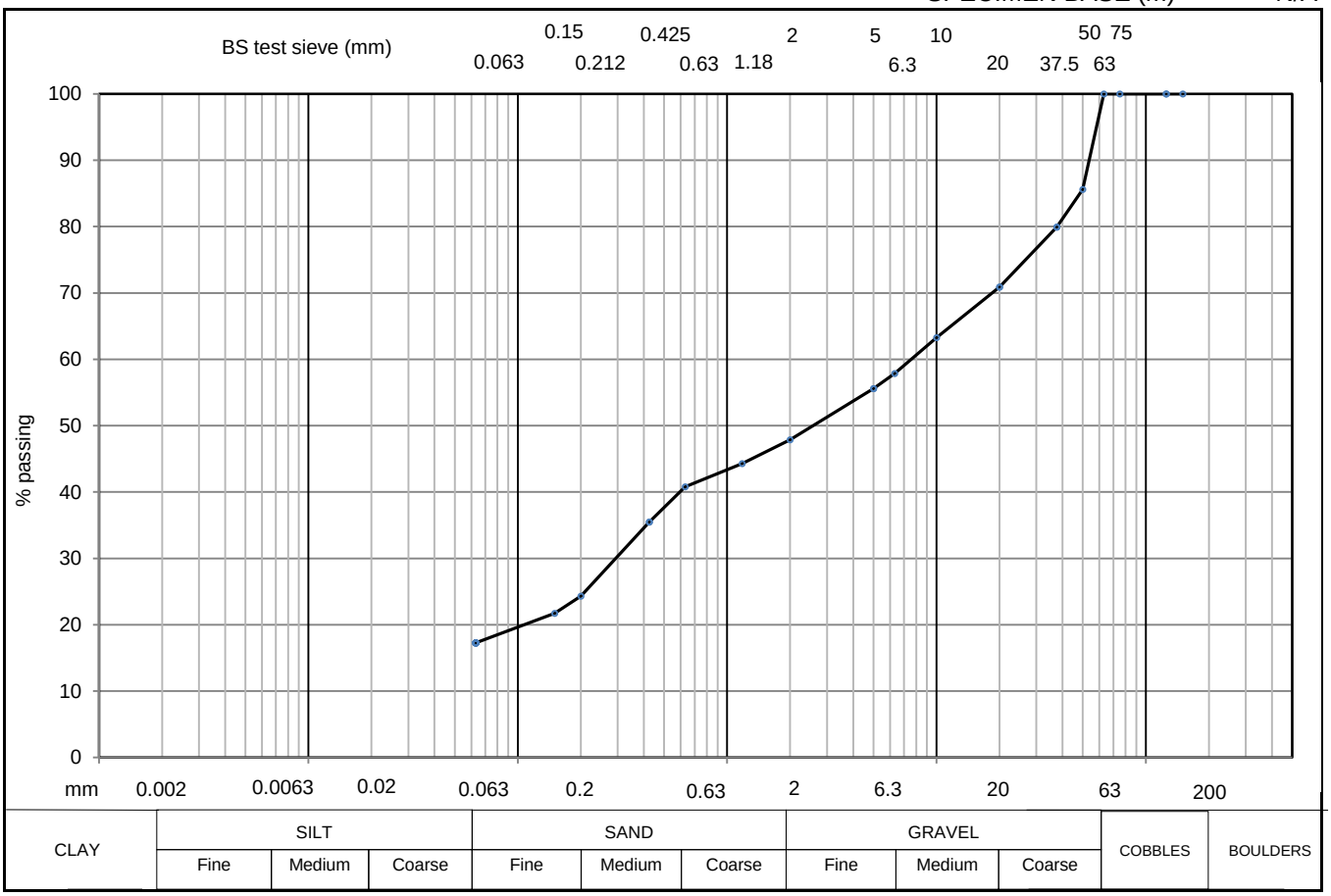
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP210
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3B
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	17
SAND	31
GRAVEL	52
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	86
37.5	80
20	71
10	63
6.3	58

BS test sieve (mm)	% passing
5	56
2	48
1.18	44
0.63	41
0.425	35
0.2	24
0.15	22
0.063	17

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

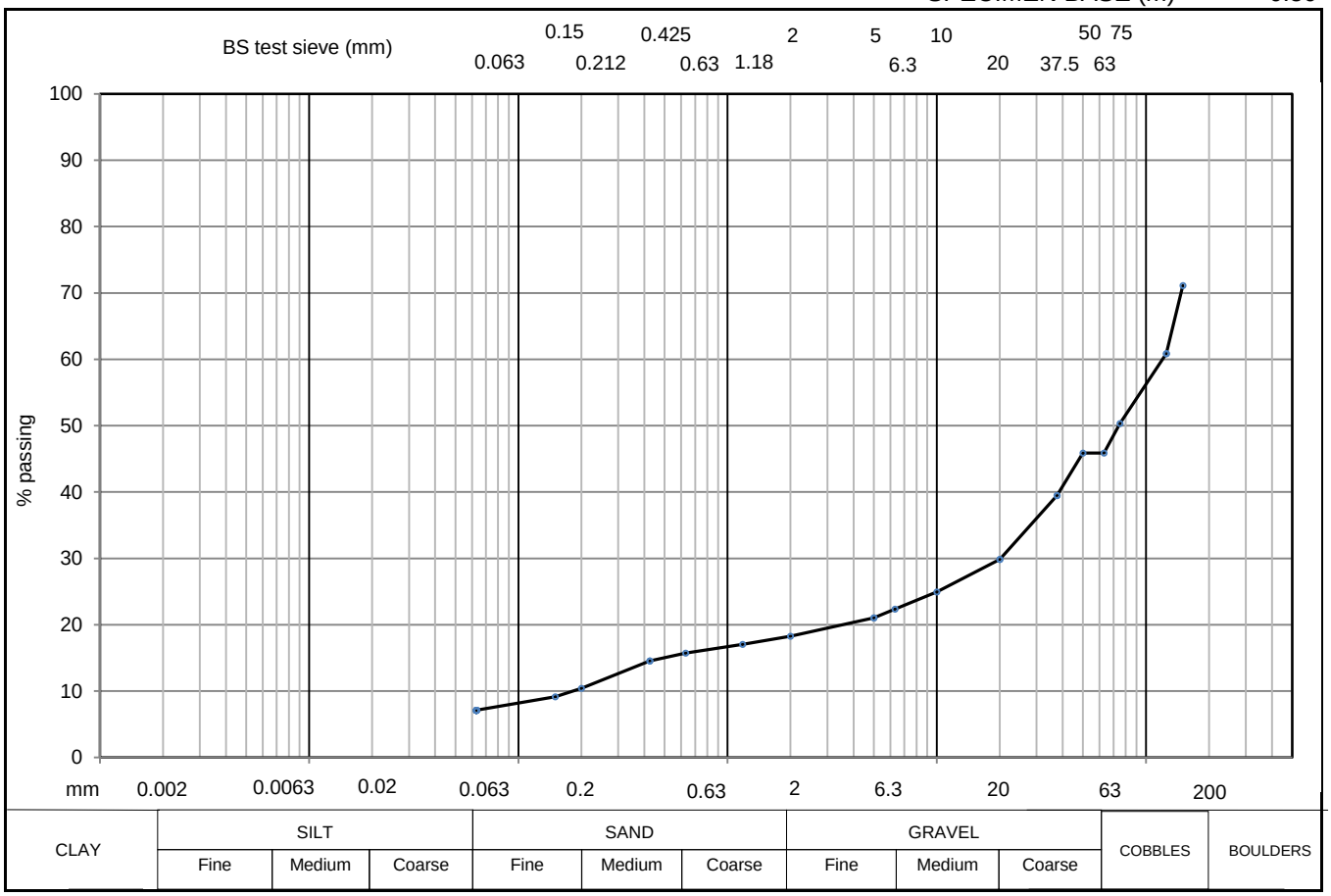
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP211
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	11
GRAVEL	28
COBBLE & BOULDER	54
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	71	5	21	20	
75	50	2	18	6	
63	46	1.18	17	2	
50	46	0.63	16		
37.5	39	0.425	15		
20	30	0.2	10		
10	25	0.15	9		
6.3	22	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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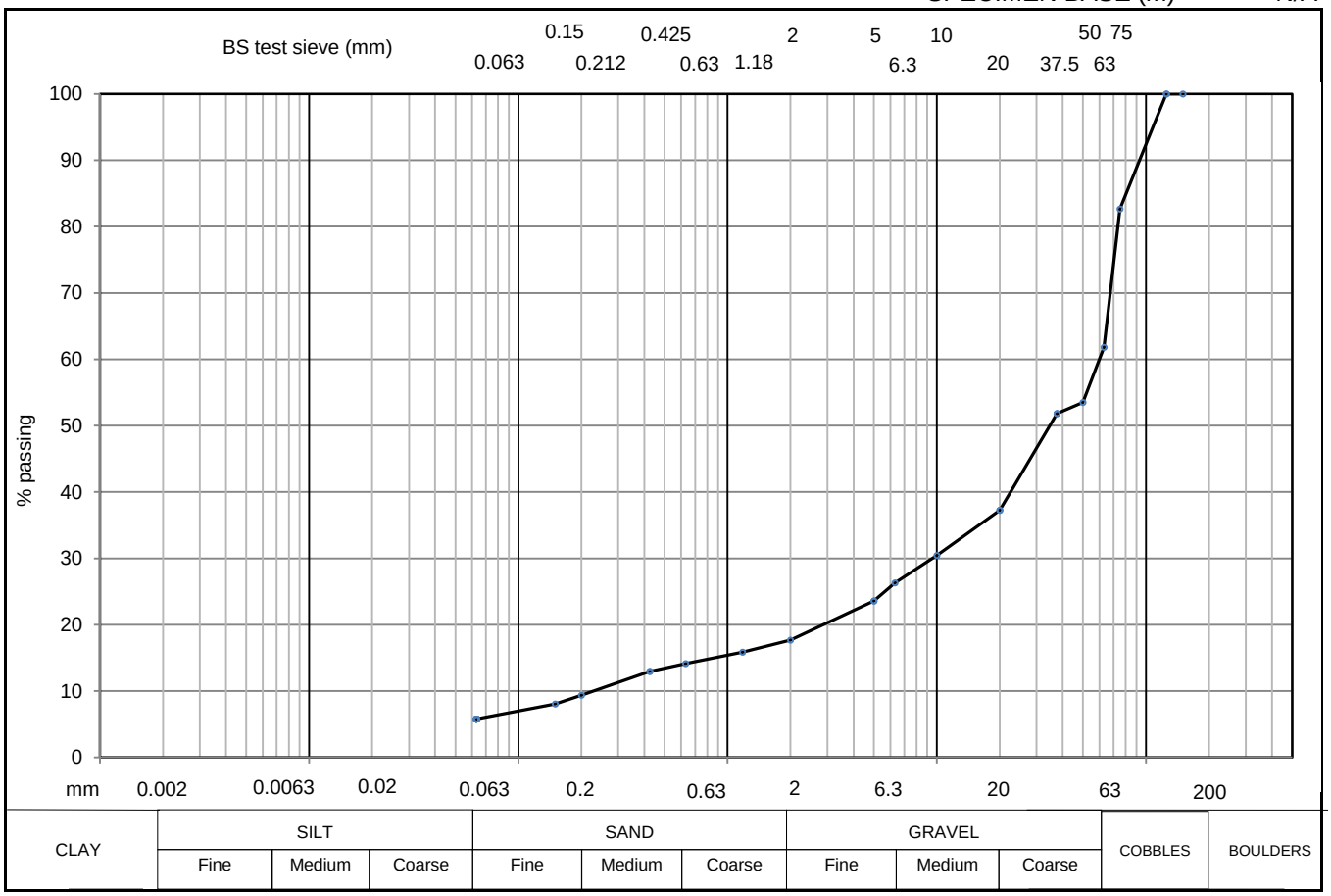
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP211
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	6
SAND	12
GRAVEL	44
COBBLE & BOULDER	38
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	24	20	
75	83	2	18	6	
63	62	1.18	16	2	
50	53	0.63	14		
37.5	52	0.425	13		
20	37	0.2	9		
10	30	0.15	8		
6.3	26	0.063	6		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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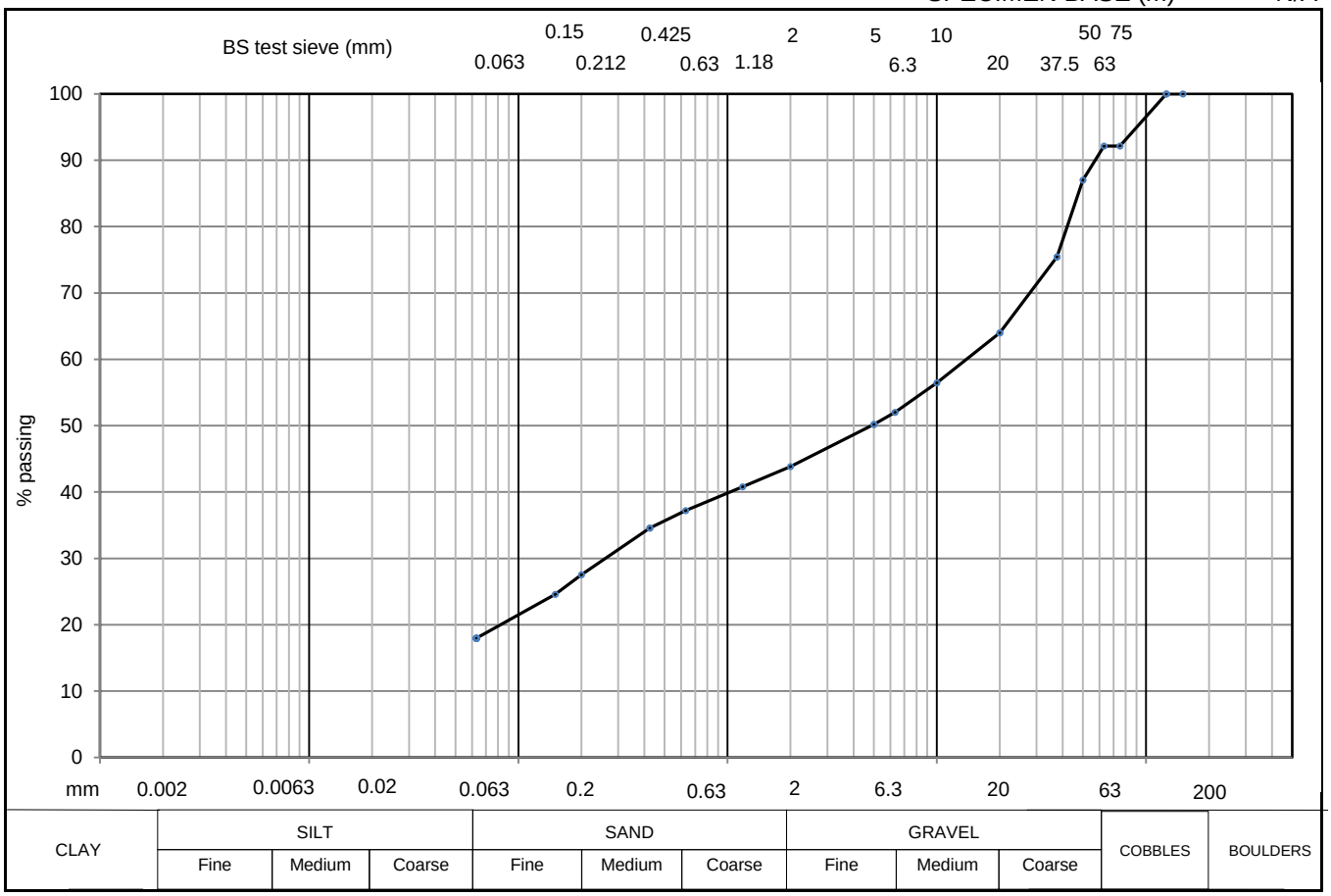
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown clayey very sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	26
GRAVEL	48
COBBLE & BOULDER	8
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	50	20	
75	92	2	44	6	
63	92	1.18	41	2	
50	87	0.63	37		
37.5	75	0.425	35		
20	64	0.2	28		
10	56	0.15	25		
6.3	52	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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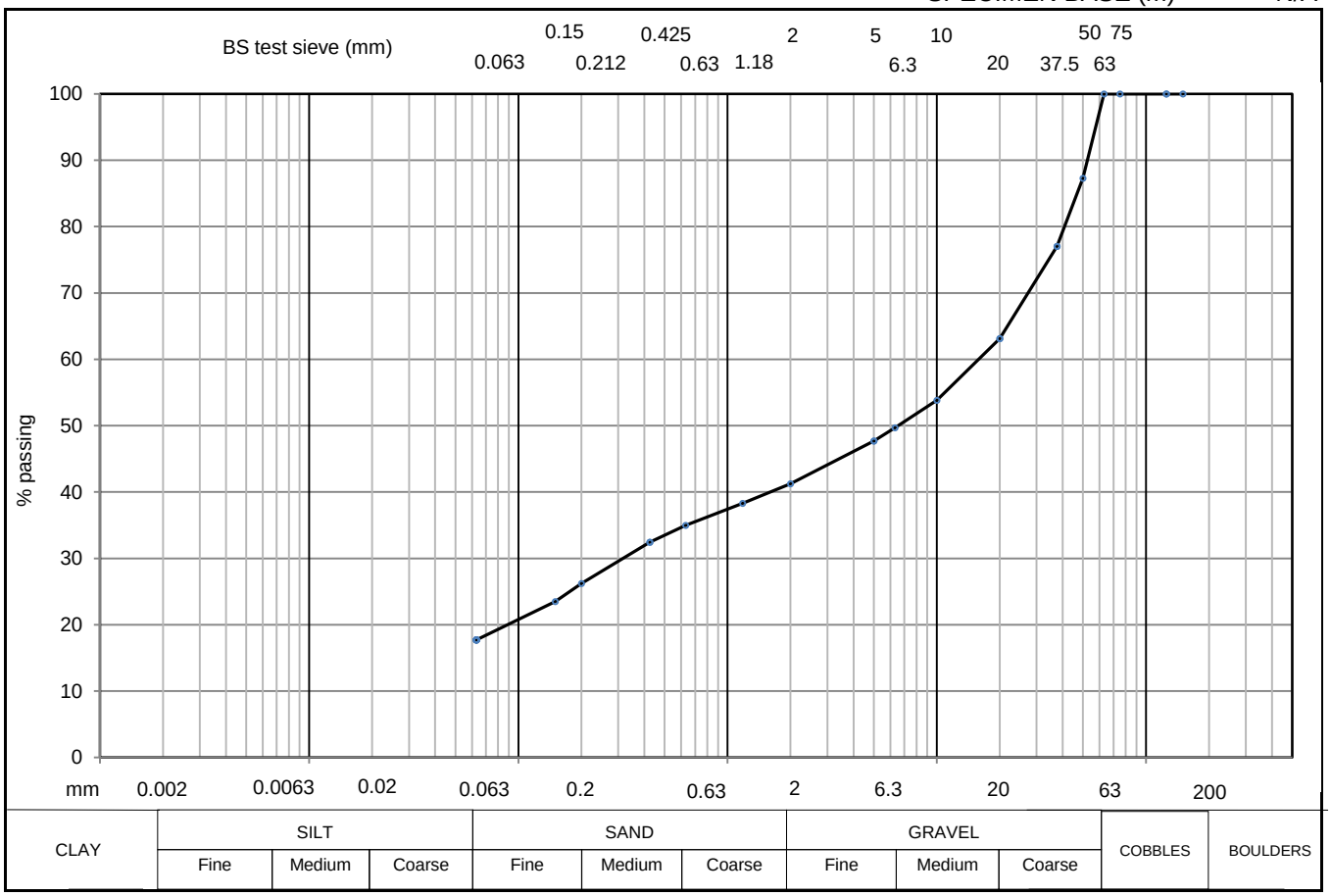
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3D
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	18
SAND	24
GRAVEL	59
COBBLE & BOULDER	0
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	48	20	
75		2	41	6	
63	100	1.18	38	2	
50	87	0.63	35		
37.5	77	0.425	32		
20	63	0.2	26		
10	54	0.15	23		
6.3	50	0.063	18		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

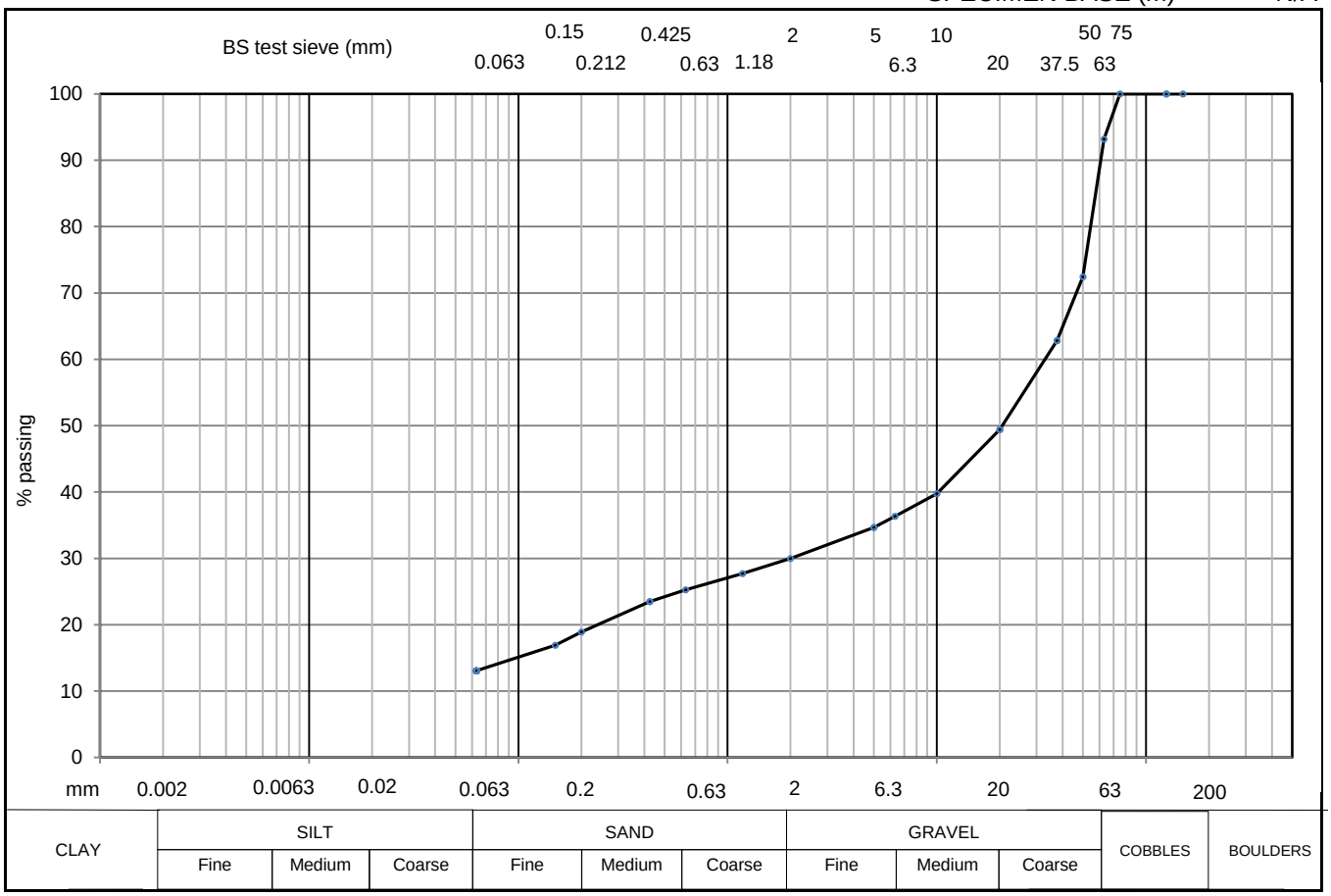
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP212
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4D
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	13
SAND	17
GRAVEL	63
COBBLE & BOULDER	7
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	35	20	
75	100	2	30	6	
63	93	1.18	28	2	
50	72	0.63	25		
37.5	63	0.425	23		
20	49	0.2	19		
10	40	0.15	17		
6.3	36	0.063	13		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

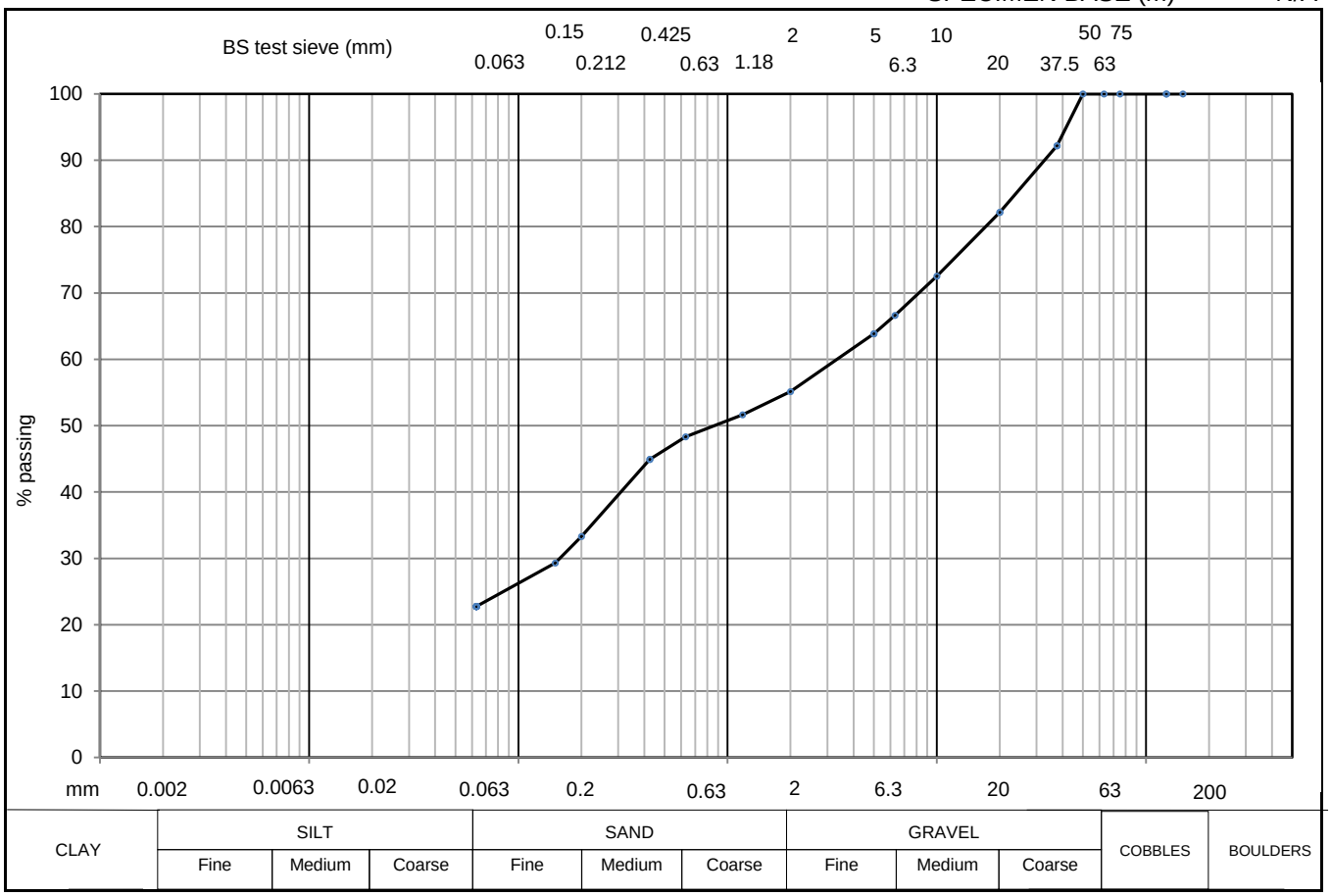
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP213
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown very clayey very sandy GRAVEL with rare rootets	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	32
GRAVEL	45
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	64	20	
75		2	55	6	
63		1.18	52	2	
50	100	0.63	48		
37.5	92	0.425	45		
20	82	0.2	33		
10	73	0.15	29		
6.3	67	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

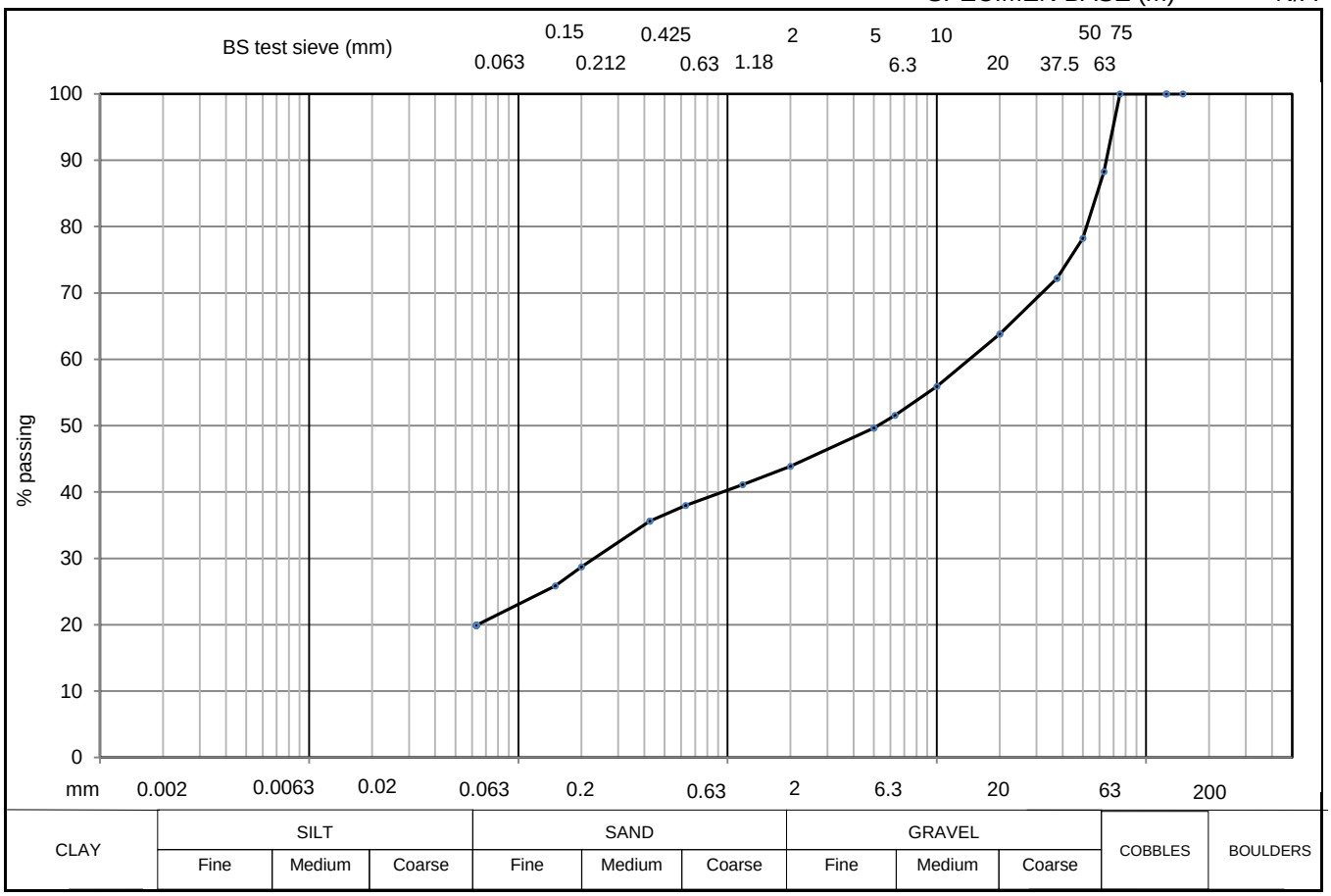
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP214
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey very sandy GRAVEL with meduim cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	20
SAND	24
GRAVEL	44
COBBLE & BOULDER	12
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	50	20	
75	100	2	44	6	
63	88	1.18	41	2	
50	78	0.63	38		
37.5	72	0.425	36		
20	64	0.2	29		
10	56	0.15	26		
6.3	52	0.063	20		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

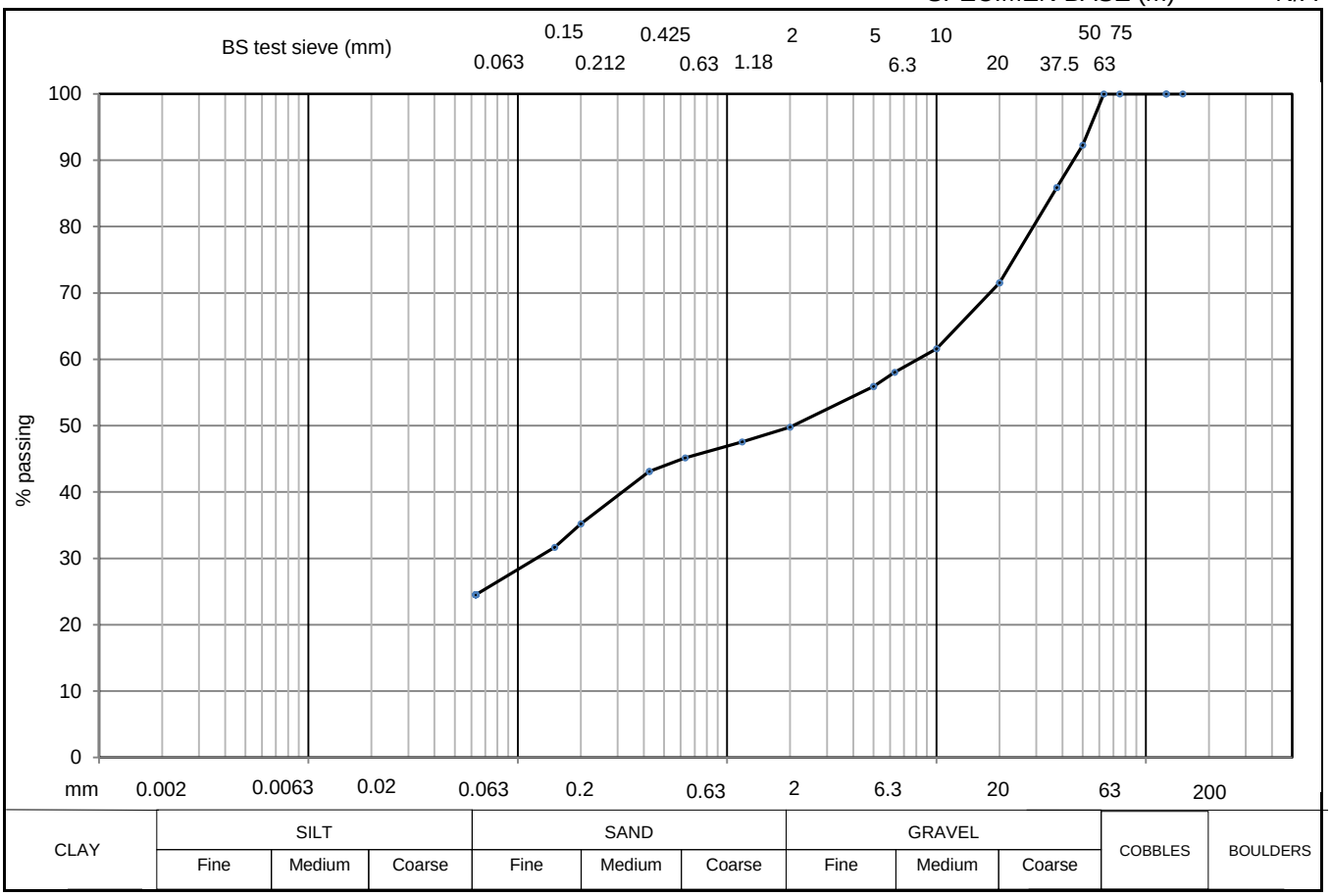
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP214
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown very clayey very sandy GRAVEL	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	25
SAND	25
GRAVEL	50
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	92
37.5	86
20	72
10	62
6.3	58

BS test sieve (mm)	% passing
5	56
2	50
1.18	48
0.63	45
0.425	43
0.2	35
0.15	32
0.063	25

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

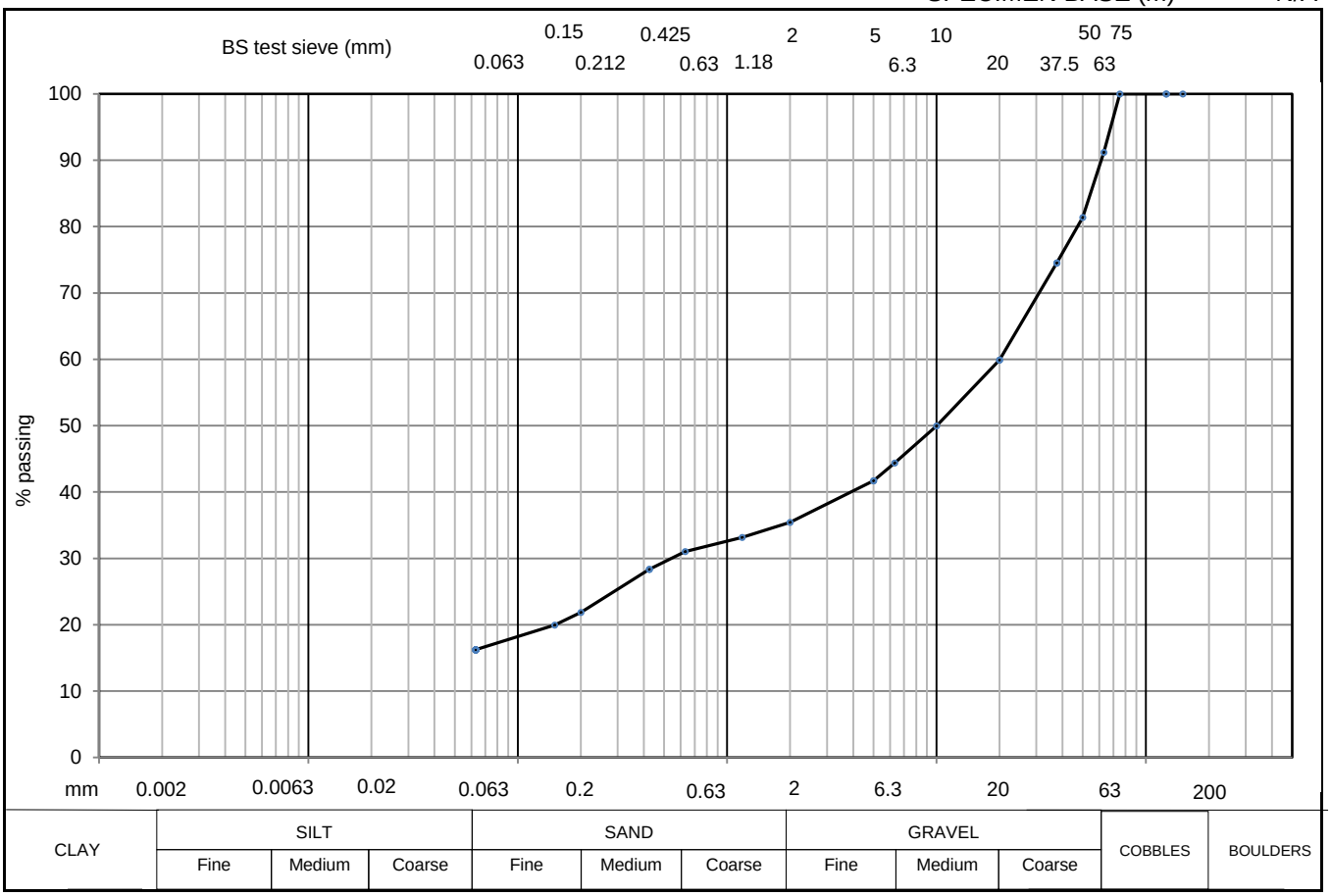
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP216
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown clayey sandy GRAVEL with medium cobble content	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	16
SAND	19
GRAVEL	56
COBBLE & BOULDER	9
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	42	20	
75	100	2	35	6	
63	91	1.18	33	2	
50	81	0.63	31		
37.5	75	0.425	28		
20	60	0.2	22		
10	50	0.15	20		
6.3	44	0.063	16		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

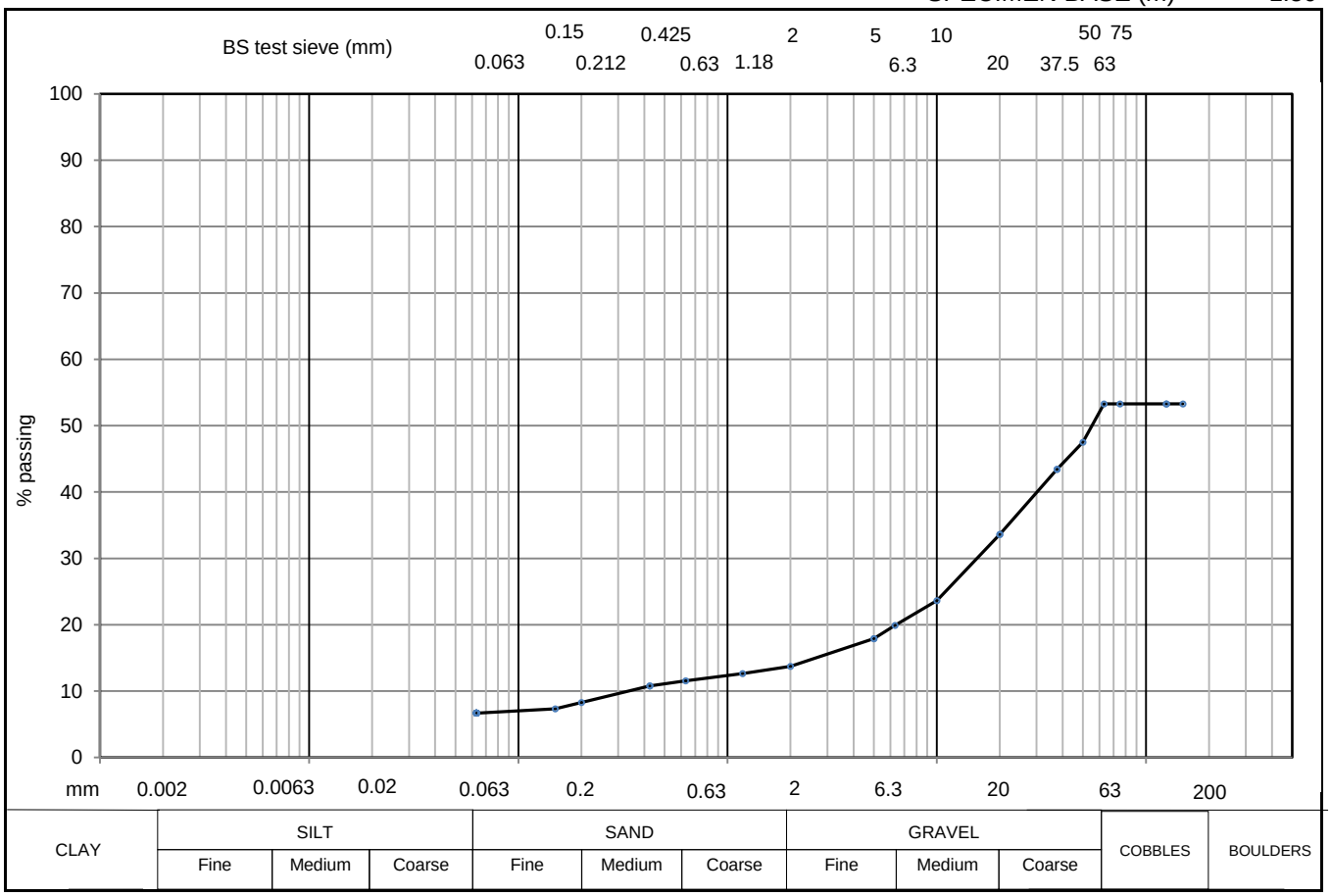
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP216
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	3D
		SAMPLE DEPTH (m)	1.50
DESCRIPTION	Brown clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.50
		SPECIMEN BASE (m)	1.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	7
GRAVEL	40
COBBLE & BOULDER	47
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	53	5	18	20	
75	53	2	14	6	
63	53	1.18	13	2	
50	48	0.63	12		
37.5	43	0.425	11		
20	34	0.2	8		
10	24	0.15	7		
6.3	20	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

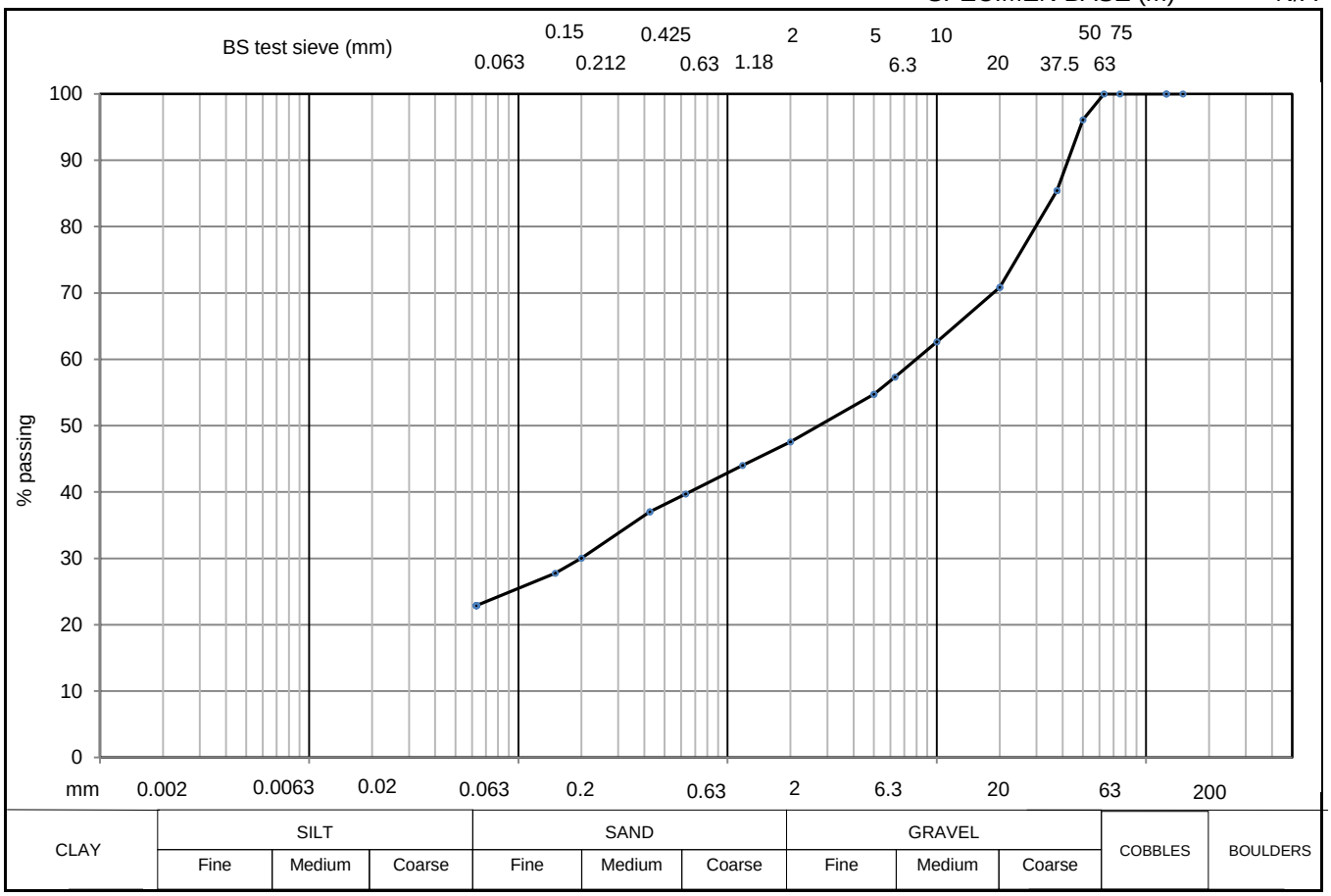
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP217
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown very clayey very sandy GRAVEL	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	23
SAND	25
GRAVEL	52
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150		5	55	20	
75		2	48	6	
63	100	1.18	44	2	
50	96	0.63	40		
37.5	85	0.425	37		
20	71	0.2	30		
10	63	0.15	28		
6.3	57	0.063	23		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

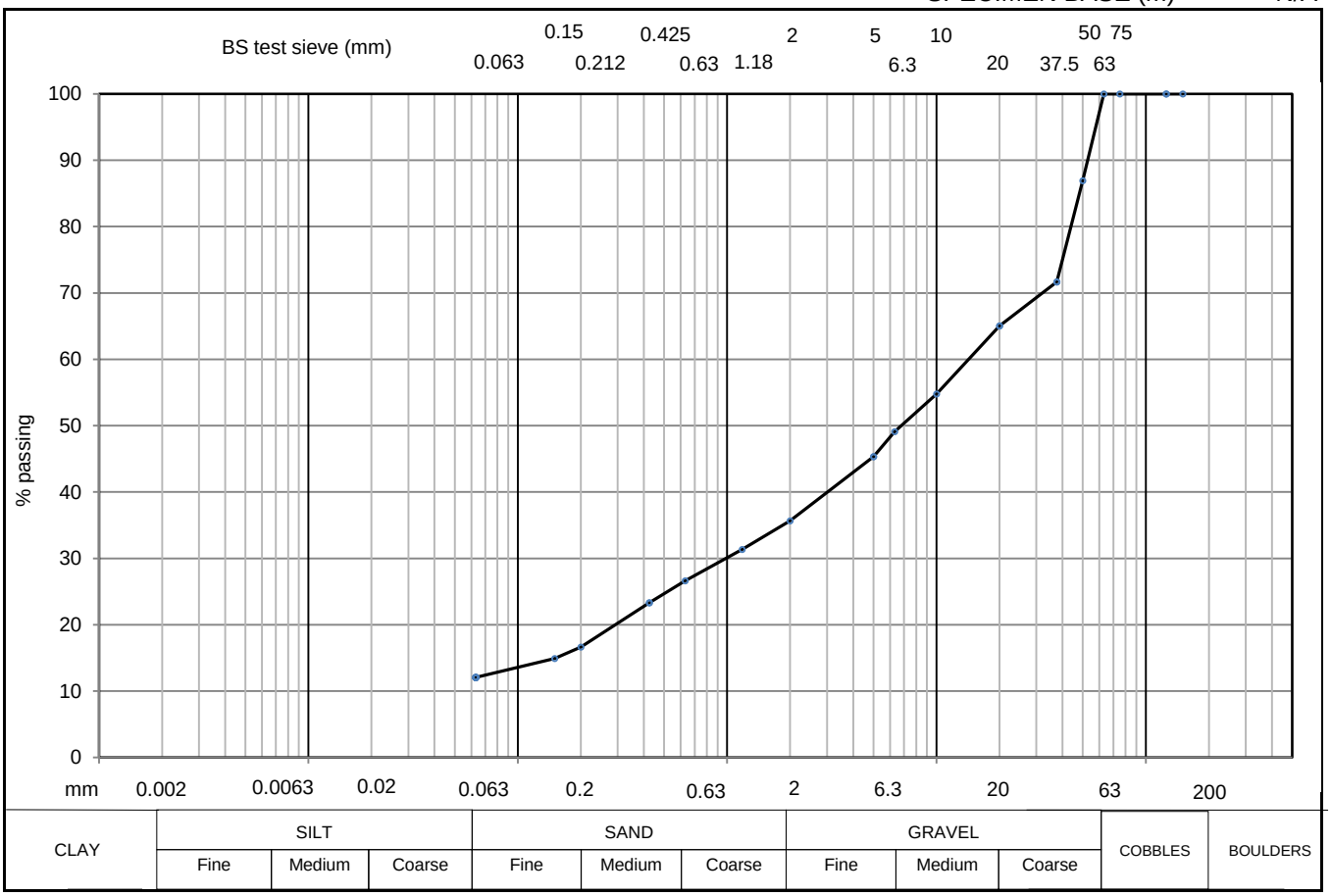
CONTRACT	CHECKED
38113	**TB**

Geotechnical Engineering Limited

PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP217
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	4B
		SAMPLE DEPTH (m)	2.00
DESCRIPTION	Brown clayey very sandy GRAVEL	SPECIMEN TOP (m)	2.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	12
SAND	24
GRAVEL	64
COBBLE & BOULDER	0
test method(s)	5.2
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	
75	
63	100
50	87
37.5	72
20	65
10	55
6.3	49

BS test sieve (mm)	% passing
5	45
2	36
1.18	31
0.63	27
0.425	23
0.2	17
0.15	15
0.063	12

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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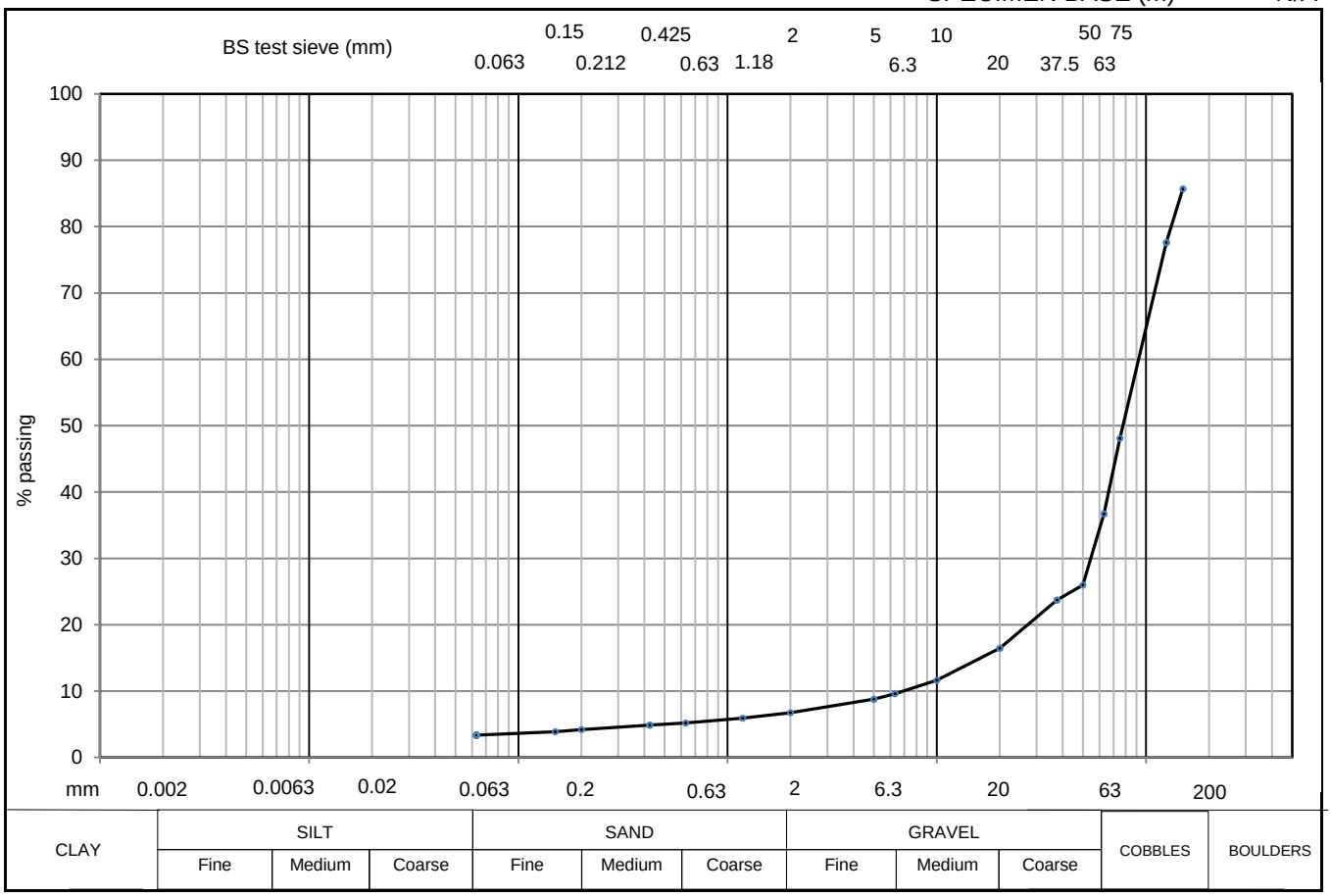
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP218
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with slightly clayey slightly sandy gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	3
SAND	3
GRAVEL	30
COBBLE & BOULDER	63
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	86	5	9	20	
75	48	2	7	6	
63	37	1.18	6	2	
50	26	0.63	5		
37.5	24	0.425	5		
20	16	0.2	4		
10	12	0.15	4		
6.3	10	0.063	3		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
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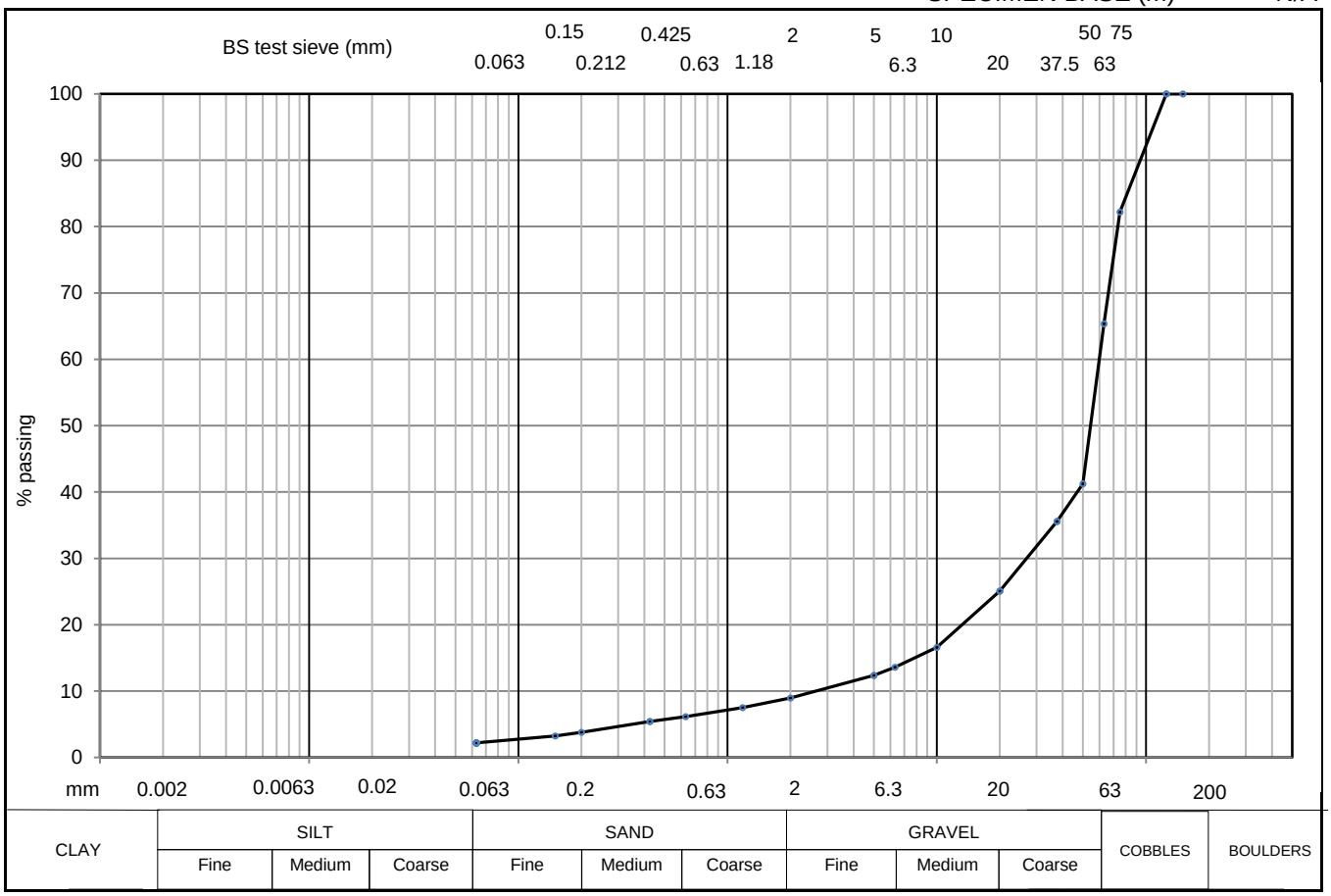
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP218
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown slightly clayey sandy GRAVEL with high cobble content	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	2
SAND	7
GRAVEL	56
COBBLE & BOULDER	35
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	12	20	
75	82	2	9	6	
63	65	1.18	8	2	
50	41	0.63	6		
37.5	36	0.425	5		
20	25	0.2	4		
10	17	0.15	3		
6.3	14	0.063	2		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
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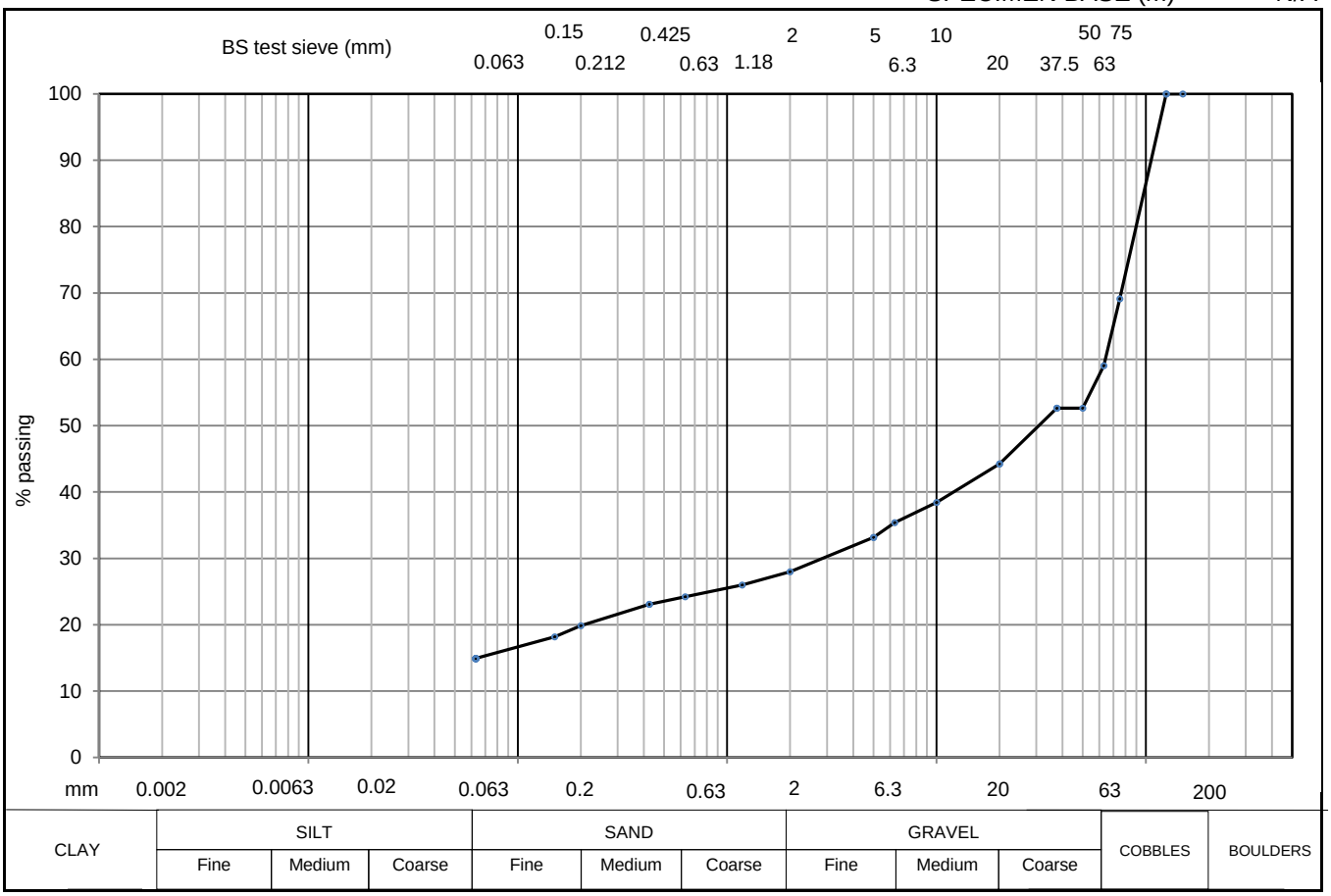
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP219
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with sandy clayey gravel	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	15
SAND	13
GRAVEL	31
COBBLE & BOULDER	41
test method(s)	5.2#
test method	
5.2 - sieving	
5.3 - sedimentation by hydrometer	
5.4 - sedimentation by pipette	

BS test sieve (mm)	% passing
150	100
75	69
63	59
50	53
37.5	53
20	44
10	38
6.3	35

BS test sieve (mm)	% passing
5	33
2	28
1.18	26
0.63	24
0.425	23
0.2	20
0.15	18
0.063	15

BS test sieve (µm)	% finer
20	
6	
2	

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
38113	**TB**

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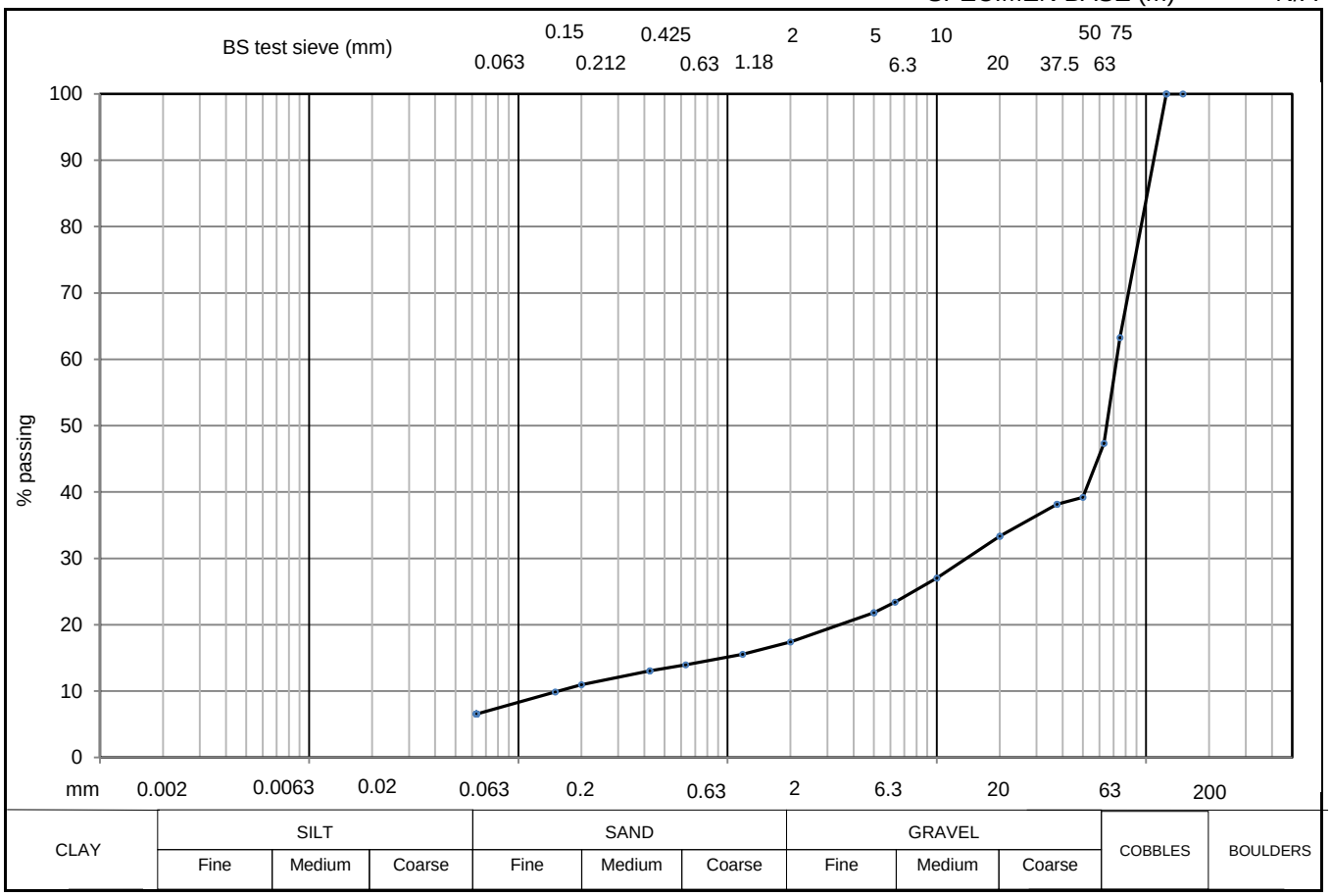
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP219
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	2B
		SAMPLE DEPTH (m)	1.00
DESCRIPTION	Brown COBBLES with clayey sandy gravel	SPECIMEN TOP (m)	1.00
		SPECIMEN BASE (m)	N/A



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	7
SAND	11
GRAVEL	30
COBBLE & BOULDER	53
test method(s)	5.2#

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	22	20	
75	63	2	17	6	
63	47	1.18	16	2	
50	39	0.63	14		
37.5	38	0.425	13		
20	33	0.2	11		
10	27	0.15	10		
6.3	23	0.063	7		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
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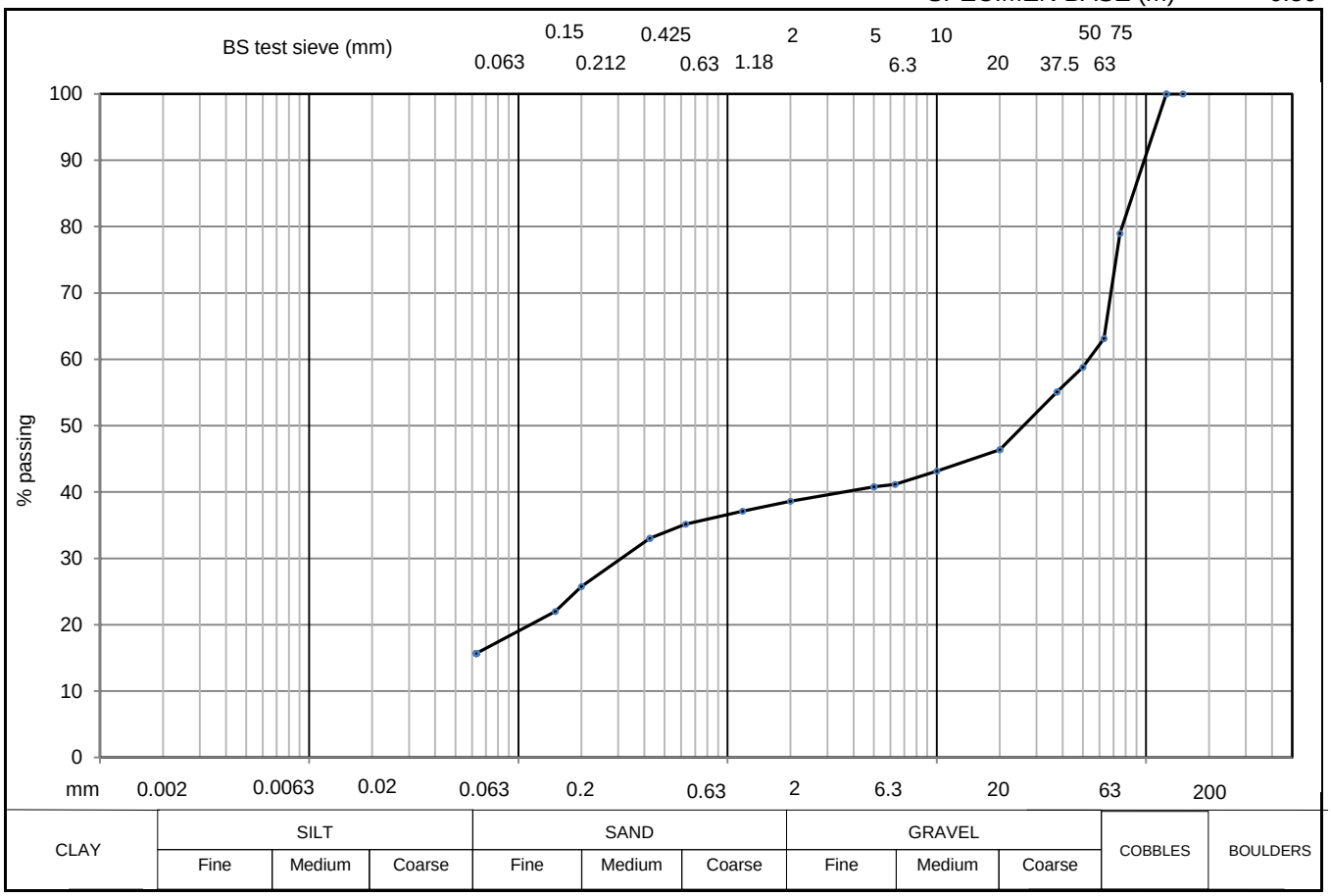
PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892 - 4 : 2016 : 5

CLIENT	TRIVALLIS	BH/TP No.	TP220
SITE	PENRHYS VILLAGE, RHONDDA CYNON TAFF	SAMPLE No./TYPE	1B
		SAMPLE DEPTH (m)	0.50
DESCRIPTION	Brown COBBLES with clayey very sandy gravel and rare rootlets	SPECIMEN TOP (m)	0.50
		SPECIMEN BASE (m)	0.50



soil type	% fraction
CLAY	
SILT	
SILT & CLAY	16
SAND	23
GRAVEL	25
COBBLE & BOULDER	37
test method(s)	5.2

test method

5.2 - sieving

5.3 - sedimentation by hydrometer

5.4 - sedimentation by pipette

BS test sieve (mm)	% passing	BS test sieve (mm)	% passing	BS test sieve (µm)	% finer
150	100	5	41	20	
75	79	2	39	6	
63	63	1.18	37	2	
50	59	0.63	35		
37.5	55	0.425	33		
20	46	0.2	26		
10	43	0.15	22		
6.3	41	0.063	16		

remarks

# denotes sample tested is smaller than that which is recommended in accordance with BS EN 17892

Particle density assigned an assumed value of 2.70 Mg/m3

CONTRACT	CHECKED
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Geotechnical Engineering Limited

ROCK WATER CONTENT

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample no./type	sample depth (m)	specimen depth (m)	natural water content (%)	description and remarks
BH302B	21C	6.50	6.80	1	Brown SANDSTONE
BH304	22CS	8.45	8.45	1	Grey SANDSTONE
BH305	19C	5.00	5.20	2	Grey SANDSTONE
BH307	12C	4.00	4.60	1.1	Brown SANDSTONE

general remarks
natural water content determined unless otherwise specified

test method
samples oven dried at 105°C

CONTRACT	CHECKED
38113	**TB**

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Sample details				Density				Uniaxial Compression Test (LF0879C (1000kN) compression frame used)							
								Mean after prep.							
Borehole Ref.	Sample Ref.	Depth (m)	Description	MC (%)	Degree of Saturation (%)	Bulk (Mg/m³)	Dry (Mg/m³)	Diameter (mm)	Height (mm)	H/D Ratio	Load at Failure (kN)	UCS (MPa) 3 sig. fig.	Failure Sketch	D. Tested	Remarks
BH303B		7.25-7.45	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	0.8	15.5	2.55	2.53	55.00	117.10	2.1	134.7	56.7		03/06/24	
BH306		5.50-5.70	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	1.5	34.3	2.61	2.57	54.40	141.60	2.6	146.0	62.8		03/06/24	
BH306		8.50-8.80	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	2.1	44.7	2.61	2.55	117.40	276.20	2.4	765.8	70.7		03/06/24	
BH307		5.80-6.10	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	0.9	12.7	2.43	2.41	117.20	236.10	2.0	775.6	71.9		03/06/24	

Note: The dimensional requirements of flatness (<0.02 mm), perpendicularity (<0.05 / 50 mm) and straightness (0.3 mm deviation) are all met. Specific Gravity used for Degree of Saturation is assumed unless specified by the client.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS®

UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH303B
Sample Ref.:	-
Depth (m):	7.25-7.45

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

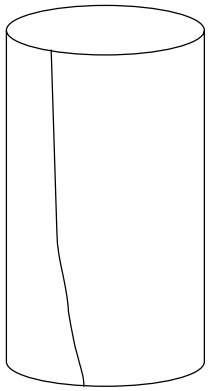
Diameter	55.00 mm
Height	117.10 mm
Bulk Density	2.55 Mg/m³
Dry Density	2.53 Mg/m³
Water Content	0.8 %

Degree of Saturation: 15.5 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/06/2024

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength Maximum load (kN): 134.70	56.7 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS

UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH306
Sample Ref.:	-
Depth (m):	5.50-5.70

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

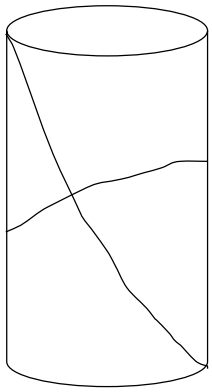
Diameter	54.40 mm
Height	141.60 mm
Bulk Density	2.61 Mg/m³
Dry Density	2.57 Mg/m³
Water Content	1.5 %

Degree of Saturation: 34.3 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Multiple fracturing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Date tested: 03/06/2024

Test results

Unconfined Compressive Strength Maximum load (kN): 146.00	62.8 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Sample type	**C**

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
38113

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UKAS TESTING 1982

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH306
Sample Ref.:	-
Depth (m):	8.50-8.80

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

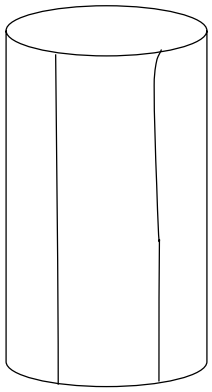
Diameter	117.40 mm
Height	276.20 mm
Bulk Density	2.61 Mg/m³
Dry Density	2.55 Mg/m³
Water Content	2.1 %

Degree of Saturation: 44.7 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Axial splitting



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Date tested: 03/06/2024

Test results

Unconfined Compressive Strength Maximum load (kN): 765.80	70.7 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
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ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIALS

Borehole Ref.:	BH307
Sample Ref.:	-
Depth (m):	5.80-6.10

Description:
Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered

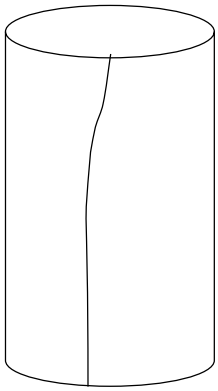
Diameter	117.20 mm
Height	236.10 mm
Bulk Density	2.43 Mg/m³
Dry Density	2.41 Mg/m³
Water Content	0.9 %

Degree of Saturation: 12.7 % Specific Gravity: 2.9 Mg/m³ (Assumed)

LF0879C (1000kN) compression frame used

Failure Sketch

Mode of failure: Diagonal shearing



Solid lines for material failures.
Dashed lines for apparent weakness failure.

Date tested: 03/06/2024

Angle of foliation/Axis of loading: n/a
Angle of shear plane/Axis of loading: n/a

Sample type	C

Test results

Unconfined Compressive Strength Maximum load (kN): 775.60	71.9 MPa
Young's Modulus (tangential at 50% failure load)	n/a
Poisson's Ratio (tangential at 50% failure load)	n/a
Young's Modulus (secant at 10% failure load)	n/a
Poisson's Ratio (secant at 10% failure load)	n/a

Note: The dimensional requirements of Flatness (<0.02 mm), Perpendicularity (<0.05 / 50 mm) and Straightness (0.3 mm deviation) are all met.

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF
38113

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UKAS TESTING 1982

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POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH301	6.05	I	U	P	110	80	70	11.15	99.01	1.14	1.36	1.55	Brown SANDSTONE
BH301	7.35	I	U	P	110	90	50	14.55	83.68	2.08	1.26	2.62	Brown SANDSTONE
BH302B	6.40	I	U	P	110	80	90	7.71	112.27	0.61	1.44	0.88	Brown SANDSTONE
BH302B	6.80	I	U	P	90	80	70	9.24	89.56	1.15	1.30	1.50	Grey SANDSTONE
BH302B	8.60	I	U	P	120	50	70	20.47	103.42	1.91	1.39	2.65	Grey SANDSTONE
BH303B	5.25	A	X	P	120		50	34.80	87.40	4.56	1.29	5.86	Grey SANDSTONE
BH303B	5.25	D	Y	P		40	120	14.36	120.00	1.00	1.48	1.48	Grey SANDSTONE
BH304	4.40	A	X	P	120		50	16.46	87.40	2.15	1.29	2.77	Grey SANDSTONE
BH304	4.40	D	Y	P		40	120	31.17	120.00	2.16	1.48	3.21	Grey SANDSTONE
BH304	6.80	I	U	P	120	60	90	26.41	117.26	1.92	1.47	2.82	Grey SANDSTONE
BH304	8.45	A	X	N	120		100	46.07	123.61	3.02	1.50	4.53	Grey SANDSTONE
BH304	8.45	D	Y	N		100	120	45.09	120.00	3.13	1.48	4.64	Grey SANDSTONE
BH305	4.40	I	U	P	120	50	90	6.48	117.26	0.47	1.47	0.69	Grey SANDSTONE
BH305	5.20	I	U	P	120	40	70	24.35	103.42	2.28	1.39	3.16	Grey SANDSTONE
BH305	7.20	I	U	P	100	50	80	5.30	100.93	0.52	1.37	0.71	Grey SANDSTONE
BH306	4.60	A	X	P	120		70	>50	103.42	>4.67	1.39	>6.48	Grey SANDSTONE
BH306	4.60	D	Y	P		40	120	23.77	120.00	1.65	1.48	2.45	Grey SANDSTONE
BH307	4.60	A	X	P	120		40	20.01	78.18	3.27	1.22	4.00	Brown SANDSTONE
BH307	4.60	D	Y	P		40	120	0.75	120.00	0.05	1.48	0.08	Brown SANDSTONE

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**38113**	**TB**
I - irregular lump	Z - oblique		S - soaked		

Geotechnical Engineering Limited

POINT LOAD STRENGTH TEST

I.S.R.M. Suggested Methods : 2007 Edition

CLIENT TRIVALLIS

SITE PENRHYS VILLAGE, RHONDDA CYNON TAFF

borehole /trial pit no.	sample depth (m)	test type	test orien-tation	moisture condition	width W (mm)	length L (mm)	platen sep. D (mm)	failure load P (kN)	equiv. diam. De (mm)	Is (MPa)	size factor	Is(50) (MPa)	description and remarks
BH307	4.05	A	X	N	120		60	6.40	95.75	0.70	1.34	0.94	Grey SANDSTONE
BH307	4.05	D	Y	N		70	100	1.50	100.00	0.15	1.37	0.20	Grey SANDSTONE
BH307	5.60	A	X	P	120		40	22.86	78.18	3.74	1.22	4.57	Grey SANDSTONE
BH307	5.60	D	Y	P		40	120	8.73	120.00	0.61	1.48	0.90	Grey SANDSTONE

general remarks

tests carried out in accordance with I.S.R.M.(2007): Suggested Methods for Determining Point Load Strength

test machine PLM02

test type	test orientation relative to discontinuities		moisture condition	CONTRACT	CHECKED
A - axial	X - perpendicular	U - unknown	N - natural moisture content		
D - diametral	Y - parallel		P - partially air dried	**38113**	**TB**
I - irregular lump	Z - oblique		S - soaked		

ISRM Suggested Methods - Rock Characterization Testing and Monitoring 1974 - 2006 In-house Technical Procedure TP35

DETERMINATION OF POINT LOAD STRENGTH ON ROCK

Sample details				Point Load test											
Borehole Ref.	Sample Ref.	Depth (m)	Description	D. Tested	Test type & Direction		Sample width W (mm)	Platen separation (mm)		Water Content (%)	Equiv. Diameter D_e (mm)	Failure Load P (kN)	I_s P/De^2 (MPa)	Correction Factor F	Point Load Index $I_{s(50)}$ (MPa)
								Start D	End D'						
BH301		4.00-5.50	Strong grey fine to medium grained SANDSTONE. Fresh to slightly weathered	04/06/24	I	U	77.1	71.5	71.5		83.8	10.27	1.46	1.26	1.84

(*) Sample failed on weakness

Test type and direction: **D** - Diametral **A** - Axial **B** - Block **I** - Irregular lump **P** - Perpendicular to planes of weakness **U** - Random or unknown orientation **L** - Parallel to planes of weakness

Checked and Approved by

IT

I Tabios (Head of Department)

Date: 06/06/2024

Project Number:

GEO / 40557

Project Name:

PENRHYS VILLAGE, RHONDDA CYNON TAFF

38113

GEOLABS®

UKAS TESTING 1982

Hydrock

Client	Location or material to which this assessment applies
Trivallis	Made Ground
Project	
Penrhys Village	
Job number	
30603	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	10	10	
No. tests in 20% data set	2	2	
No. tests with suspected pyrite		0	
Maximum value	521	0.2	
Mean of highest two values	319	0	
Mean of highest 20%	300	0	
Characteristic Value	**300**	**0.2**	
			Mg not required

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

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

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

Water data

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

DS Class

pH data

	Soil	Water
Number of tests	10	0
No. tests in 20% data set	2	
Lowest pH	7.4	
Mean of lowest 20%	7.6	
Characteristic value	**7.6**	
Design value	**7.6**	

Number of soil pH results less than 5.5: 0

DS Class design value

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

ACEC Class design value

Brownfield

Mobile groundwater **AC-1**

Appendix D Ground Gas Monitoring Assessments

Hydrock

Site: Penrhys Village, Rhondda Cynon Taff
Job number: C-30603
Client: Trivallis

Gas analyser: GFM 435
Equipment check OK: Y
Service in date: Y
Calibration check OK: Y
Name of person monitoring: Geotechnical Engineering Ltd

Notes on site conditions:

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

Monitoring round		Borehole details						Pressure and flow					Gas concentrations										GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipie & filter pack) (m^3)	Atmospheric pressure (hPa)	Atm pressure falling / rising / steady	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	VOC (as ppm using PID)	CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases PID	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
														Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady				
								Max. individual values:				**0.5**		**0.2**				**7.4**		**20.7**			**0.0002**	**0.0074**	**Summary statistics for this monitoring period.**
								Min. individual values:				0.1		0.0				0.0		0.0			0	0	
								Worst-case GSVs based on max. individual flow and max. individual conc. over the duration of this table:															**0.001**	**0.037**	
17/05/24	11:50	BH301	S	1.0 - 2.5	2.50	D	0.00878	974		0.00	0.1	0.1		0	0		0	0	16.9	16.8		0	0	Hole dry.
23/05/24	11:50	BH301	S	1.0 - 2.5	2.50	D	0.00878	976		0.00	0.1	0.1		0	0		0.1	0	17.8	17.9		0	0	Hole dry.
31/05/24	10:50	BH301	S	1.0 - 2.5	2.50	D	0.00878	981		0.00	0.1	0.1		0	0		0.7	0.1	19.3	19.3		0	0.0001	Hole dry.
14/06/24	11:00	BH301	S	1.0 - 2.5	2.50	D	0.00878	981		0.01	0.1	0.1	0.6	0.0	0.0		0.0	0.0	19.6	19.3		0	0	Hole dry.
21/06/24	10:00	BH301	S	1.0 - 2.5	2.50	D	0.00878	974		0.00	0.1	0.1	0	0.0	0.0		0.5	0.0	20.4	18.7		0	0	Hole dry.
28/06/24	10:45	BH301	S	1.0 - 2.5	2.50	D	0.00878	979		0.00	0.1	0.1	9.8	0.0	0.0		0.1	0.0	20.5	20.5		0	0	Hole dry.
17/05/24	12:15	BH302B	S	2.8 - 9.30	9.30	D	0.03504	970		0.00	0.1	0.1		0	0		1.7	2.2	18	16.6		0	0.0022	Hole dry.
23/05/24	12:05	BH302B	S	2.8 - 9.30	9.30	D	0.03504	974		0.00	0.1	0.1		0	0		2.3	2.3	16.9	16.8		0	0.0023	Hole dry.
31/05/24	11:10	BH302B	S	2.8 - 9.30	9.30	D	0.03504	982		0.00	0.1	0.1		0	0.0		2.1	2.4	18.2	17.3		0	0.0024	Hole dry.
14/06/24	10:00	BH302B	S	2.8 - 9.30	9.30	D	0.03504	958		-0.02	-0.1	0.1	1.8	0.0	0.0		0.9	2.9	19.3	15.4		0	0.0029	Hole dry.
21/06/24	10:25	BH302B	S	2.8 - 9.30	9.30	D	0.03504	974		0.00	0.1	0.1	2.2	0.0	0.0		0.5	2.8	19.4	17.8		0	0.0028	Hole dry.
28/06/24	11:10	BH302B	S	2.8 - 9.30	9.30	D	0.03504	976		0.00	0.1	0.1	6.1	0.0	0.0		0.5	2.5	20.8	18.0		0	0.0025	Hole dry.
17/05/24	12:55	BH303B	S	1.0 - 2.4	2.40	D	0.00833	970		0.00	0.1	0.1		0	0.0		0.1	0.1	20.2	20.3		0	0.0001	Hole dry.
23/05/24	12:25	BH303B	S	1.0 - 2.4	2.40	D	0.00833	975		0.00	0.1	0.1		0	0		0.1	0.1	19.7	19.7		0	0.0001	Hole dry.
31/05/24	11:35	BH303B	S	1.0 - 2.4	2.40	D	0.00833	981		0.00	0.1	0.1		0	0		0.7	1	20.3	20.7		0	0.001	Hole dry.
14/06/24	12:05	BH303B	S	1.0 - 2.4	2.40	D	0.00833	961		0.20	0.5	0.5	0.9	0.0	0.0		0.8	0.1	18.2	19.5		0	0.0005	Hole dry.
21/06/24	10:45	BH303B	S	1.0 - 2.4	2.40	D	0.00833	974		0.00	0.1	0.1	1.6	0.0	0.0		1	0.2	18.8	20.3		0	0.0002	Hole dry.
28/06/24	11:40	BH303B	S	1.0 - 2.4	2.40	D	0.00833	977		0.00	0.1	0.1	3.9	0.0	0.0		1	0.1	19.3	20.4		0	0.0001	Hole dry.
17/05/24	14:00	BH304	S	1.0 - 3.6	3.60	D	0.01378	974		0.00	0.1	0.1		0.0	0.0		4.9	5.0	9.4	8.8		0	0.005	Carbon monoxide recorded initial 10ppm, steady 10ppm
23/05/24	13:30	BH304	S	1.0 - 3.6	3.60	D	0.01378	980		0.00	0.1	0.1		0.0	0.0		7.2	7.4	9.7	9.2		0	0.0074	Hole dry.
31/05/24	13:05	BH304	S	1.0 - 3.6	3.60	D	0.01378	984		0.00	0.1	0.1		0	0		0.1	6.9	21.1	8.6		0	0.0069	Hole dry.
14/06/24	14:40	BH304	S	1.0 - 3.6	3.60	D	0.01378	963		0.03	0.1	0.1	4.5	0.0	0.0		1.2	5.9	3.5	14.6		0	0.0059	Hole dry.
21/06/24	12:40	BH304	S	1.0 - 3.6	3.60	D	0.01378	978		0.00	0.1	0.1	19.2	0.0	0.0		1.6	5.9	9.0	12.6		0	0.0059	Hole dry.
28/06/24	13:15	BH304	S	1.0 - 3.6	3.60	D	0.01378	979		0.00	0.1	0.1	14.3	0.0	0.0		1.5	6.2	8..4	14.7		0	0.0062	Hole dry.
17/05/24	13:40	BH305	S	1.0 - 3.2	3.20	D	0.01196	973		-0.02	-0.3	0.3		0.0	0.0		0.6	0.6	19.9	19.8		0	0.0018	Hole dry.
23/05/24	13:05	BH305	S	1.0 - 3.2	3.20	D	0.01196	978		0.00	0.1	0.1		0.0	0.0		0.5	0.5	19.8	19.8		0	0.0005	Hole dry.
31/05/24	12:45	BH305	S	1.0 - 3.2	3.20	D	0.01196	983		0.00	0.1	0.1		0	0		0.2	0.5	20.1	20.6		0	0.0005	Hole dry.
14/06/24	13:30	BH305	S	1.0 - 3.2	3.20	D	0.01196	965		0.12	0.2	0.3	0.4	0.0	0.0		0.5	0.4	18.6	19.5		0	0.0008	Hole dry.

Monitoring round		Borehole details						Pressure and flow					Gas concentrations									GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipie & filter pack) (m^3)	Atmospheric pressure (hPa)	Atm pressure falling / rising / steady	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	VOC (as ppm using PID)	CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases PID	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
														Initial	Steady	Initial	Steady	Initial	Steady	Initial	Steady				
21/06/24	11:45	BH305	S	1.0 - 3.2	3.20	D	0.01196	977		0.00	0.1	0.1	8.0	0.0	0.0			0.6	0.7	19.6	20.3		0	0.0007	Hole dry.
28/06/24	12:30	BH305	S	1.0 - 3.2	3.20	D	0.01196	979		0.00	0.1	0.1	5.5	0.0	0.0			0.5	0.5	19.2	20.6		0	0.0005	Hole dry.
17/05/24	13:15	BH306	S	3.0 - 8.2	8.20	D	0.02952	972		0.00	0.1	0.1		0.0	0.0			0.5	0.5	18.9	18.8		0	0.0005	Hole dry.
23/05/24	12:00	BH306	S	3.0 - 8.2	8.20	D	0.02952																		Headworks flooded, gas monitoring terminated due to water uptake. Installation pipe dry.
31/05/24	12:05	BH306	S	3.0 - 8.2	8.20	D	0.02952	985		0.00	0.1	0.1		0	0.0			0.5	0.6	19.1	18.4		0	0.0006	Hole dry.
14/06/24	12:40	BH306	S	3.0 - 8.2	8.20	D	0.02952	963		0.02	0.1	0.1	3.6	0.0	0.0			0.5	0.7	19.7	17.5		0	0.0007	Hole dry.
21/06/24	11:25	BH306	S	3.0 - 8.2	8.20	D	0.02952	978		0.00	0.1	0.1	18.5	0.0	0.0			0.2	0.7	21.0	19.0		0	0.0007	Hole dry.
28/06/24	12:00	BH306	S	3.0 - 8.2	8.20	D	0.02952	980		0.00	0.1	0.1	4.8	0.0	0.0			0.4	0.7	20.8	18.4		0	0.0007	Hole dry.
17/05/24	15:00	BH307	S	1.4 - 9.5	2.50		0.00775																		Gas monitoring not undertaken, gas tap replaced due to damage.
23/05/24	14:15	BH307	S	1.4 - 9.5	2.58		0.00811	982		0.00	0.1	0.1		0	0.0			0.9	1.2	5.9	3.9		0	0.0012	Headworks flooded, water bailed out.
31/05/24	13:25	BH307	S	1.4 - 9.5	2.50		0.00775	989		0.00	0.1	0.1		0.0	0			1.2	1.4	4.6	0.9		0	0.0014	
14/06/24	14:05	BH307	S	1.4 - 9.5	4.31		0.01597	966		0.04	0.1	0.1	99.2	0.0	0.0			0.6	1.2	16.8	0.0		0	0.0012	
21/06/24	12:10	BH307	S	1.4 - 9.5	4.60		0.01729	981		0.00	0.1	0.1	103.0	0.0	0.0			0.6	1	20.1	0.1		0	0.001	
28/06/24	12:55	BH307	S	1.4 - 9.5	6.99		0.02816	983		0.00	0.1	0.1	108.6	0.0	0.2			0.2	1.2	20.4	0.2		0.0002	0.0012	Carbon monoxide recorded initial 0ppm, steady 25ppm.

Appendix E Contamination Assessments

GAC derivation

Background

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

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

Land use scenarios

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

All GAC have been rounded to two significant figures.

Exposure parameters

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

Approach to consumption rates

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

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

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

Chemical and toxicity parameters

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

- IRIS, 2016. 'Toxicological Review of Trimethylbenzenes'. Integrated Risk Information System, National Centre for Environmental Assessment, office of Research and Development, U.S. Environmental Protection Agency.
- LQM/CIEH, 2015.

- ORNL, 1984. 'ORNL-5786. A Review and Analysis of Parameters for Assessing Transport of Environmentally released Radionuclides through Agriculture'. Oak Ridge National Laboratory.
- CL:AIRE, 2010.
- RIVM, 2001. RIVM Report 711701 025 'HCV Re-evaluation of human-toxicological maximum-permissible risk levels'. National Institute of Public Health and the Environment.
- LQM/CIEH, 2009.
- EA, 2009a.

Approach to Cyanide GAC

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

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

Approach to Phenol GAC

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

Approach to PCB GAC

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

Sub-surface soil to indoor air correction factors

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

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

- TPHCWG fractions, namely aliphatic EC>5-44 and aromatic EC>6-44;
- PAHs (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene), benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h,)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene);
- BTEX;
- Isopropylbenzene;
- Propylbenzene;
- 1,2,4- and 1,3,5-trimethylbenzene; and
- Styrene.

Approach to saturation limits

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

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

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

References

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

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

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

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Human health GQRA

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter: Default - Human Health - residential with home-grown produce (2.5%SOM)
Client: Trivallis
Site: Penrhys Village, Rhondda Cynon Taff
Job no.: 30603
Lab. report no(s).: 24-014999, 24-015003, 24-016507, 24-016568, 24-018446, 24-018448, 24-018451, 24-018460, 24-018462.

Hydrock

Data Filters
Zone: A
Strata: MG
Depth Min (m bgl): 0.2
Depth Max (m bgl): 3.55

Dataset mean SOM%: 2.42
Scenario SOM%: 2.5

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Statistical Assessment?	Central Limit Theorem Statistical Assessment (after CL:AIRE 2020) Upper Confidence Limit 80%	95%	99%	Results of Significance Test
-	**Asbestos**																	
Ps020	Asbestos Identified	text	Y/N	33	-	-	-	-	No. of detects:	0	-	-	-		-	-	-	-
Ps889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-					
Ps885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-					
Ps935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-					
Ps826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-					
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-					
Ps880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-					
-	**Hydrock Default Suite - FOC / SOM / pH**										-							
Ps085	FOC (dimensionless)	||	0.001	0					-		-		-					
-	SOM (calculated)	%	0.1724	24	0.90	5.50	2.42	2.40	1.26		-	-	-		-	-	-	-
Ps334	pH (su)	pH Units	0.1	32	6.50	12.30	9.16	8.50	1.57		-	-	-		-	-	-	-
-	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	24	6.10	37.00	14.97	13.00	7.33	**1**	NR	37	C4SL - CL:AIRE 2014	Y	16.94	18.07	19.17	Potentially Suitable for Use
7440-41-7	Beryllium	mg/kg	0.06	24	0.35	0.91	0.60	0.59	0.16	0	NR	1.7	Hydrock Derived	Y	0.64	0.67	0.69	Potentially Suitable for Use
7440-42-8	Boron	mg/kg	0.2	24	0.20	1.80	0.44	0.20	0.46	0	NR	300	Hydrock Derived	Y	0.56	0.63	0.70	Potentially Suitable for Use
7440-43-9	Cadmium	mg/kg	0.2	24	0.20	0.50	0.23	0.20	0.08	0	NR	22	C4SL - CL:AIRE 2014	Y	0.26	0.27	0.28	Potentially Suitable for Use
16065-83-1	Chromium (III)	mg/kg	1	24	14.00	38.00	20.38	17.00	7.66	0	NR	890	Hydrock Derived	Y	22.44	23.61	24.76	Potentially Suitable for Use
18540-29-9	Chromium (VI)	mg/kg	1.8	24	1.80	1.80	1.80	1.80	0.00	0	NR	21	C4SL - CL:AIRE 2014	Y	1.80	1.80	1.80	Potentially Suitable for Use
7440-47-3	Chromium (Total)	mg/kg	1	0										N				
7440-50-8	Copper	mg/kg	1	24	8.60	61.00	22.68	18.00	13.42	0	NR	2500	Hydrock Derived	Y	26.29	28.35	30.37	Potentially Suitable for Use
7439-92-1	Lead	mg/kg	1	24	9.10	110.00	31.25	20.00	28.04	0	NR	200	C4SL - CL:AIRE 2014	Y	38.81	43.09	47.32	Potentially Suitable for Use
7439-97-6	Mercury, inorganic	mg/kg	0.3	24	0.30	0.30	0.30	0.30	0.00	0	NR	40	Hydrock Derived	Y	0.30	0.30	0.30	Potentially Suitable for Use
7440-02-0	Nickel	mg/kg	1	24	8.60	30.00	17.86	19.00	6.37	0	NR	130	Hydrock Derived	Y	19.58	20.55	21.51	Potentially Suitable for Use
7782-49-2	Selenium	mg/kg	1	24	1.00	2.30	1.07	1.00	0.27	0	NR	260	Hydrock Derived	Y	1.14	1.19	1.23	Potentially Suitable for Use
7440-62-2	Vanadium	mg/kg	1	24	11.00	50.00	23.67	21.50	7.65	0	NR	410	Hydrock Derived	Y	25.73	26.90	28.05	Potentially Suitable for Use
7440-66-6	Zinc	mg/kg	1	24	37.00	280.00	94.46	75.00	62.01	0	NR	3900	Hydrock Derived	Y	111.16	120.64	129.99	Potentially Suitable for Use
Ps095	Cyanide (free)	mg/kg	1	24	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020	Y	1.00	1.00	1.00	Potentially Suitable for Use
Ps186	Total Phenols (Monohydric)	mg/kg	1	24	1.00	1.00	1.00	1.00	0.00	0	38058	210	Hydrock Derived	Y	1.00	1.00	1.00	Potentially Suitable for Use
83-32-9	Acenaphthene	mg/kg	0.05	24	0.05	0.66	0.12	0.05	0.14	0	141	540	Hydrock Derived	Y	0.16	0.18	0.20	Potentially Suitable for Use
208-96-8	Acenaphthylene	mg/kg	0.05	24	0.05	0.12	0.05	0.05	0.01	0	212	440	Hydrock Derived	Y	0.06	0.06	0.06	Potentially Suitable for Use
120-12-7	Anthracene	mg/kg	0.05	24	0.05	0.96	0.14	0.05	0.20	0	2.91	5500	Hydrock Derived	Y	0.19	0.22	0.25	Potentially Suitable for Use
56-55-3	Benzo[a]anthracene	mg/kg	0.05	24	0.05	3.00	0.68	0.38	0.80	0	4.28	12	Hydrock Derived	Y	0.90	1.02	1.14	Potentially Suitable for Use
50-32-8	Benzo[a]pyrene	mg/kg	0.05	24	0.05	2.90	0.70	0.21	0.86	0	2.28	5	C4SL - CL:AIRE 2014	Y	0.93	1.06	1.19	Potentially Suitable for Use
205-99-2	Benzo[b]fluoranthene	mg/kg	0.05	24	0.05	**4.20**	1.07	0.68	1.20	**2**	3.04	3.3	Hydrock Derived	Y	1.39	1.58	1.76	Potentially Suitable for Use
191-24-2	Benzo[ghi]perylene	mg/kg	0.05	24	0.05	1.60	0.48	0.32	0.51	0	0.04	340	Hydrock Derived	Y	0.62	0.70	0.78	Potentially Suitable for Use
207-08-9	Benzo[k]fluoranthene	mg/kg	0.05	24	0.05	1.30	0.40	0.24	0.43	0	1.72	93	Hydrock Derived	Y	0.52	0.58	0.65	Potentially Suitable for Use
218-01-9	Chrysene	mg/kg	0.05	24	0.05	3.50	0.86	0.49	0.98	0	1.10	22	Hydrock Derived	Y	1.12	1.27	1.42	Potentially Suitable for Use
53-70-3	Dibenz[ah]anthracene	mg/kg	0.05	24	0.05	**0.75**	0.19	0.07	0.22	**5**	0.010	0.29	Hydrock Derived	Y	0.24	0.28	**0.31**	Borderline - Review Statistics
206-44-0	Fluoranthene	mg/kg	0.05	24	0.05	5.80	1.10	0.61	1.45	0	47	560	Hydrock Derived	Y	1.49	1.71	1.93	Potentially Suitable for Use
86-73-7	Fluorene	mg/kg	0.05	24	0.05	0.69	0.12	0.05	0.14	0	77	420	Hydrock Derived	Y	0.16	0.18	0.20	Potentially Suitable for Use
193-39-5	Indeno[123cd]pyrene	mg/kg	0.05	24	0.05	1.60	0.46	0.31	0.48	0	0.15	36	Hydrock Derived	Y	0.59	0.67	0.74	Potentially Suitable for Use
91-20-3	Naphthalene	mg/kg	0.05	24	0.05	0.22	0.07	0.05	0.04	0	183	30	Hydrock Derived	Y	0.08	0.09	0.09	Potentially Suitable for Use
85-01-8	Phenanthrene	mg/kg	0.05	24	0.05	4.00	0.61	0.21	0.88	0	90	220	Hydrock Derived	Y	0.84	0.98	1.11	Potentially Suitable for Use
129-00-0	Pyrene	mg/kg	0.05	24	0.05	4.30	0.88	0.53	1.14	0	5.5	1200	Hydrock Derived	Y	1.19	1.36	1.53	Potentially Suitable for Use
Ps310	PAH 16 Total	mg/kg	0.8	24	0.80	35.20	7.79	4.28	9.22			-		N	-	-	-	-

Date	15/01/24	18/01/24	23/01/24	22/01/24	23/01/24	23/01/24	23/01/24	23/01/24	01/05/24	01/05/24	01/05/24	01/05/24	30/01/24	30/01/24	30/01/24	30/01/24	25/01/24	25/01/24	25/01/24	25/01/24	25/01/24	25/01/24	25/01/24	02/05/24	02/05/24	29/01/24	29/01/24	29/01/24	30/01/24
Zone	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Location	BH301	BH306	BH302B	TP202	TP204	TP204	TP210	TP203	TP207A	TP208	BH305	BH305	TP216	TP205	TP213	TP217B	BH304	BH304	BH303B	BH303B	TP206A	TP212	TP214	TP215
Depth (m bgl)	1.1	0.6	1.1	0.5	0.5	2	2.5	0.5	0.5	1	0.2	1	0.5	1.5	1.5	1	0.2	1	0.2	1.1	0.5	1	0.5	0.5
Strata	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
1.3	2.4	3.5	1.3	5.5	2.8	1.6	2.4	1.2	2.7	3.1	1.6	1.2	1.5	3	1.9	5.2	0.9	4.5	0.9	2.4	2	2.4	2.8
10.8	7.4	11.2	8.5	11.3	8.9	8.1	9.6	11.1	8.2	7.6	9.7	8.1	10.5	8.5	8.3	7.9	8.2	8.5	12.3	8.1	8	6.5	8
12	10	37	11	33	23	14	13	9.4	11	12	11	6.1	13	14	14	24	8.8	16	12	12	13	13	17
0.69	0.47	0.41	0.41	0.57	0.68	0.6	0.39	0.45	0.57	0.75	0.65	0.7	0.45	0.87	0.75	0.91	0.73	0.78	0.35	0.45	0.54	0.74	0.45
1	0.2	0.5	0.2	1.8	1.1	<0.2	0.4	<0.2	0.3	<0.2	<0.2	0.2	1.6	<0.2	<0.2	0.5	<0.2	0.3	0.3	<0.2	<0.2	<0.2	<0.2
0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.5	0.3	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
15	16	38	14	37	30	15	22	15	15	20	16	28	17	19	19	37	16	16	19	15	17	19	14
<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
13	15	45	8.6	50	30	9.7	24	18	21	20	18	12	22	36	19	61	15	33	15	12	18	15	14
72	12	110	12	69	28	13	20	20	16	27	18	9.1	20	34	17	100	12	46	28	14	16	15	22
<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
10	20	12	8.6	19	23	23	12	9.7	16	21	17	29	9.5	23	24	23	24	19	9.9	15	19	30	12
<1	<1	<1	2.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.4	<1	<1	<1	<1	1
21	18	21	11	34	28	19	20	20	19	28	22	35	18	25	25	50	19	23	26	20	24	23	19
78	69	280	47	200	170	53	54	100	61	100	77	37	78	86	73	230	63	97	74	52	65	76	47
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
0.18	<0.05	<0.05	<0.05	0.12	0.07	<0.05	0.14	<0.05	<0.05	<0.05	<0.05	<0.05	0.66	0.3	<0.05	0.24	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	0.17
<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
0.36	<0.05	0.18	<0.05	0.2	0.06	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	0.96	0.15	<0.05	0.35	0.28	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1.1	<0.05	1.2	0.1	0.91	0.46	0.43	0.33	0.08	0.23	0.58	<0.05	<0.05	3	1.4	<0.05	2.2	1.8	0.77	<0.05	<0.05	<0.05	<0.05	1.4
0.64	<0.05	0.73	0.07	0.61	0.34	0.34	0.25	0.09	0.3	0.51	<0.05	<0.05	1.6	1.5	<0.05	1.5	1.1	0.7	<0.05	<0.05	<0.05	<0.05	0.95
0.67	<0.05	0.63	0.07	0.53	0.28	0.32	0.15	<0.05	0.19	0.35	<0.05	<0.05	1.3	1	<0.05	1.3	1.1	0.41	<0.05	<0.05	<0.05	<0.05	0.92
1.3	<0.05	1.4	0.13	1.1	0.59	0.57	0.41	0.1	0.37	0.78	<0.05	<0.05	3.5	2	0.09	2.6	2.4	1.1	<0.05	<0.05	<0.05	<0.05	1.8
0.19	<0.05	0.22	<0.05	0.21	0.11	0.12	<0.05	<0.05	0.08	0.13	<0.05	<0.05	0.75	0.57	<0.05	0.59	0.6	<0.05	<0.05	<0.05	<0.05	<0.05	0.31
2	<0.05	1.6	0.22	1.4	0.63	0.6	0.61	0.09	0.21	0.8	<0.05	<0.05	5.8	2.5	0.08	4.1	2.4	1.1	<0.05	<0.05	<0.05	<0.05	1.9
0.2	<0.05	0.09	<0.05	0.12	0.06	<0.05	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	0.69	0.16	<0.05	0.18	0.23	0.12	<0.05	<0.05	<0.05	<0.05	0.15
0.54	<0.05	0.69	<0.05	0.61	0.33	0.37	0.23	0.09	0.28	0.49	<0.05	<0.05	1.6	1.3	<0.05	1.4	1.1	0.69	<0.05	<0.05	<0.05	<0.05	0.91
0.08	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1	0.06	<0.05	0.19	<0.05	0.22	<0.05	<0.05	<0.05	<0.05	<0.05
1.2	<0.05	0.64	<0.05	0.94	0.38	0.2	0.58	0.08	0.07	0.22	<0.05	<0.05	4	1.3	0.06	1.8	1.1	0.68	<0.05	<0.05	<0.05	<0.05	0.89
1.7	<0.05	1.3	0.13	0.99	0.52	0.53	0.54	<0.05	0.22	0.65	<0.05	<0.05	4.3	2.1	0.06	3.5	1.9	0.89	<0.05	<0.05	<0.05	<0.05	1.4
12.6	<0.8	11.8	0.85	10.2	4.57	4.29	4.27	<0.8	2.96	6.19	<0.8	<0.8	35.2	18.7	<0.8	25.6	19.1	9.05	<0.8	<0.8	<0.8	<0.8	14.4

Assessment of Chemicals of Potential Concern to Human Health

Risk parameter:	**Default - Human Health - residential with home-grown produce (2.5%SOM)**
Client:	Trivallis
Site:	Penrhys Village, Rhondda Cynon Taff
Job no.:	30603
Lab. report no(s).:	24-014999, 24-015003, 24-016507, 24-016568, 24-018446, 24-018448, 24-018451, 24-018460, 24-018462,

Data Filters

Zone	B
Strata	MG
Depth Min (m bgl)	0.2
Depth Max (m bgl)	3.55
Dataset mean SOM%	1.60
Scenario SOM%	2.5

Hydrock

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @2.5% SOM	GAC	GAC Source	Central Limit Theorem Statistical Assessment	02/05/24	30/04/24
														Statistical Assessment?	B	B
															TP102	TP101
															0.5	0.5
															MG	MG
-	**Asbestos**															
P1020	Asbestos Identified	text	Y/N	33	-	-	-	-	No. of detects:	0	-	-	-		N	N
P1889	Asbestos Screen Name	text		0	-	-	-	-	-		-		-			
P1885	Asbestos Quant. (Stage 2)	%	0.001	0					No. > LOD:		-		-			
P1935	Asbestos Quant. Total	%	0.001	0					No. > LOD:		-		-			
P1826	Asbestos Quant. (Stage 3)	%	0.001	0					No. > LOD:		-		-			
-	Asbestos Quant. Total (Stages 2+3)	%	0.001	0					No. > LOD:		-		-			
P1880	Asbestos Containing Material Types Detected (ACM)	text		0	-	-	-	-	-		-		-			
-	**Hydrock Default Suite - FOC / SOM / pH**										-					
P1085	FOC (dimensionless)	[]	0.001	0							-		-			
-	SOM (calculated)	%	0.1724	2	0.90	2.30	1.60	1.60	0.99		-	-	-		2.3	0.9
P1334	pH (su)	pH Units	0.1	2	9.00	9.20	9.10	9.10	0.14		-	-	-		9	9.2
-	**Hydrock Default Suite - Metals & PAH**															
7440-38-2	Arsenic	mg/kg	1	2	6.00	8.00	7.00	7.00	1.41	0	NR	37	C4SL - CL:AIRE 2014	Y	6	8
7440-41-7	Beryllium	mg/kg	0.06	2	0.49	0.56	0.53	0.53	0.05	0	NR	1.7	Hydrock Derived	Y	0.49	0.56
7440-42-8	Boron	mg/kg	0.2	2	0.60	0.70	0.65	0.65	0.07	0	NR	300	Hydrock Derived	Y	0.7	0.6
7440-43-9	Cadmium	mg/kg	0.2	2	0.40	0.50	0.45	0.45	0.07	0	NR	22	C4SL - CL:AIRE 2014	Y	0.4	0.5
16065-83-1	Chromium (III)	mg/kg	1	2	14.00	19.00	16.50	16.50	3.54	0	NR	890	Hydrock Derived	Y	14	19
18540-29-9	Chromium (VI)	mg/kg	1.8	2	1.80	1.80	1.80	1.80	0.00	0	NR	21	C4SL - CL:AIRE 2014	Y	<1.8	<1.8
7440-47-3	Chromium (Total)	mg/kg	1	0										N		
7440-50-8	Copper	mg/kg	1	2	8.00	8.50	8.25	8.25	0.35	0	NR	2500	Hydrock Derived	Y	8	8.5
7439-92-1	Lead	mg/kg	1	2	13.00	19.00	16.00	16.00	4.24	0	NR	200	C4SL - CL:AIRE 2014	Y	13	19
7439-97-6	Mercury, inorganic	mg/kg	0.3	2	0.30	0.30	0.30	0.30	0.00	0	NR	40	Hydrock Derived	Y	<0.3	<0.3
7440-02-0	Nickel	mg/kg	1	2	7.10	13.00	10.05	10.05	4.17	0	NR	130	Hydrock Derived	Y	13	7.1
7782-49-2	Selenium	mg/kg	1	2	1.00	1.30	1.15	1.15	0.21	0	NR	260	Hydrock Derived	Y	1.3	<1
7440-62-2	Vanadium	mg/kg	1	2	17.00	24.00	20.50	20.50	4.95	0	NR	410	Hydrock Derived	Y	17	24
7440-66-6	Zinc	mg/kg	1	2	39.00	68.00	53.50	53.50	20.51	0	NR	3900	Hydrock Derived	Y	68	39
P1095	Cyanide (free)	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020	Y	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	2	1.00	1.00	1.00	1.00	0.00	0	38058	210	Hydrock Derived	Y	<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	2	1.30	15.00	8.15	8.15	9.69	0	141	540	Hydrock Derived	Y	15	1.3
208-96-8	Acenaphthylene	mg/kg	0.05	2	0.12	0.87	0.50	0.50	0.53	0	212	440	Hydrock Derived	Y	0.87	0.12
120-12-7	Anthracene	mg/kg	0.05	2	1.40	16.00	8.70	8.70	10.32	0	2.91	5500	Hydrock Derived	Y	16	1.4
56-55-3	Benz(a)anthracene	mg/kg	0.05	2	6.00	**93.00**	**49.50**	**49.50**	61.52	**1**	4.28	12	Hydrock Derived	Y	93	6
50-32-8	Benzo(a)pyrene	mg/kg	0.05	2	**8.30**	**97.00**	**52.65**	**52.65**	62.72	**2**	2.28	5	C4SL - CL:AIRE 2014	Y	97	8.3
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	2	**11.00**	**130.00**	**70.50**	**70.50**	84.15	**2**	3.04	3.3	Hydrock Derived	Y	130	11
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	2	6.10	37.00	21.55	21.55	21.85	0	0.04	340	Hydrock Derived	Y	37	6.1
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	2	4.10	47.00	25.55	25.55	30.33	0	1.72	93	Hydrock Derived	Y	47	4.1
218-01-9	Chrysene	mg/kg	0.05	2	6.80	**100.00**	**53.40**	**53.40**	65.90	**1**	1.10	22	Hydrock Derived	Y	100	6.8
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	2	0.05	**14.00**	**7.03**	**7.03**	9.86	**1**	0.010	0.29	Hydrock Derived	Y	14	<0.05
206-44-0	Fluoranthene	mg/kg	0.05	2	11.00	120.00	65.50	65.50	77.07	0	47	560	Hydrock Derived	Y	120	11
86-73-7	Fluorene	mg/kg	0.05	2	0.93	11.00	5.97	5.97	7.12	0	77	420	Hydrock Derived	Y	11	0.93
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	2	5.20	**38.00**	21.60	21.60	23.19	**1**	0.15	36	Hydrock Derived	Y	38	5.2
91-20-3	Naphthalene	mg/kg	0.05	2	0.05	0.66	0.36	0.36	0.43	0	183	30	Hydrock Derived	Y	0.66	<0.05
85-01-8	Phenanthrene	mg/kg	0.05	2	5.60	54.00	29.80	29.80	34.22	0	90	220	Hydrock Derived	Y	54	5.6
129-00-0	Pyrene	mg/kg	0.05	2	9.00	90.00	49.50	49.50	57.28	0	5.5	1200	Hydrock Derived	Y	90	9
P1310	PAH 16 Total	mg/kg	0.8	2	76.50	86.30	81.40	81.40	6.93			-		N	86.3	76.5

Phytotoxic GQRA

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	**Phytotoxic pH >7**
Client:	Trivallis
Site:	Penrhys Village, Rhondda Cynon Taff
Job no.:	30603
Lab. report no(s).:	24-014999, 24-015003, 24-016507, 24-016568, 24-018446, 24-018448, 24-018451, 24-018460, 24-018462, 24-018472, 24-018668,

Data Filters

Zone	**All**
Strata	**All**
Depth Min (m bgl)	**0.2**
Depth Max (m bgl)	**3.55**
Dataset mean pH	**8.84**
Scenario pH	**>7**

Hydrock

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Strata	16/04/24	16/04/24	15/04/24	15/04/24	18/04/24	23/04/24	22/04/24	23/04/24	23/04/24	23/04/24	01/05/24	01/05/24	01/05/24	01/05/24	30/04/24	30/04/24	01/05/24	30/04/24	07/05/24	07/05/24	07/05/24
													Zone	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	C	C	C
													Location	BH301	BH301	BH301	BH301	BH306	BH302B	TP202	TP204	TP204	TP210	TP203	TP207A	TP207A	TP208	BH305	BH305	BH305	TP216	BH307	TP218	TP219
													Depth (bgl)	1.85	3.55	0.6	1.1	0.6	1.1	0.5	0.5	2	2.5	0.5	0.5	1.5	1	0.2	1	2.55	0.5	0.2	0.5	1
-	**Hydrock Default Suite - FOC / SOM / pH**																																
P1334	pH (su)	pH Units	0.1	41	6.10	12.30	8.84	8.20	1.57		-	-		8.1	7.7	11.4	10.8	7.4	11.2	8.5	11.3	8.9	8.1	9.6	11.1	11.6	8.2	7.6	9.7	9.2	8.1	7.5	7	7.1
-	**Hydrock Default Suite - Metals & PAH**																																
7440-38-2	Arsenic	mg/kg	1	33	6.00	37.00	14.04	13.00	6.93	0	250	MAFF 1998		-	8.7	-	12	10	37	11	33	23	14	13	9.4	-	11	12	11	-	6.1	23	6.4	15
7440-42-8	Boron	mg/kg	0.2	33	0.20	1.80	0.40	0.20	0.41	0	5	Nable, et al. 1997		-	<0.2	-	1	0.2	0.5	0.2	1.8	1.1	<0.2	0.4	<0.2	-	0.3	<0.2	<0.2	-	0.2	<0.2	<0.2	0.2
16065-83-1	Chromium (III)	mg/kg	1	33	14.00	38.00	19.94	17.00	6.76	0	400	MAFF 1998 (Cr(T))		-	16	-	15	16	38	14	37	30	15	22	15	-	15	20	16	-	28	20	24	21
18540-29-9	Chromium (VI)	mg/kg	1.8	33	1.80	1.80	1.80	1.80	0.00	0	25	ICRCL 70/90 1990		-	<1.8	-	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	-	<1.8	<1.8	<1.8	-	<1.8	<1.8	<1.8	<1.8
7440-50-8	Copper	mg/kg	1	33	5.20	61.00	21.06	18.00	12.37	0	200	BS3882 2015		-	5.2	-	13	15	45	8.6	50	30	9.7	24	18	-	21	20	18	-	12	22	27	22
7440-02-0	Nickel	mg/kg	1	33	7.10	42.00	20.12	19.00	9.14	0	110	BS3882 2015		-	42	-	10	20	12	8.6	19	23	23	12	9.7	-	16	21	17	-	29	13	37	31
7440-66-6	Zinc	mg/kg	1	33	37.00	280.00	87.94	74.00	54.22	0	300	BS3882 2015		-	74	-	78	69	280	47	200	170	53	54	100	-	61	100	77	-	37	73	76	95

Legend:

MG	Made Ground
RM	Rhondda Member
TS	Topsoil

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

Template Version:

1.09: 11/03/24

Assessment of Chemicals of Potential Concern to Plant Life

Risk parameter:	**Phytotoxic pH >7**
Client:	Trivallis
Site:	Penrhys Village, Rhondda Cynon Taff
Job no.:	30603
Lab. report no(s).:	24-014999, 24-015003, 24-016507, 24-016568, 24-018446, 24-018448, 24-018451, 24-018460, 24-018462, 24-018472, 24-018668,

Data Filters

Zone	**All**
Strata	**All**
Depth Min (m bgl)	**0.2**
Depth Max (m bgl)	**3.55**
Dataset mean pH	**8.84**
Scenario pH	**>7**

Hydrock

ng/kg unless otherwise stated

Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	25/04/24	25/04/24	26/04/24	25/04/24	25/04/24	25/04/24	25/04/24	02/05/24	02/05/24	02/05/24	02/05/24	29/04/24	29/04/24	29/04/24	29/04/24	29/04/24	29/04/24	08/05/24	30/04/24	30/04/24
												A	A	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	C	A	B
												TP205	TP205	TP213	TP217B	BH304	BH304	BH304	TP102	BH303B	BH303B	BH303B	TP206A	TP211	TP212	TP212	TP214	TP214	BH307	TP215	TP101
												1.5	2	1.5	1	0.2	0.6	1	0.5	0.2	0.6	1.1	0.5	1.5	1	2	0.5	2.5	0.95	0.5	0.5
												MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	RM	MG	RM	MG	MG	RM	MG	MG
Hydrock Default Suite - FOC / SOM / pH																															
pH (su)	pH Units	0.1	41	6.10	12.30	8.84	8.20	1.57		-	-	10.5	10.4	8.5	8.3	7.9	8.2	8.2	9	8.5	11.7	12.3	8.1	7.9	8	8	6.5	7.1	6.1	8	9.2
Hydrock Default Suite - Metals & PAH																															
Arsenic	mg/kg	1	33	6.00	37.00	14.04	13.00	6.93	0	250	MAFF 1998	13	-	14	14	24	-	8.8	6	16	-	12	12	11	13	13	13	-	13	17	8
Boron	mg/kg	0.2	33	0.20	1.80	0.40	0.20	0.41	0	5	Nable, et al. 1997	1.6	-	<0.2	<0.2	0.5	-	<0.2	0.7	0.3	-	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	0.6
Chromium (III)	mg/kg	1	33	14.00	38.00	19.94	17.00	6.76	0	400	MAFF 1998 (Cr(T))	17	-	19	19	37	-	16	14	16	-	19	15	16	17	16	19	-	23	14	19
Chromium (VI)	mg/kg	1.8	33	1.80	1.80	1.80	1.80	0.00	0	25	ICRCL 70/90 1990	<1.8	-	<1.8	<1.8	<1.8	-	<1.8	<1.8	<1.8	-	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	-	<1.8	<1.8	<1.8
Copper	mg/kg	1	33	5.20	61.00	21.06	18.00	12.37	0	200	BS3882 2015	22	-	36	19	61	-	15	8	33	-	15	12	13	18	21	15	-	24	14	8.5
Nickel	mg/kg	1	33	7.10	42.00	20.12	19.00	9.14	0	110	BS3882 2015	9.5	-	23	24	23	-	24	13	19	-	9.9	15	23	19	30	30	-	39	12	7.1
Zinc	mg/kg	1	33	37.00	280.00	87.94	74.00	54.22	0	300	BS3882 2015	78	-	86	73	230	-	63	68	97	-	74	52	61	65	67	76	-	82	47	39

Legend:

MG	Made Ground
RM	Rhondda Member
TS	Topsoil

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

sion:

Controlled waters GQRA

Summary of Remedial Targets Methodology Screening

Hydrock

Hydrock Scenario: Scenario B - EQS (inland)
RTM Level: RTM Level 1 - Soil Zone Assessment - leachate samples
Water body receptor(s): Groundwater
Secondary receptor(s):
Data set: Leachate
Client: Trivallis
Site: Penrhys Village, Rhondda Cynon Taff
Job no: C30603
Test Certificates(s): 24-016568, 24-018446, 24-018448, 24-018460, 24-018462, 24-018472, 24-018668
Dataset ALL ZONES

PNEC calculated (inland EQS)

2013/39/EU Annex I
P = priority substance
PH = priority hazardous substances.
WFD Designation (2015 Directions)
OP = Other substance identical to previous legislation
SP = Specific Pollutant

JAGDAG Hazardous Substances Determination (UK)
H Hazardous substance
NP Non-hazardous pollutant
(blank) Not included in assessment

CAS / AGS Number	Chemicals of Potential Concern (concentrations in µg/l)	WFD Designation	Hazardous Substance Status	Summary of Sample Data						Value Being Compared to Target = Maximum Value	Water Quality Target (Exceeded if Red)		No. Samples Exceeding Water Quality Target		No. Samples above LoD Exceeding Water Quality		Notes
				No. of Samples	No. of Samples > LoD	Limit of Detection	Minimum Value	Maximum Value	95-%ile Value			Inland Waters EQS		Inland Waters EQS		Inland Waters EQS	EQS compared to dissolved metals as an initial screen, with no adjustment for bioavailability or ABC.
P1133	Hardness as mg/l $CaCO_3$			-	-	-	10	-	-	-		-					Representative hardness of receiving surface water environment used in some inland EQS
7440-22-4	Silver (Ag) (dissolved)			12	0	1	0.9	0.999	0.999	0.999		0.05		12		0	Limit of Dectection
7429-90-5	Aluminium (Al) (dissolved)			12	12	12	24	1300	1052.5	1300		n/a					
7440-38-2	Arsenic (As) (dissolved)	SP	H	12	8	1	0.99	9.1	7.175	9.1		50		0		0	
7440-42-8	Boron (B) (dissolved)		NP	12	2	10	9.9	62	50.45	62		2000		0		0	
7440-39-3	Barium (Ba) (dissolved)			12	12	0.05	0.35	27	24.8	27		n/a					
7440-43-9	Cadmium (Cd) (dissolved)	PH	NP	12	0	0.08	0.079	0.0799	0.0799	0.0799		0.08		0		0	EQS (inland) dependent on hardness of receiving surface water environment
7440-48-4	Cobalt (Co) (dissolved)		NP	12	0	0.3	0.29	0.29999	0.299941	0.29999		3		0		0	
18540-29-9	Chromium (VI) (Cr) (dissolved)	SP	H	12	0	5	4.9	4.99	4.99	4.99		3.4		12		0	Limit of Dectection
16065-83-1	Chromium (III) (Cr) (dissolved)	SP		12	0	5	4.9	4.99	4.99	4.99		4.7		12		0	Limit of Dectection
7440-47-3	Chromium (Cr) (total) (dissolved)			12	10	0.4	0.399	4.3	3.035	4.3		n/a					
7440-50-8	Copper (Cu) (dissolved)	SP	NP	12	12	0.7	1.3	36	35.45	36		1		12		12	Bioavailable EQS (inland)
7439-89-6	Iron (Fe) (dissolved)	SP		12	11	0.004	0.00399	1.1	0.8305	1.1		1000		0		0	
7439-97-6	Mercury (Hg) (dissolved)	PH	H	12	1	0.007	0.0069	0.0209	0.01325	0.0209		0.07		0		0	
P1286	Manganese (Mn) (dissolved)	SP		12	12	0.06	8.2	190	119.05	190		123		1		1	Bioavailable EQS (inland)
7440-23-5	Sodium (Na) (dissolved)			12	12	0.01	0.77	6.2	4.66	6.2		n/a					
7440-02-0	Nickel (Ni) (dissolved)	*P*	NP	12	8	0.3	0.29	3.9	3.68	3.9		4		0		0	Bioavailable EQS (inland)
7439-92-1	Lead (Pb) (dissolved)	*P*	H	12	4	1	0.98	2.5	2.17	2.5		1.2		3		3	Bioavailable EQS (inland)
7440-36-0	Antimony (Sb) (dissolved)		NP	12	0	1.7	1.69	1.6999	1.6999	1.6999		n/a					
7782-49-2	Selenium (Se) (dissolved)		NP	12	1	4	3.9	4.4	4.17945	4.4		n/a					
7440-31-5	Tin (Sn) (dissolved)			0								25					
7440-62-2	Vanadium (V) (dissolved)			12	4	1.7	1.69	57	27.355	57		20		1		1	EQS (inland) dependent on hardness of receiving surface water environment
7440-66-6	Zinc (Zn) (dissolved)	SP	NP	0								12.3					Bioavailable EQS (inland) + ambient background concentration (ABC)
P1095	Cyanide (free) (hydrogen cyanide)	SP	NP	12	0	1	0.99	0.999	0.999	0.999		1		0		0	
57-12-5	Cyanide (total)			12	0	1	0.99	0.999	0.999	0.999		n/a					
P1140	Ammonium (NH_4^+)		NP	12	12	15	22	150	120.85	150		n/a					
P1238	Ammoniacal Nitrogen (as N)		NP	0								300					
P1720	Ammonia (unionised) (NH_3 as N) (free ammonia)	SP	NP	0								n/a					
15541-45-4	Bromate (BrO_3^-)			12	0	0.002	0.0019	0.00199	0.00199	0.00199		n/a					
16887-00-6	Chloride (Cl^-)			12	11	0.15	0.149	5.1	3.23	5.1		250000		0		0	
16984-48-8	Fluoride (F^-)			12	10	50	49.9	320	314.5	320		1000		0		0	EQS (inland) dependent on hardness of receiving surface water environment
P1348	Nitrate (NO_3^-)			12	6	0.05	0.049	1.25	1.1345	1.25		n/a					
P1349	Nitrite (NO_2^-)			12	6	5	4.9	25	22.25	25		n/a					
14808-79-8	Sulfate (SO_4^{2-})			12	12	0	1.13	107	88.85	107		400000		0		0	
P1134	pH (min.) (su)			0								6					
P1134	pH (max.) (su)			12	12	0	7.3	10.3	9.2	10.3		9		1		1	
P1287	Electrical conductivity (µS/cm)			12	11	10	9.99	290	268	290		n/a					
120-12-7	Anthracene	PH	H	12	1	0.01	0.009	0.09	0.045945	0.09		0.1		0		0	
50-32-8	Benzo(a)pyrene	PH	H	12	0	0.01	0.009	0.00999	0.00999	0.00999		0.00017		12		0	Benzo(a)pyrene EQS used as marker substance for the group of benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene & indeno (1,2,3-cd)pyrene
206-44-0	Fluoranthene	*P*	H	12	1	0.01	0.009	0.23	0.108945	0.23		0.0063		12		1	
91-20-3	Naphthalene	*P*	NP	12	2	0.01	0.009	0.12	0.109	0.12		2		0		0	
GRP01	PAHs = sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene	*P*	H	12	2	0.16	0.159	1.76	0.9405	1.76		n/a					
P1877	Phenol	SP	NP	12	10	1	0.99	2.6	2.545	2.6		7.7		0		0	

Appendix F Waste assessment

HazWasteOnline™ assessment

Waste Classification Report

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

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

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

RBFS3-MJIJ5-2SPB9

Job name

Penrhys Village

Description/Comments

Project

30603-GSWC

Site

Penrhys Village

Classified by

Name:
Kurt Gilmore
Company:
Hydrock Consultants Ltd
Date:
19 Jun 2024 15:04 GMT
Telephone:

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:	-
Course	**Date**
Hazardous Waste Classification	08 Sep 2020
3 year Refresher overdue	-

Purpose of classification

2 - Material Characterisation

Address of the waste

enrhys Village, Rhondda Cynon Taff, Penrhys Road, Penrhys, Ferndale **Post Code** CF43 3RN

SIC for the process giving rise to the waste

43110 Demolition

Description of industry/producer giving rise to the waste

Site Investigation prior to demolition of residential houses

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

Site Investigation

Description of the waste

Made ground

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH301	1.85	Non Hazardous		3
2	BH301[2]	3.55	Non Hazardous		4
3	BH301[3]	0.6	Non Hazardous		6
4	BH301[4]	1.1	Non Hazardous		7
5	BH306	0.6	Non Hazardous		9
6	BH302B	1.1	Non Hazardous		11
7	TP202	0.5	Non Hazardous		13
8	TP204	0.5	Non Hazardous		15
9	TP204[2]	2	Non Hazardous		17
10	TP210	2.5	Non Hazardous		19
11	TP203	0.5	Non Hazardous		21
12	TP207A	0.5	Non Hazardous		23
13	TP207A[2]	1.5	Hazardous	HP 8	25
14	TP208	1	Non Hazardous		26
15	BH305	0.2	Non Hazardous		28
16	BH305[2]	1	Non Hazardous		30
17	BH305[3]	2.55	Non Hazardous		32
18	TP216	0.5	Non Hazardous		33
19	BH307	0.2	Non Hazardous		35
20	TP218	0.5	Non Hazardous		37
21	TP219	1	Non Hazardous		39
22	TP205	1.5	Non Hazardous		41
23	TP205[2]	2	Non Hazardous		43
24	TP213	1.5	Non Hazardous		44
25	TP217B	1	Non Hazardous		46
26	BH304	0.2	Non Hazardous		48
27	BH304[2]	0.6	Non Hazardous		50
28	BH304[3]	1	Non Hazardous		51
29	TP102	0.5	Non Hazardous		53
30	BH303B	0.2	Non Hazardous		55
31	BH303B[2]	0.6	Hazardous	HP 8	57
32	BH303B[3]	1.1	Hazardous	HP 8	58
33	TP206A	0.5	Non Hazardous		60
34	TP211	1.5	Non Hazardous		62
35	TP212	1	Non Hazardous		64
36	TP212[2]	2	Non Hazardous		66
37	TP214	0.5	Non Hazardous		68
38	TP214[2]	2.5	Non Hazardous		70
39	BH307[2]	0.95	Non Hazardous		71
40	TP215	0.5	Non Hazardous		73
41	TP101	0.5	Non Hazardous		75

Related documents

#	Name	Description
1	Hydrock Standard plus Cresol (ammended Lead)	waste stream template used to create this Job

Report

Created by: Kurt Gilmore

Created date: 19 Jun 2024 15:04 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	77
Appendix B: Rationale for selection of metal species	78
Appendix C: Version	79

Classification of sample: BH301

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

Sample details

Sample name:	LoW Code:	
BH301	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.85 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		8.1 pH		8.1 pH	8.1 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH301[2]

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

Sample details

Sample name:
BH301[2]
Sample Depth:
3.55 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	11.487 mg/kg	0.00115 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6 mg/kg	2.775	4.441 mg/kg	0.000444 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				5.2	mg/kg	1.126	5.855	mg/kg	0.000585 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	2.8	mg/kg		2.8	mg/kg	0.00028 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				42	mg/kg	1.579	66.339	mg/kg	0.00663 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				74	mg/kg	1.245	92.109	mg/kg	0.00921 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0217 %		

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: BH301[3]

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

Sample details

Sample name:
BH301[3]
Sample Depth:
0.6 m

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: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		11.4 pH		11.4 pH	11.4 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH301[4]

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

Sample details

Sample name:	LoW Code:	
BH301[4]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.1 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.18 mg/kg		0.18 mg/kg	0.000018 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		**<LOD**
3	anthracene		204-371-1	120-12-7		0.36 mg/kg		0.36 mg/kg	0.000036 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.1 mg/kg		1.1 mg/kg	0.00011 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1 mg/kg		1 mg/kg	0.0001 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.4 mg/kg		1.4 mg/kg	0.00014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.64 mg/kg		0.64 mg/kg	0.000064 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.67 mg/kg		0.67 mg/kg	0.000067 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.69 mg/kg	2.775	1.915 mg/kg	0.000191 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1 mg/kg	13.43	13.43 mg/kg	0.00134 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4 mg/kg	1.285	0.514 mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		**<LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.3 mg/kg		1.3 mg/kg	0.00013 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.19	mg/kg		0.19	mg/kg	0.000019 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				2	mg/kg		2	mg/kg	0.0002 %		
			205-912-4	206-44-0									
20		fluorene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.54	mg/kg		0.54	mg/kg	0.000054 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	72	mg/kg		72	mg/kg	0.0072 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				10	mg/kg	1.579	15.795	mg/kg	0.00158 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				10.8	pH		10.8	pH	10.8 pH		
				PH									
27		phenanthrene				1.2	mg/kg		1.2	mg/kg	0.00012 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				1.7	mg/kg		1.7	mg/kg	0.00017 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				78	mg/kg	1.245	97.088	mg/kg	0.00971 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0272 %		

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: BH306

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

Sample details

Sample name:	LoW Code:	
BH306	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.6 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		10 mg/kg	1.32	13.203 mg/kg	0.00132 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.47 mg/kg	2.775	1.304 mg/kg	0.00013 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2 mg/kg	13.43	2.686 mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	12	mg/kg		12	mg/kg	0.0012 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				20	mg/kg	1.579	31.59	mg/kg	0.00316 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.4	pH		7.4	pH	7.4 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				69	mg/kg	1.245	85.885	mg/kg	0.00859 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0195 %		

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: BH302B

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

Sample details

Sample name:		LoW Code:	
BH302B		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.18	mg/kg		0.18	mg/kg	0.000018 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		37	mg/kg	1.32	48.852	mg/kg	0.00489 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		1.2	mg/kg	0.00012 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.3	mg/kg		1.3	mg/kg	0.00013 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.8	mg/kg		1.8	mg/kg	0.00018 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.73	mg/kg		0.73	mg/kg	0.000073 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.63	mg/kg		0.63	mg/kg	0.000063 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41	mg/kg	2.775	1.138	mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5	mg/kg	13.43	6.715	mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		38	mg/kg	1.462	55.539	mg/kg	0.00555 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.4	mg/kg		1.4	mg/kg	0.00014 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		45	mg/kg	1.126	50.665	mg/kg	0.00507 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.22	mg/kg		0.22	mg/kg	0.000022 %		
19		fluoranthene		205-912-4	206-44-0		1.6	mg/kg		1.6	mg/kg	0.00016 %		
20		fluorene		201-695-5	86-73-7		0.09	mg/kg		0.09	mg/kg	0.000009 %		
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.69	mg/kg		0.69	mg/kg	0.000069 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	110	mg/kg		110	mg/kg	0.011 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
26		pH			PH		11.2	pH		11.2	pH	11.2 pH		
27		phenanthrene		201-581-5	85-01-8		0.64	mg/kg		0.64	mg/kg	0.000064 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		1.3	mg/kg		1.3	mg/kg	0.00013 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		280	mg/kg	1.245	348.52	mg/kg	0.0349 %		
											Total:	0.0659 %		

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: TP202

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

Sample details

Sample name:	LoW Code:	
TP202	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.07 mg/kg		0.07 mg/kg	0.000007 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.07 mg/kg		0.07 mg/kg	0.000007 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41 mg/kg	2.775	1.138 mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2 mg/kg	13.43	2.686 mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.13 mg/kg		0.13 mg/kg	0.000013 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.6	mg/kg	1.126	9.683	mg/kg	0.000968 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.22	mg/kg		0.22	mg/kg	0.000022 %		
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	12	mg/kg		12	mg/kg	0.0012 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		8.6	mg/kg	1.579	13.584	mg/kg	0.00136 %		
26		pH			PH		8.5	pH		8.5	pH	8.5 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		0.13	mg/kg		0.13	mg/kg	0.000013 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		47	mg/kg	1.245	58.502	mg/kg	0.00585 %		
											Total:	0.0141 %		

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: TP204

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

Sample details

Sample name:
TP204
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.12 mg/kg		0.12 mg/kg	0.000012 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.2 mg/kg		0.2 mg/kg	0.00002 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		33 mg/kg	1.32	43.571 mg/kg	0.00436 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.91 mg/kg		0.91 mg/kg	0.000091 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.99 mg/kg		0.99 mg/kg	0.000099 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.5 mg/kg		1.5 mg/kg	0.00015 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.61 mg/kg		0.61 mg/kg	0.000061 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.53 mg/kg		0.53 mg/kg	0.000053 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.57 mg/kg	2.775	1.582 mg/kg	0.000158 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.8 mg/kg	13.43	24.174 mg/kg	0.00242 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37 mg/kg	1.462	54.078 mg/kg	0.00541 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.1 mg/kg		1.1 mg/kg	0.00011 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		50	mg/kg	1.126	56.294	mg/kg	0.00563 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.21	mg/kg		0.21	mg/kg	0.000021 %		
19		fluoranthene		205-912-4	206-44-0		1.4	mg/kg		1.4	mg/kg	0.00014 %		
20		fluorene		201-695-5	86-73-7		0.12	mg/kg		0.12	mg/kg	0.000012 %		
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.61	mg/kg		0.61	mg/kg	0.000061 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	69	mg/kg		69	mg/kg	0.0069 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		19	mg/kg	1.579	30.01	mg/kg	0.003 %		
26		pH			PH		11.3	pH		11.3	pH	11.3 pH		
27		phenanthrene		201-581-5	85-01-8		0.94	mg/kg		0.94	mg/kg	0.000094 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		0.99	mg/kg		0.99	mg/kg	0.000099 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		200	mg/kg	1.245	248.943	mg/kg	0.0249 %		
											Total:	0.0545 %		

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: TP204[2]

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

Sample details

Sample name:		LoW Code:	
TP204[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
2 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.07 mg/kg		0.07 mg/kg	0.000007 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.06 mg/kg		0.06 mg/kg	0.000006 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23 mg/kg	1.32	30.367 mg/kg	0.00304 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.46 mg/kg		0.46 mg/kg	0.000046 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.75 mg/kg		0.75 mg/kg	0.000075 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.34 mg/kg		0.34 mg/kg	0.000034 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.28 mg/kg		0.28 mg/kg	0.000028 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.68 mg/kg	2.775	1.887 mg/kg	0.000189 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.1 mg/kg	13.43	14.773 mg/kg	0.00148 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		30 mg/kg	1.462	43.847 mg/kg	0.00438 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.59 mg/kg		0.59 mg/kg	0.000059 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				30	mg/kg	1.126	33.777	mg/kg	0.00338 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.63	mg/kg		0.63	mg/kg	0.000063 %		
			205-912-4	206-44-0									
20		fluorene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.33	mg/kg		0.33	mg/kg	0.000033 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	28	mg/kg		28	mg/kg	0.0028 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.9	pH		8.9	pH	8.9 pH		
				PH									
27		phenanthrene				0.38	mg/kg		0.38	mg/kg	0.000038 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.52	mg/kg		0.52	mg/kg	0.000052 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				170	mg/kg	1.245	211.601	mg/kg	0.0212 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0412 %		

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: TP210

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

Sample details

Sample name:	LoW Code:	
TP210	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
2.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	18.485 mg/kg	0.00185 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.43 mg/kg		0.43 mg/kg	0.000043 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.8 mg/kg		0.8 mg/kg	0.00008 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.34 mg/kg		0.34 mg/kg	0.000034 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.32 mg/kg		0.32 mg/kg	0.000032 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.6 mg/kg	2.775	1.665 mg/kg	0.000167 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.57 mg/kg		0.57 mg/kg	0.000057 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				9.7	mg/kg	1.126	10.921	mg/kg	0.00109 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.37	mg/kg		0.37	mg/kg	0.000037 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13	mg/kg		13	mg/kg	0.0013 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
27		phenanthrene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.53	mg/kg		0.53	mg/kg	0.000053 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				53	mg/kg	1.245	65.97	mg/kg	0.0066 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0183 %		

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: TP203

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

Sample details

Sample name:
TP203
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.14 mg/kg		0.14 mg/kg	0.000014 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.33 mg/kg		0.33 mg/kg	0.000033 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.34 mg/kg		0.34 mg/kg	0.000034 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.5 mg/kg		0.5 mg/kg	0.00005 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.25 mg/kg		0.25 mg/kg	0.000025 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.15 mg/kg		0.15 mg/kg	0.000015 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.39 mg/kg	2.775	1.082 mg/kg	0.000108 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.4 mg/kg	13.43	5.372 mg/kg	0.000537 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.41 mg/kg		0.41 mg/kg	0.000041 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	27.021	mg/kg	0.0027 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.61	mg/kg		0.61	mg/kg	0.000061 %		
			205-912-4	206-44-0									
20		fluorene				0.2	mg/kg		0.2	mg/kg	0.00002 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.6	pH		9.6	pH	9.6 pH		
				PH									
27		phenanthrene				0.58	mg/kg		0.58	mg/kg	0.000058 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.54	mg/kg		0.54	mg/kg	0.000054 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				54	mg/kg	1.245	67.215	mg/kg	0.00672 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.02 %		

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: TP207A

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

Sample details

Sample name:
TP207A
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4 mg/kg	1.32	12.411 mg/kg	0.00124 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08 mg/kg		0.08 mg/kg	0.000008 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.08 mg/kg		0.08 mg/kg	0.000008 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.09 mg/kg		0.09 mg/kg	0.000009 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45 mg/kg	2.775	1.249 mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				9.7	mg/kg	1.579	15.321	mg/kg	0.00153 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				11.1	pH		11.1	pH	11.1 pH		
				PH									
27		phenanthrene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				100	mg/kg	1.245	124.471	mg/kg	0.0124 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0227 %		

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: TP207A[2]

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP207A[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.5 m	Entry:	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.6 pH)

Determinands

Moisture content: 0% No 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				11.6 pH		11.6 pH	11.6 pH		
				PH							
								Total:	0%		

Key

	User supplied data
	Hazardous result
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: TP208

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

Sample details

Sample name:
TP208
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.23 mg/kg		0.23 mg/kg	0.000023 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.41 mg/kg		0.41 mg/kg	0.000041 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.6 mg/kg		0.6 mg/kg	0.00006 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.3 mg/kg		0.3 mg/kg	0.00003 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.19 mg/kg		0.19 mg/kg	0.000019 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.57 mg/kg	2.775	1.582 mg/kg	0.000158 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3 mg/kg	13.43	4.029 mg/kg	0.000403 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.3 mg/kg	1.285	0.386 mg/kg	0.00003 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.37 mg/kg		0.37 mg/kg	0.000037 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.28	mg/kg		0.28	mg/kg	0.000028 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		16	mg/kg	0.0016 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				16	mg/kg	1.579	25.272	mg/kg	0.00253 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				61	mg/kg	1.245	75.928	mg/kg	0.00759 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0193 %		

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: BH305

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

Sample details

Sample name:
BH305
Sample Depth:
0.2 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		0.07 mg/kg		0.07 mg/kg	0.000007 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.58 mg/kg		0.58 mg/kg	0.000058 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.65 mg/kg		0.65 mg/kg	0.000065 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.96 mg/kg		0.96 mg/kg	0.000096 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.51 mg/kg		0.51 mg/kg	0.000051 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.35 mg/kg		0.35 mg/kg	0.000035 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.75 mg/kg	2.775	2.082 mg/kg	0.000208 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4 mg/kg	1.285	0.514 mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	29.231 mg/kg	0.00292 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.78 mg/kg		0.78 mg/kg	0.000078 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				20	mg/kg	1.126	22.518	mg/kg	0.00225 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.8	mg/kg		0.8	mg/kg	0.00008 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.49	mg/kg		0.49	mg/kg	0.000049 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	27	mg/kg		27	mg/kg	0.0027 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				21	mg/kg	1.579	33.169	mg/kg	0.00332 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.6	pH		7.6	pH	7.6 pH		
				PH									
27		phenanthrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.65	mg/kg		0.65	mg/kg	0.000065 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				100	mg/kg	1.245	124.471	mg/kg	0.0124 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0271 %		

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: BH305[2]

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

Sample details

Sample name:
BH305[2]
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.65 mg/kg	2.775	1.804 mg/kg	0.00018 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	18	mg/kg		18	mg/kg	0.0018 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				17	mg/kg	1.579	26.851	mg/kg	0.00269 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.7	pH		9.7	pH	9.7 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				77	mg/kg	1.245	95.843	mg/kg	0.00958 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0211 %		

Key

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

Classification of sample: BH305[3]

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

Sample details

Sample name:	LoW Code:	
BH305[3]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
2.55 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1		pH		PH		9.2 pH		9.2 pH	9.2 pH		
								Total:	0%		

Key

	User supplied data
	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: TP216

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

Sample details

Sample name:	LoW Code:	
TP216	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.1	mg/kg	1.32	8.054	mg/kg	0.000805 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.7	mg/kg	2.775	1.943	mg/kg	0.000194 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2	mg/kg	13.43	2.686	mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		28	mg/kg	1.462	40.924	mg/kg	0.00409 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	9.1	mg/kg		9.1	mg/kg	0.00091 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				29	mg/kg	1.579	45.805	mg/kg	0.00458 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				37	mg/kg	1.245	46.054	mg/kg	0.00461 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0176 %		

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: BH307

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

Sample details

Sample name:
BH307
Sample Depth:
0.2 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23 mg/kg	1.32	30.367 mg/kg	0.00304 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.15 mg/kg		0.15 mg/kg	0.000015 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.2 mg/kg		0.2 mg/kg	0.00002 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.27 mg/kg		0.27 mg/kg	0.000027 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.15 mg/kg		0.15 mg/kg	0.000015 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.46 mg/kg	2.775	1.277 mg/kg	0.000128 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		20 mg/kg	1.462	29.231 mg/kg	0.00292 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.23 mg/kg		0.23 mg/kg	0.000023 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	44	mg/kg		44	mg/kg	0.0044 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.05	mg/kg		0.05	mg/kg	0.000005 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				13	mg/kg	1.579	20.533	mg/kg	0.00205 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.5	pH		7.5	pH	7.5 pH		
				PH									
27		phenanthrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.18	mg/kg		0.18	mg/kg	0.000018 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				73	mg/kg	1.245	90.864	mg/kg	0.00909 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0253 %		

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: TP218

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

Sample details

Sample name:	LoW Code:	
TP218	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.4 mg/kg	1.32	8.45 mg/kg	0.000845 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.3 mg/kg	2.775	3.608 mg/kg	0.000361 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		24 mg/kg	1.462	35.077 mg/kg	0.00351 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27	mg/kg	1.126	30.399	mg/kg	0.00304 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	11	mg/kg		11	mg/kg	0.0011 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		37	mg/kg	1.579	58.441	mg/kg	0.00584 %		
26		pH			PH		7	pH		7	pH	7pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		76	mg/kg	1.245	94.598	mg/kg	0.00946 %		
											Total:	0.0252 %		

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: TP219

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

Sample details

Sample name:	LoW Code:	
TP219	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	19.805 mg/kg	0.00198 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.09 mg/kg		0.09 mg/kg	0.000009 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.86 mg/kg	2.775	2.387 mg/kg	0.000239 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2 mg/kg	13.43	2.686 mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21 mg/kg	1.462	30.693 mg/kg	0.00307 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	21	mg/kg		21	mg/kg	0.0021 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				31	mg/kg	1.579	48.964	mg/kg	0.0049 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.1	pH		7.1	pH	7.1 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				95	mg/kg	1.245	118.248	mg/kg	0.0118 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0276 %		

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: TP205

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

Sample details

Sample name:	LoW Code:	
TP205	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.66 mg/kg		0.66 mg/kg	0.000066 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.96 mg/kg		0.96 mg/kg	0.000096 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		3 mg/kg		3 mg/kg	0.0003 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2.9 mg/kg		2.9 mg/kg	0.00029 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		4.2 mg/kg		4.2 mg/kg	0.00042 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		1.6 mg/kg		1.6 mg/kg	0.00016 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.3 mg/kg		1.3 mg/kg	0.00013 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45 mg/kg	2.775	1.249 mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.6 mg/kg	13.43	21.488 mg/kg	0.00215 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		3.5 mg/kg		3.5 mg/kg	0.00035 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	24.77	mg/kg	0.00248 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.75	mg/kg		0.75	mg/kg	0.000075 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				5.8	mg/kg		5.8	mg/kg	0.00058 %		
			205-912-4	206-44-0									
20		fluorene				0.69	mg/kg		0.69	mg/kg	0.000069 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				9.5	mg/kg	1.579	15.005	mg/kg	0.0015 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				10.5	pH		10.5	pH	10.5 pH		
				PH									
27		phenanthrene				4	mg/kg		4	mg/kg	0.0004 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				4.3	mg/kg		4.3	mg/kg	0.00043 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				78	mg/kg	1.245	97.088	mg/kg	0.00971 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0264 %		

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: TP205[2]

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

Sample details

Sample name:	LoW Code:	
TP205[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		10.4 pH		10.4 pH	10.4 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: TP213

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

Sample details

Sample name:
TP213
Sample Depth:
1.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.3 mg/kg		0.3 mg/kg	0.00003 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		0.15 mg/kg		0.15 mg/kg	0.000015 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	18.485 mg/kg	0.00185 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.4 mg/kg		1.4 mg/kg	0.00014 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.8 mg/kg		1.8 mg/kg	0.00018 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.7 mg/kg		2.7 mg/kg	0.00027 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		1.5 mg/kg		1.5 mg/kg	0.00015 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1 mg/kg		1 mg/kg	0.0001 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.87 mg/kg	2.775	2.415 mg/kg	0.000241 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		2 mg/kg		2 mg/kg	0.0002 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				36	mg/kg	1.126	40.532	mg/kg	0.00405 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.57	mg/kg		0.57	mg/kg	0.000057 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				2.5	mg/kg		2.5	mg/kg	0.00025 %		
			205-912-4	206-44-0									
20		fluorene				0.16	mg/kg		0.16	mg/kg	0.000016 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	34	mg/kg		34	mg/kg	0.0034 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
27		phenanthrene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				2.1	mg/kg		2.1	mg/kg	0.00021 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				86	mg/kg	1.245	107.045	mg/kg	0.0107 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0295 %		

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: TP217B

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

Sample details

Sample name:
TP217B
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14 mg/kg	1.32	18.485 mg/kg	0.00185 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.75 mg/kg	2.775	2.082 mg/kg	0.000208 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.09 mg/kg		0.09 mg/kg	0.000009 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				19	mg/kg	1.126	21.392	mg/kg	0.00214 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	17	mg/kg		17	mg/kg	0.0017 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				24	mg/kg	1.579	37.908	mg/kg	0.00379 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.3	pH		8.3	pH	8.3 pH		
				PH									
27		phenanthrene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				73	mg/kg	1.245	90.864	mg/kg	0.00909 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0226 %		

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: BH304

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

Sample details

Sample name:
BH304
Sample Depth:
0.2 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.24 mg/kg		0.24 mg/kg	0.000024 %		
2	acenaphthylene		205-917-1	208-96-8		0.12 mg/kg		0.12 mg/kg	0.000012 %		
3	anthracene		204-371-1	120-12-7		0.35 mg/kg		0.35 mg/kg	0.000035 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		24 mg/kg	1.32	31.688 mg/kg	0.00317 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.2 mg/kg		2.2 mg/kg	0.00022 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2.4 mg/kg		2.4 mg/kg	0.00024 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		3.3 mg/kg		3.3 mg/kg	0.00033 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		1.5 mg/kg		1.5 mg/kg	0.00015 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.3 mg/kg		1.3 mg/kg	0.00013 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.91 mg/kg	2.775	2.526 mg/kg	0.000253 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	6.715 mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		37 mg/kg	1.462	54.078 mg/kg	0.00541 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		2.6 mg/kg		2.6 mg/kg	0.00026 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				61	mg/kg	1.126	68.679	mg/kg	0.00687 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.59	mg/kg		0.59	mg/kg	0.000059 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				4.1	mg/kg		4.1	mg/kg	0.00041 %		
			205-912-4	206-44-0									
20		fluorene				0.18	mg/kg		0.18	mg/kg	0.000018 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				1.4	mg/kg		1.4	mg/kg	0.00014 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	100	mg/kg		100	mg/kg	0.01 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.19	mg/kg		0.19	mg/kg	0.000019 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
27		phenanthrene				1.8	mg/kg		1.8	mg/kg	0.00018 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				3.5	mg/kg		3.5	mg/kg	0.00035 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				230	mg/kg	1.245	286.284	mg/kg	0.0286 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0619 %		

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: BH304[2]

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

Sample details

Sample name:
BH304[2]
Sample Depth:
0.6 m

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: 0% No 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				8.2 pH		8.2 pH	8.2 pH		
				PH							
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH304[3]

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

Sample details

Sample name:
BH304[3]
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.28	mg/kg		0.28	mg/kg	0.000028 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.28	mg/kg		0.28	mg/kg	0.000028 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.8	mg/kg	1.32	11.619	mg/kg	0.00116 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.8	mg/kg		1.8	mg/kg	0.00018 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		2	mg/kg		2	mg/kg	0.0002 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.8	mg/kg		2.8	mg/kg	0.00028 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		1.1	mg/kg		1.1	mg/kg	0.00011 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.1	mg/kg		1.1	mg/kg	0.00011 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.73	mg/kg	2.775	2.026	mg/kg	0.000203 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2	mg/kg	13.43	<2.686	mg/kg	<0.000269 %		<**LOD**
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16	mg/kg	1.462	23.385	mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		2.4	mg/kg		2.4	mg/kg	0.00024 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				2.4	mg/kg		2.4	mg/kg	0.00024 %		
			205-912-4	206-44-0									
20		fluorene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	12	mg/kg		12	mg/kg	0.0012 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				24	mg/kg	1.579	37.908	mg/kg	0.00379 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
27		phenanthrene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				1.9	mg/kg		1.9	mg/kg	0.00019 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				63	mg/kg	1.245	78.417	mg/kg	0.00784 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0211 %		

Key

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

Classification of sample: TP102

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

Sample details

Sample name:		LoW Code:	
TP102		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.5 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		15	mg/kg		15	mg/kg	0.0015 %		
2	acenaphthylene		205-917-1	208-96-8		0.87	mg/kg		0.87	mg/kg	0.000087 %		
3	anthracene		204-371-1	120-12-7		16	mg/kg		16	mg/kg	0.0016 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6	mg/kg	1.32	7.922	mg/kg	0.000792 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		93	mg/kg		93	mg/kg	0.0093 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		97	mg/kg		97	mg/kg	0.0097 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		130	mg/kg		130	mg/kg	0.013 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		37	mg/kg		37	mg/kg	0.0037 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		47	mg/kg		47	mg/kg	0.0047 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.49	mg/kg	2.775	1.36	mg/kg	0.000136 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.7	mg/kg	13.43	9.401	mg/kg	0.00094 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4	mg/kg	1.285	0.514	mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		**<LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		100	mg/kg		100	mg/kg	0.01 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8	mg/kg	1.126	9.007	mg/kg	0.000901 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				14	mg/kg		14	mg/kg	0.0014 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				120	mg/kg		120	mg/kg	0.012 %		
			205-912-4	206-44-0									
20		fluorene				11	mg/kg		11	mg/kg	0.0011 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				38	mg/kg		38	mg/kg	0.0038 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13	mg/kg		13	mg/kg	0.0013 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.66	mg/kg		0.66	mg/kg	0.000066 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				13	mg/kg	1.579	20.533	mg/kg	0.00205 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9	pH		9	pH	9pH		
				PH									
27		phenanthrene				54	mg/kg		54	mg/kg	0.0054 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				90	mg/kg		90	mg/kg	0.009 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				68	mg/kg	1.245	84.641	mg/kg	0.00846 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.104 %		

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: BH303B

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

Sample details

Sample name:	LoW Code:	
BH303B	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16 mg/kg	1.32	21.125 mg/kg	0.00211 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.77 mg/kg		0.77 mg/kg	0.000077 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.85 mg/kg		0.85 mg/kg	0.000085 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.6 mg/kg		1.6 mg/kg	0.00016 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.7 mg/kg		0.7 mg/kg	0.00007 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.41 mg/kg		0.41 mg/kg	0.000041 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.78 mg/kg	2.775	2.165 mg/kg	0.000216 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3 mg/kg	13.43	4.029 mg/kg	0.000403 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.1 mg/kg		1.1 mg/kg	0.00011 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				33	mg/kg	1.126	37.154	mg/kg	0.00372 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
			205-912-4	206-44-0									
20		fluorene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.69	mg/kg		0.69	mg/kg	0.000069 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	46	mg/kg		46	mg/kg	0.0046 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				19	mg/kg	1.579	30.01	mg/kg	0.003 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
27		phenanthrene				0.68	mg/kg		0.68	mg/kg	0.000068 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.89	mg/kg		0.89	mg/kg	0.000089 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				97	mg/kg	1.245	120.737	mg/kg	0.0121 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0301 %		

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: BH303B[2]

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:	
BH303B[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.6 m	Entry:	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 11.7 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		11.7 pH		11.7 pH	11.7 pH		
								Total:	0%		

Key

	User supplied data
	Hazardous result
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH303B[3]

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
BH303B[3]
Sample Depth:
1.1 m

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 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 12.3 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.35 mg/kg	2.775	0.971 mg/kg	0.0000971 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3 mg/kg	13.43	4.029 mg/kg	0.000403 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		

#		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									
14		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
15		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
16		copper { dicopper oxide; copper (I) oxide }				15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	28	mg/kg		28	mg/kg	0.0028 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				9.9	mg/kg	1.579	15.637	mg/kg	0.00156 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				12.3	pH		12.3	pH	12.3 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				74	mg/kg	1.245	92.109	mg/kg	0.00921 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0209 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated 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: TP206A

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

Sample details

Sample name:
TP206A
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45 mg/kg	2.775	1.249 mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	14	mg/kg		14	mg/kg	0.0014 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				15	mg/kg	1.579	23.692	mg/kg	0.00237 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				52	mg/kg	1.245	64.725	mg/kg	0.00647 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0165 %		

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: TP211

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

Sample details

Sample name:
TP211
Sample Depth:
1.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.48 mg/kg	2.775	1.332 mg/kg	0.000133 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	10	mg/kg		10	mg/kg	0.001 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				61	mg/kg	1.245	75.928	mg/kg	0.00759 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0187 %		

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: TP212

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

Sample details

Sample name:
TP212
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.54 mg/kg	2.775	1.499 mg/kg	0.00015 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	24.846 mg/kg	0.00248 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		16	mg/kg	0.0016 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				19	mg/kg	1.579	30.01	mg/kg	0.003 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8	pH		8	pH	8pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				65	mg/kg	1.245	80.906	mg/kg	0.00809 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0201 %		

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: TP212[2]

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

Sample details

Sample name:
TP212[2]
Sample Depth:
2 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.75 mg/kg	2.775	2.082 mg/kg	0.000208 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13	mg/kg		13	mg/kg	0.0013 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				30	mg/kg	1.579	47.385	mg/kg	0.00474 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8	pH		8	pH	8pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				67	mg/kg	1.245	83.396	mg/kg	0.00834 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.022 %		

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: TP214

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

Sample details

Sample name:
TP214
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.74 mg/kg	2.775	2.054 mg/kg	0.000205 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15	mg/kg	1.126	16.888	mg/kg	0.00169 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	15	mg/kg		15	mg/kg	0.0015 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		30	mg/kg	1.579	47.385	mg/kg	0.00474 %		
26		pH			PH		6.5	pH		6.5	pH	6.5 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		76	mg/kg	1.245	94.598	mg/kg	0.00946 %		
											Total:	0.0231 %		

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: TP214[2]

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

Sample details

Sample name:
TP214[2]
Sample Depth:
2.5 m

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: 0% No 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				7.1 pH		7.1 pH	7.1 pH		
				PH							
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH307[2]

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

Sample details

Sample name:		LoW Code:	
BH307[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.95 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		2.2 mg/kg	2.775	6.106 mg/kg	0.000611 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		23 mg/kg	1.462	33.616 mg/kg	0.00336 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				24	mg/kg	1.126	27.021	mg/kg	0.0027 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				39	mg/kg	1.579	61.6	mg/kg	0.00616 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				6.1	pH		6.1	pH	6.1 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				82	mg/kg	1.245	102.067	mg/kg	0.0102 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0278 %		

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: TP215

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

Sample details

Sample name:
TP215
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.17	mg/kg		0.17	mg/kg	0.000017 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17	mg/kg	1.32	22.446	mg/kg	0.00224 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.4	mg/kg		1.4	mg/kg	0.00014 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.5	mg/kg		1.5	mg/kg	0.00015 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		2.1	mg/kg		2.1	mg/kg	0.00021 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.95	mg/kg		0.95	mg/kg	0.000095 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.92	mg/kg		0.92	mg/kg	0.000092 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45	mg/kg	2.775	1.249	mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2	mg/kg	13.43	<2.686	mg/kg	<0.000269 %		<**LOD**
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14	mg/kg	1.462	20.462	mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.8	mg/kg		1.8	mg/kg	0.00018 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	15.762	mg/kg	0.00158 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.31	mg/kg		0.31	mg/kg	0.000031 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				1.9	mg/kg		1.9	mg/kg	0.00019 %		
			205-912-4	206-44-0									
20		fluorene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.91	mg/kg		0.91	mg/kg	0.000091 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	22	mg/kg		22	mg/kg	0.0022 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8	pH		8	pH	8pH		
				PH									
27		phenanthrene				0.89	mg/kg		0.89	mg/kg	0.000089 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				1.4	mg/kg		1.4	mg/kg	0.00014 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				47	mg/kg	1.245	58.502	mg/kg	0.00585 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0184 %		

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: TP101

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

Sample details

Sample name:		LoW Code:	
TP101		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.5 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		1.3	mg/kg		1.3	mg/kg	0.00013 %		
2	acenaphthylene		205-917-1	208-96-8		0.12	mg/kg		0.12	mg/kg	0.000012 %		
3	anthracene		204-371-1	120-12-7		1.4	mg/kg		1.4	mg/kg	0.00014 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8	mg/kg	1.32	10.563	mg/kg	0.00106 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		6	mg/kg		6	mg/kg	0.0006 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		8.3	mg/kg		8.3	mg/kg	0.00083 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		11	mg/kg		11	mg/kg	0.0011 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		6.1	mg/kg		6.1	mg/kg	0.00061 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		4.1	mg/kg		4.1	mg/kg	0.00041 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.56	mg/kg	2.775	1.554	mg/kg	0.000155 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6	mg/kg	13.43	8.058	mg/kg	0.000806 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5	mg/kg	1.285	0.643	mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		**<LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		6.8	mg/kg		6.8	mg/kg	0.00068 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8.5	mg/kg	1.126	9.57	mg/kg	0.000957 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				11	mg/kg		11	mg/kg	0.0011 %		
			205-912-4	206-44-0									
20		fluorene				0.93	mg/kg		0.93	mg/kg	0.000093 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				5.2	mg/kg		5.2	mg/kg	0.00052 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	19	mg/kg		19	mg/kg	0.0019 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				7.1	mg/kg	1.579	11.214	mg/kg	0.00112 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.2	pH		9.2	pH	9.2 pH		
				PH									
27		phenanthrene				5.6	mg/kg		5.6	mg/kg	0.00056 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				9	mg/kg		9	mg/kg	0.0009 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				39	mg/kg	1.245	48.544	mg/kg	0.00485 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.022 %		

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

pH (CAS Number: PH)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

beryllium {beryllium oxide}

Worst case species based on hazard statements

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

Worst case species based on hazard statements

cadmium {cadmium sulfide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

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

Worst case species

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

Worst case species based on hazard statements

mercury {mercury dichloride}

Worst case species based on hazard statements

nickel {nickel dihydroxide}

Worst case species based on hazard statements

zinc {zinc oxide}

Worst case species based on hazard statements

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2024.158.6092.11254 (06 Jun 2024)
HazWasteOnline Database: 2024.158.6092.11254 (06 Jun 2024)

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

Appendix G Preliminary geotechnical risk register

Geotechnical Hazard Identification – Following Ground Investigation

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

Table G.1: Qualitative assessment of hazards and risks

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

Table G.2: Hazard identification

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Uncontrolled Made Ground (variable strength and compressibility).	There is Made Ground due to historical construction activity at the site.	Residential Dwellings.	Bearing capacity failure, settlement (total and differential).	3	4	12	Design foundations to found below Made Ground or on Made Ground which has been improved.
			Floor slab failure.	3	4	12	Design floor slabs as suspended.
		Roads and Pavements.	Settlement (total and differential) of roads and pavements.	2	2	4	Design roads and pavements using suitable geotechnical parameters.
		Services.	Settlement (differential), causing damage to services.	1	2	2	Anticipated settlements are unlikely to be significant with regard to services. There is a requirement to improve the Made Ground prior to installation of services.
		Gardens.	Settlement (differential), in gardens.	1	2	2	It is unlikely that settlements will be significant with regard to gardens.
		Constructio n staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavation and replacement with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Variable lateral and vertical changes in	The Made Ground soils vary laterally and vertically, both	Residential Dwellings.	Foundation bearing capacity failure, settlement (total and differential).	2	4	8	Design foundations to found below Made Ground or on Made Ground which has been improved.

ground conditions.	in composition and strength.		Floor slab failure.	2	4	8	Design floor slab as suspended.
		Roads and Pavements.	Settlement (total and differential), of roads and pavements.	2	3	6	Design roads and pavements using suitable geotechnical parameters and increase the sub-base and use geo-grids as appropriate. If anticipated settlements are significant, and cannot be mitigated by design, over-excavate and replace unsuitable soils.
		Services.	Settlement (differential), causing damage to services.	1	3	3	Settlements are not anticipated to be significant with regard to services. No additional design requirements envisaged.
		Gardens.	Settlement (differential), in gardens.	1	3	3	It is unlikely that settlements will be significant with respect to gardens.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavate and replace with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Sulfates present in the soils.	The ground investigation has proven that there is the potential for sulfate bearing soils to be present.	Attack of buried concrete.	Damage to concrete and reduction in strength.	3	4	12	Design concrete according to BRE sulfate classification of Made Ground.
Obstructions.	Obstructions have been proven by the investigation and there is a potential for additional	Construction staff, vehicles and plant operators.	Risk of collapse of excavation as obstructions are pulled out.	3	3	9	Allow for a breaker to be present during construction and remove obstructions where encountered during construction.

	obstructions to be present due to historical construction activity, or unknown fill in Made Ground.	Roads and Pavements.	Hard spots in externals and roads / pavements.	3	2	6	
Slope stability issues – General Slopes.	The site is on sloping ground and the proposed development requires slopes to be formed as part of the cut to fill.	Residential Dwellings.	Serviceability issues.	2	4	8	Safe slope angles to be assessed during design. Engineered fill requirements to be defined at outline design stage. Drainage requirements to be assessed during design. Slopes to be constructed at a safe angle.
		Roads and Pavements.	Serviceability issues.	2	3	6	
		Gardens.	Serviceability issues.	1	2	2	
Slope stability issues – retaining walls.	The site is on sloping ground and the proposed development requires removal and replacement of existing retaining walls	Residential Dwellings.	Serviceability issues.	2	4	8	Design of the retaining to be undertaken in accordance with EC7. Adequate drainage to be designed behind the structure, or for water seepage through the face of the wall. Lateral earth pressure parameters to be characterised during investigation and design.
		Pavement construction and long-term durability highways and external areas.	Serviceability issues.	2	3	6	
		Gardens.	Serviceability issues.	1	2	2	
Unforeseen ground conditions - risk associated with limited data.	Ground investigation has been undertaken. However, additional information will be obtained during	All aspects of the development.		3	4	12	Designers to be contacted if conditions encountered are different to those identified during investigation. Regular inspections of excavations and earthworks for evidence of stability.

	construction. Ground conditions are only defined at exploratory hole locations.				Adequate investigation required to characterise the site and understand the potential risks.

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

Impacts of the design with regard to health and Safety considerations will need to be included by the designer at design stage.

Appendix H Plausible source-pathway-receptor contaminant linkages

Summary of potential contaminant linkages

Table H.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2019) and additional risk assessment is required.

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

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

Table H.1: Consequence versus probability assessment.

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

Table H.2: Consequence versus probability assessment.

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Made Ground, associated with historical construction activities, possibly including PAH (S01).	Ingestion, skin contact, inhalation by people (P01).	Site end users (R01).	Likely.	Medium.	Moderate.	PAH has been identified in Made Ground in the northern residential area of the site.
	Surface water via overland flow (P03).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Low likelihood.	Medium.	Low.	Elevated concentrations of PAH have been recorded in Made Ground in the roadways around the site. Mobilisation of contaminants is expected to be limited due to surface hard standing inhibiting interaction between surface water and PAH below the surface.
	Surface water, via drainage discharge (P04).		Low likelihood.	Medium.	Low.	
	Downward leachate migration (P06).		Low likelihood.	Medium	Low.	Groundwater was only encountered in borehole BH307 after the investigation in the range of 2.5 – 6.99m bgl. Therefore, the likelihood of PAH infiltrating to groundwater at depth is low.
	Surface water via base flow from groundwater (P05).		Low likelihood.	Medium	Low	
~~PCBs and oils from transformers in the electricity sub-stations on site (S02).~~	Source not encountered.					
~~Ground gases (carbon dioxide and methane) from organic materials in the Made Ground (S03).~~	Ground gas at the site has been categorised as CS1, and therefore this is not deemed a source of contaminant.					

Asbestos within existing buildings / structures (S04).	Inhalation (P01).	Site end users (R01).	Likely.	Severe.	High.	The properties on the Penrhys estate were constructed prior to 2000 and are likely to contain asbestos. Building interiors were not within the scope of the Ground Investigation works, and thus this remains a risk to development.
Asbestos associated with the boiler house in the north of the site (S05).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Severe.	High.	The boiler house was not accessible at the time of the ground investigation for assessment; however it has been assumed to contain asbestos due to the age of the construction.
Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials (S06).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Likely.	Severe.	High.	Fly tipped waste was identified on site during the initial walkover and Ground Investigation works. These areas of fly-tipped waste have not been screened for contaminants during the investigation, and thus cannot be discounted as a risk to the end user.
Asbestos Containing Materials associated with gaskets on the former pipe work of the district heat network (S07).	Ingestion, skin contact, inhalation of dust and outdoor air by people (P01).	Site end users (R01).	Low likelihood.	Severe.	Moderate.	Lagging and gaskets were sampled below manhole covers that were lifted during the Ground Investigation. Of the 20 samples screened for asbestos, only one sample returned a positive ID for chrysotile in a piece of loose gasket.
Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons (S08).	Ingestion, skin contact (P01).	Site end users (R01).	Likely.	Medium,	Moderate.	Waste fires have been identified the residential zone of the site, and burnt rubble which may feature from the fires remains in situ, Fires have not been investigated in the package of works due to safety constraints.
	Downward leachate migration (P06).	Groundwater: Secondary A aquifer status of the Rhondda Member (R03).	Low likelihood	Medium	Low.	Groundwater was only encountered in borehole BH307 between 2.5m and 6.99m bgl. Therefore it is likely that most of the potential contaminants will naturally attenuate before reaching the groundwater.

Petroleum hydrocarbons and VOC/SVOC in groundwater below the site (S09).	Inhalation (P01) / VOC/SVOC release to outdoor air (P07).	Site end users (R01).	Likely.	Severe.	Moderate.	Elevated VOC concentrations circa 100ppm were detected in gas monitoring cycles at borehole BH307.

Hydrock Consultants Ltd., November 2024. 'Penrhys – Materials Management Overview'. Ref: 30603-HYD-XX-XX-RP-GE-1005, for Trivallis;

Project name	Penrhys Village			
Technical note title	Additional Groundwater Monitoring Note			
Document reference	30603-HYD-XX-XX-RP-GE-1004			
Author	Emily Frankish BSc (Hons) MSc FGS			
Revision	First Issue			
Date	30 September 2024	Approved by	Alexandra Edwards	✓

1. Introduction

In July 2024, during the ground gas and groundwater level monitoring at the site, it was noted that BH307 was exhibiting differing gas concentrations and groundwater levels from the rest of the site, Hydrock Consultants Limited (Hydrock) was commissioned by Trivallis (the Client) to undertake additional groundwater monitoring and sampling at BH307 to further assess / understand the differences seen in this location at Penrhys Village, Penrhys Road, Penrhys, Ferndale, CF43 3RN.

Current proposals for the wider site include the development of circa 900 residential dwellings, associated sports facilities, recreational areas and a new primary school, the general outline of this is shown on the Urbanists Framework Masterplan (2238-URB-XX-XX-DR-UD-XX-001) in Appendix A.

1.1 Previous Investigation Reports

Hydrock have previously completed a number of reports relating to the site:

- Due Diligence Report dated 31 July 2023. Ref: 30603-HYD-XX-XX-RP-GE-1000-S2-P1;
- Phase 1 Ground Conditions Desk Study dated 9 November 2023. Ref: 30603-HYD-XX-XX-RP-GE-1001-S2-P2;
- Abnormal Costs Review dated March 2024. Ref: 30603-HYD-XX-XX-RP-GE-1002-S2-P1; and,
- Phase 2 Ground Investigation report (GIR) dated 22 August 2024. Ref; 30603-HYD-XX-XX-RP-GE-1003-S2-P1.

It is recommended that the above reports are read in conjunction with this technical note, however pertinent information from the previous reports is included below for ease of reference.

2. Project Background

2.1 Site Setting

The below table is a summary of the environmental setting for the site,

Table 2.1: Environmental Site Setting

Item	Context
Site Description and Boundaries	The c. 29.86 Ha site is irregular in shape and situated on the hillside between Pontygwaith and Ystrad in Rhondda Cynon Taf. The site development area is generally split into a northern and southern area. The larger northern area currently comprises c. 268 homes, a primary school, two play areas, a convenience store and fast-food takeaway. The eastern part of the northern area comprises largely hardstanding areas remaining from the demolition of houses in the 2000s. The southern section of the site comprises open green space that features the statue of Our Lady of Penrhys and an open-air amphitheatre.

Item	Context
	A large boiler house (that previously provided district heating to the village) is located on the northern site boundary. The site is bound by open land to the west and east which slope steeply to the Rhondda Fawr valley in the west and the Rhondda Fach valley in the east. To the north of the site is an area of coniferous forest.
Topography and elevation	The site is situated at c. 310 m Above Ordnance Datum (mAOD). The site slopes to the south, from an elevation of c. 350mAOD in the north to 270mAOD in the south. with a number of terraces formed on the hillslope to provide development platforms for the houses currently present in the northern part of the site.
Geology and Hydrogeology	The site is underlain by the Rhondda Member sandstones with thin mudstone/siltstone interbeds and coal. The Rhondda Member is classified as a Secondary A Aquifer. Shallow perched groundwater is anticipated within any Made Ground (associated with the construction of housing). A deeper groundwater body is also anticipated within the Rhondda Member Sandstones. It is anticipated that groundwater flows to the south/south-west, towards the Rhondda River.
Hydrology	A number of unnamed inland streams are located within the vicinity of the site, one along the northern site boundary (that crosses onto site), one c. 10m west of the site, a stream network connecting to the Rhondda River c. 60m to the south-west of the site, and one c. 160m north-east of the site,
Site History	The site was previously open land until the social housing estate was constructed in the north during the late 1960s. The surrounding area is noted to have been historically mined for coal.
Anthropomorphic Geotechnical Hazards	The site lies within the South Wales Coalfield and historically has been mined to over 180m below ground level The area is prone to landslides and some historic landslips are mapped on the slopes mainly to the east of the site.

2.2 Phase 2 Ground Investigation Findings

The Phase 2 Ground Investigation was designed by Hydrock and completed by Geotechnical Engineering Ltd. (GEL) and comprised the following intrusive methods:

- 7 No. rotary cored boreholes;
- 23 No. machine excavated trial pits;
- 1 No. hand excavated trial pits; and,
- 17 No. TRL dynamic cone penetrometers.

All 7 boreholes were installed as per the table below, to provide monitoring wells for return ground gas and groundwater level monitoring visits.

Table 2.2: Standpipe installation details

Location	Ground Level (mAOD)	Standpipe diameter (mm)	Response zone (mbgl)	Strata Targeted
BH301	335.60	50	1.00 to 2.50	Made Ground
BH302B	345.35	50	2.80 to 9.30	Rhondda Member
BH303B	341.05	50	1.00 to 2.40	Made Ground
BH304	310.00	50	1.00 to 3.60	Made Ground
BH305	320.75	50	1.00 to 3.20	Made Ground
BH306	311.10	50	3.00 to 8.20	Rhondda Member
BH307	285.10	50	1.40 to 9.50	Rhondda Member

2.2.1 Ground Conditions

Ground conditions were found to broadly be the same across the site with the Rhondda Member encountered below Made Ground/Topsoil between 0.6m to 4.40m depth and comprised moderately weak to medium strong sandstone with occasional subordinate weak mudstone interbeds and with occasional laminae of coal.

Surface soils in the northern part of the site comprised either hardstanding (tarmac or concrete) over Made Ground or grass over Made Ground to between 0.3m and 4.40m depth. The Made Ground generally comprised variable quantities of silt, gravel, sand and clay with inclusions of concrete, polystyrene, plastic, rebar.

The shallow ground conditions in the southern part of the site comprised grass over topsoil comprising soft brown slightly sandy slightly gravelly silty clay/clayey silt with frequent rootlets to between 0.2m and 0.6m depth over Rhondda Member as described above. BH307 also encountered a sandstone gravel horizon between 0.06m and 1.40m depth, tentatively identified as weathered Rhondda Member.

2.2.2 Ground Gas and Groundwater

During the intrusive investigation, groundwater was encountered within TP214 only at 2.5mbgl. As no other location recorded groundwater ingress, this was concluded to represent perched water contained within the Made Ground soils.

During the six subsequent return ground gas and groundwater level monitoring visits, groundwater was encountered within BH307 only, at depths of between 2.50 and 7.00m bgl.

Flow rates for the Rhondda Member were not recorded above 0.1 l/hr. A maximum flow of 0.3 l/hr was recorded for the Made Ground.

No methane was recorded on any occasion within the Made Ground or Rhondda Member.

Low levels of carbon dioxide were recorded within the Rhondda Member (maximum of 2.4%), the Made Ground returned maximum carbon dioxide readings of 7.4 %.

Oxygen concentrations were generally fairly stable, and similar to atmospheric conditions. However, depleted Oxygen was noted within BH304 where Carbon Dioxide concentrations were elevated (6-7%) and for BH307, where Carbon Dioxide levels were not elevated but oxygen was at 0.6-1.5%.

It should be noted that the final 3 monitoring visits were completed with additional equipment for the monitoring of volatile organic compounds (VOC) using a handheld Photo-Ionisation Detector (PID). This monitoring of VOC was beyond the original agreed scope; however, it highlighted significant quantities of vapours in borehole BH307 (circa 100ppm on all three visits) in comparison to the other monitoring locations which did not record VOC levels above 10ppm.

Given the unexpected presence of high levels of VOC recorded in BH307, further discussion with GEL to determine the cause of this was undertaken, particularly to identify whether any evidence of contamination was noted at this location during the drilling of the borehole and earlier monitoring. The GEL site engineer confirmed the following:

- Borehole BH307 was pumped clean of water with the rig prior to installation;
- No obvious visual or olfactory evidence of contamination within the recovered soils was noted; and,
- No contamination of groundwater was observed.

2.2.3 Contamination Risk Assessment

Contamination testing of the soils across site confirmed that general Made Ground soils across the majority of the site did not require specific remediation. Made Ground encountered beneath the roadways were found to contain elevated concentrations of PAHs.

Soil leachate data indicated that leaching of contamination within the Made Ground soils may occur, but this was concluded to be of low risk for the majority of the site, and particularly in the southern part of the site (in the vicinity of BH307) where limited Made Ground deposits were encountered.

2.2.4 Ground Gas Risk Assessment

The ground gas risk assessment concluded a preliminary Characteristic Situation 1 for the site based on the available site data with recommendations for additional monitoring to further understand the nature of elevated Carbon Monoxide and VOC in BH307.

3. Rationale for additional monitoring

Given that no evidence of contamination was noted during the excavation of the BH307, nor during the subsequent monitoring or chemical testing of the soil samples, it was concluded that additional groundwater sampling and monitoring should be undertaken to investigate the presence of the elevated VOC.

3.1 Conceptual Site Model

The final conceptual site model (CSM) for the site is presented in Appendix A (30603-HYD-XX-XX-DR-GE-1016). A number of plausible pollutant linkages have been concluded for the site and are generally associated with the Made Ground in the northern part of the site.

This technical note relates to the recorded elevated VOC within BH307 with the following associated pollutant linkage:

- Source: Petroleum hydrocarbons and VOC/SVOC in groundwater below the site
- Pathway: Inhalation of VOC/SVOC and petroleum hydrocarbon vapours outdoors & indoors
- Receptor: People (neighbours, site end users)

Prior to any additional investigation, consideration of potential sources of petroleum hydrocarbons and VOC/SVOC was made. The following potential sources were concluded based on the known site history:

- Contamination from the grave yard directly to the northeast of this area of the site;
- Localised spill of diesel or hydraulic fluid from the drill rig during borehole progression and installation; and,
- Spillage of solvent/petroleum hydrocarbons during fly-tipping activities.

3.2 Proposed Investigation Methodology

Groundwater sampling from BH307 to determine whether a source of VOC was present within the groundwater.

Ground gas monitoring of BH307 to assess whether elevated VOC levels and depleted Oxygen levels were related to any identified contamination within the groundwater, or whether an instrument error was in part responsible.

4. Additional Monitoring Works

The additional phase of ground gas and groundwater monitoring with low flow groundwater sampling of BH307 only was completed between 24 July 2024 and 02 September 2024.

An initial visit to sample the groundwater was completed by Hydrock on 24 July 2024 with testing indicating the presence of petroleum hydrocarbon contamination (discussed in detail within Section 0 below).

Following this initial visit by Hydrock, a further two ground gas monitoring and groundwater sampling visits were instructed by the Client and completed by Enitial using low-flow techniques (09 August and 02 September 2024).

The following sections present all previous data from the GIR alongside the additional data collected within the additional monitoring and sampling works.

4.1 Groundwater Level Monitoring

The depth to groundwater below ground level was recorded on each return visit. Results are presented below.

Table 4.1: BH307 Groundwater Level Monitoring Summary

Date monitored	Monitored by	Depth to groundwater (m bgl)	Groundwater Level (mAOD)	Response Zone Flooded?
17/05/24	GEL	2.50	282.60	No
23/05/24	GEL	2.58	282.52	No
31/05/24	GEL	2.50	282.60	No
14/06/24	GEL	4.31	280.79	No
21/06/24	GEL	4.60	280.50	No
28/06/24	GEL	6.99	278.11	No
24/07/24	Hydrock	7.77	277.33	No
09/08/24	Enitial	8.59	276.51	No
02/09/24	Enitial	7.60	277.50	No

Hydrock used an interface meter, and confirmed no free phase hydrocarbons were present on the surface of the groundwater.

The data shows that over the drier summer months, groundwater level decreased by c. 6m. It is anticipated that during dry periods, as there is less recharge, groundwater levels will decrease, however in this case the change in levels is particularly extreme.

4.2 Ground Gas Monitoring Data

6 rounds of ground gas monitoring have been completed by GEL, one round completed by Hydrock and two rounds completed by Enitial. The results of all monitoring visits are presented in Table 4.2.

Table 4.2: BH307 Ground Gas Result Summary

Date monitored	Monitored by	Atmospheric Pressure (kPa)	Flow rate (l/hr)	Carbon dioxide (%)	Methane (%)	Oxygen (%)	Carbon monoxide (ppm)	VOC (ppm)
17/05/24	GEL		No gas monitoring undertaken - headworks damaged.					
23/05/24	GEL	982 (R)	0.0	1.2	0.0	3.9	0.0	-
31/05/24	GEL	989 (R)	0.0	1.4	0.0	0.9	0.0	-
14/06/24	GEL	966 (F)	0.0	1.2	0.0	0.0	0.0	99.2
21/06/24	GEL	981 (F)	0.0	1.1	0.0	0.1	0.0	103.0
28/06/24	GEL	983 (R)	0.0	1.2	0.0	0.2	25.0	108.6
24/07/24	Hydrock	986 (R)	0.0	1.5	0.2	0.3	9.0	33.2
09/08/24	Enitial	1015 (S)	0.0	2.1	0.0	0.2	2.0	7.2
02/09/24	Enitial	1010 (S)	0.0	2.3	0.0	2.3	1.0	0.7
Worst case scenario			0.0	**2.3**	**0.2**	**0.0**	**25.0**	**108.6**

Over the nine ground gas monitoring visits, a range of atmospheric pressure trends were encountered, with low and falling pressure during the visit on 14 and 21 June 2024.

Carbon dioxide levels were fairly consistent for certain pressure ranges, e.g. at lower pressure (966 to 986 kPa), low Carbon Dioxide values were recorded (1.1 – 1.5%) and vice versa for the maximum atmospheric pressure (1010 - 1015 kPa with a range of 2.1 – 2.3% Carbon Dioxide).

Depleted Oxygen levels were recorded for the same visit as the minimum recorded atmospheric pressure (also during falling pressure trends) on 14 June. This was also on a visit where groundwater had dropped from 2.5m bgl to 4.3m bgl.

Methane was recorded on one occasion with a maximum concentration of 0.2%. No flow was recorded on any occasion.

Generally recorded VOC levels within BH307 decreased across the 9 monitoring visits, initially recorded at 99.2 ppm on 14 June and finally at 0.7 ppm on 02 September.

It should be noted that on no occasion was the response zone flooded within BH307.

4.3 Groundwater Sampling

A groundwater sample was collected on each of the three additional return monitoring visits.

On 24 July, Hydrock purged the well prior to collecting a grab sample using a bailer, The water was visually greyish black in colour, and had a slight hydrocarbon odour.

The return Enitial groundwater sampling was completed using a peristaltic pump in order to satisfy low-flow conditions. The sample collected on 09 August was described deep grey with a slight sheen and with high turbidity and sediment load. The groundwater sample collected on 02 September was described as light brown with slight sheen and high turbidity.

4.3.1 *Chemical Testing*

All groundwater samples were sent to i2 Analytical for chemical testing as follows:

- Metals and metalloids;
- Polycyclic Aromatic Hydrocarbons (PAH)
- Total Petroleum Hydrocarbons (TPH),
- Volatile Organic Compounds (VOC), and,
- Semi-Organic Volatile Compounds (SVOC)

In addition to the above, the grab sample collected by Hydrock on 24 July 2024 was also tested for Formaldehyde to assess whether there was an influence from the graveyard.

The completed suites of testing where selected to aid in the identification of the potential source of VOC as discussed in Section 3.1.

The results of the chemical analysis are presented in Appendix C.

5. Ground Gas Risk Assessment

The additional ground gas monitoring data for BH307 has been added to the data collected from the Phase 2 GIR and is presented in Appendix B.

The monitoring data from this phase of additional works is consistent with the previous Phase 2 data with no recorded concentrations of methane or carbon dioxide exceeding the maximum previously recorded. The conclusion of Characteristic Situation 1 for the ground gas regime in the vicinity of BH307 is therefore confirmed.

Given the reduction of the recorded concentration of VOC over the monitoring programme (reducing by an order of 100), it is considered that no significant source of VOC generation is present in the vicinity of BH307 and therefore is likely to be of low risk to the identified receptor (human health).

6. Groundwater Risk assessment

6.1 Risk assessment approach

Using the CSM, a Stage 1 Tier 2 generic quantitative risk assessment (GQRA) for identified receptors based on the groundwater samples has been undertaken in accordance with the principles of LCRM (GQRA for other media are presented within the GIR).

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

In cases where potentially unacceptable risks are indicated and/or the land is potentially unsuitable for its intended use, actions such as more advanced stages of risk assessment (Tier 3, detailed quantitative risk assessment (DQRA)) or remediation are proposed (see Section 7).

6.2 Controlled Waters Risk Assessment

6.2.1 *Generic Assessment Criteria*

The risks to groundwater and surface water from contaminants on site have been assessed in accordance with the Environment Agency (2006) Remedial Targets Methodology (RTM) Levels 1-2. In doing so the compliance point for the assessment is set as the groundwater directly beneath the site on a precautionary basis.

Site contaminant concentrations are compared with relevant screening values (Water Quality Targets (WQTs), which are linked to the CSM.

Acceptable WQT are defined for protection of human health (based on Drinking Water Standards (DWS)) and for protection of aquatic ecosystems (Environmental Quality Standards (EQS)). In this instance, site concentrations have been compared against EQS on the basis that:

- The site is underlain by the Rhondda Member which is classified as a Secondary A Aquifer;
- The site is not located within a source protection zone;
- There are no active abstractions within 1km of the site boundary; and,
- The nearest downgradient surface water feature is c. 60m south of the site.

The values adopted are detailed in Appendix E and the use of these values in this assessment is considered as a first screening for potential risks of pollution of Controlled Waters. More detailed assessment may be required, with this identified in Section 7.

There are no UK EQS WQT for petroleum hydrocarbon fractions in water. Provisional predicted no-effect concentrations (PNEC) protective of aquatic toxicity can be calculated using the European Chemicals Agency's (ECHA) methodology and Concawe's report on the environmental classification of petroleum substances. Such assessment suggests that 10µg/l is a reasonable ecological-based WTV. UK EQS for TPH indicator compounds for benzene, toluene, xylenes and naphthalene take precedence in any assessment.

In some instances, the reporting limit (or detection limit) quoted by the laboratory may be greater than the WQT that it is being assessed against. As the current exercise is an initial screening assessment, further assessment of these elements has not been undertaken if all concentrations are reported to be below that limit.

6.2.2 *Assessment results*

Groundwater data assessment sheets are presented in Appendix E. Based on the data comparison against the WTV the results indicate that the chemicals of potential concern (CoPC) require further assessment are Cobalt, Iron, Manganese, Mercury, Nickel, Silver Fluoranthene, Aromatic Petroleum Hydrocarbon fractions >EC10-12, >EC12-16, >EC16-21 and >EC21-EC35 and Aliphatic Petroleum hydrocarbon fraction >EC21-EC35. No BTEX were recorded above the limit of detection.

The recorded exceedances are summarised in the below table.

Table 6.1: Groundwater risk assessment EQS exceedances

CoPC	Screening Value	No. Samples	No. Samples above Limit of Detection (LoD)	Min. (µg/l)	Max. (µg/l)	No. Samples Exceeding GAC and above LoD
Heavy Metals						
Cobalt	3.0	3	3	2.3	5.6	1
Iron	1.0	3	2	0.056	2.7	1
Manganese	123	3	3	1400	4400	3
Mercury	0.07	3	1	<0.05	0.08	1
Nickel	4	3	3	7.60	10.0	3
Silver	0.05	3	1	<0.05	0.82	1
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.0063	3	2	<0.01	0.16	1

CoPC	Screening Value	No. Samples	No. Samples above Limit of Detection (LoD)	Min. (µg/l)	Max. (µg/l)	No. Samples Exceeding GAC and above LoD
Petroleum Hydrocarbons						
Aromatic >EC10-EC12	10	3	1	<10	16	1
Aromatic >EC12-EC16	10	3	2	<10	40	2
Aromatic >EC16-EC21	10	3	2	<10	50	2
Aromatic >EC21-EC35	10	3	1	<10	20	1
Aliphatic >EC21-EC35	10	3	1	<10	190	1

A number of other VOC and SVOC were also detected in the groundwater. However, there are no water quality targets available for these (see Table 6.2:).

Table 6.2: Additional substances recorded in groundwater

Chemical	Max. Conc. (µg/l)
Fluorene	0.23
Phenanthrene	0.68
Pyrene	0.09
2-Methylnaphthalene	0.87
3&4-Methylnaphthalene	7.50
4-Methylphenol	7.46

The above VOC and SVOC concentrations were all recorded in either the first or second of the three samples collected from BH307. No concentration above the limit of detection was recorded in the final sample.

Methylnaphthalene is considered to be an indicator compound for a source comprising diesel fuel or kerosene.

6.2.3 *Risk evaluation*

A graph showing concentrations for detected petroleum hydrocarbons fractions over time is presented within Appendix C.

This shows that generally the concentrations of petroleum hydrocarbons peaked during the second sampling visit and dropped during the third sampling visit. This occurred at the same time that groundwater levels dropped from 7.77m to 8.6 mbgl (between the first sampling visit to the second) and when groundwater levels increased from 8.60 to 7.60m (second sampling visit to the third).

The above suggests that dilution may be a factor in relation to the concentrations of identified CoPC in the groundwater at this location. This also indicates that:

- A source of heavy metals may be present up-gradient of BH307 that hasn't been identified;
- A minor point source of petroleum hydrocarbons has been depleted by the groundwater sampling.

It is considered that the PAH and petroleum hydrocarbon contamination identified is not a risk to controlled waters as concentrations have been reducing over time to below the limit of detection It is therefore concluded that the source is likely to be residual contamination from a small point source, for example a small spillage of fuel.

Given that no benzene, toluene, ethylbenzene or xylenes have been detected, it is considered that the source of petroleum hydrocarbons is unlikely to be petrol. It is considered, that given the presence of methylnaphthalene and the detection of heavy end petroleum hydrocarbon fractions, that the source of the recorded PAH and petroleum hydrocarbons is diesel fuel or kerosene.

In regards to the heavy metals contamination, it is noted that groundwater data[1] for the South-East Valleys Carboniferous Coal Measures (including the Rhondda Member) has a poor overall rating, driven by the chemical quality of the groundwater.

Soil leachate data (discussed fully in the Hydrock GIR) indicates that the only risk from leachate of soils in BH307 (and the rest of the site) is related to Copper concentrations. It is therefore concluded that the heavy metal contamination in the groundwater is not attributable to the identified Made Ground soils on site given the wide range and high concentrations of Manganese and Nickel.

In further support of this, the site is located within the South Wales Coal Measures and is situated in an area of intense mining as indicated in drawing 30603-HYD-XX-XX-DR-GE-1001 (Appendix A). Additionally, in 2024, Natural Resources Wales stated[2] the following:

'*metals – including manganese, iron….and nickel…. are naturally occurring but can also be because of contamination. Our long history of metal and coal mine extractions means metal rich groundwater from over 1300 abandoned mines causes pollution in many rivers*'

'sodium - …is a naturally occurring element……exceeds the drinking water standard in 2% of groundwater samples….exceedances….relate to seawater intrusion, mine discharge and possibly food and industrial processing.'

Furthermore, the only heavy metals to be detected within the groundwater and also exceed the relevant WQT were Nickel and Manganese.

We therefore consider that the heavy metals concentrations within the groundwater is a product of the mining legacy in Wales rather than due to a site-specific source.

Whilst there are concentrations of Chemicals of Potential Concern elevated above the water quality criteria, based on the investigation works undertaken to date and subject to agreement with Natural Resources Wales, it is not considered that the site poses a significant risk to Controlled Water.

6.3 Groundwater (dissolved phase) assessment

The risks to human health arising from vapours in dissolved phase groundwater have been assessed in accordance with the SoBRA GW GAC guidance (2017). This is a preliminary approach whereby GAC have been developed using the CLEA v1.071 model for indoor air and outdoor inhalation pathways only, assuming a residential or commercial end-use.

No exceedances of the SoBRA GW vapour GAC for residential end use were recorded. This indicates a low risk with regard to dissolved phase VOC in groundwater. As such, dissolved phase VOC in groundwater does not require further consideration.

[1] https://waterwatchwales.naturalresourceswales.gov.uk/en/

[2] https://naturalresourceswales.gov.uk/about-us/news-and-blogs/blogs/the-state-of-our-groundwater-in-wales-an-assessment-of-groundwater-quality/?lang=en

7. Conclusions and Recommendations

7.1 Conclusions

The gas regime in the vicinity of BH307 is consistent with previous conclusion of CS1 for the wider site. It is not considered that a vapour source is present on site following the recorded depletion of VOC.

It is concluded that the groundwater at BH307 is impacted with heavy metals, with exceedances of Manganese and Nickel recorded across the three groundwater samples. Following a review of the available soil and leachate data, it is likely that the heavy metals contamination can be attributed to the mining history and contamination of the surrounding area, rather than a source present on site.

It is considered that any potential source of petroleum hydrocarbons or PAH is of low risk to controlled waters, with concentrations found to reduce following two sampling rounds with associated borehole purging, with results in the final sample all recorded below the laboratory limit of detection.

The possible source of the grave yard has been discounted as chemical testing for formaldehyde returned concentrations below the limit of detection.

An assessment of potential vapour risk from volatile compounds within the groundwater indicates no risk to human health.

7.2 Recommendations for further work

It is understood that further investigation is required on site as part of the detailed design stage and therefore it is recommended that additional boreholes are drilled in this area of the site so that there are multiple sample points to establish if this is a wider issue or just a localised area of mild contamination.

Given the limited data available, both spatially and across a longer time period, it is recommended that additional sampling positions and groundwater level monitoring visits are completed during winter months when groundwater is likely to be higher. It is also recommended that additional groundwater sampling be completed to provide further evidence for our conclusions, which at this stage are preliminary.

.

Appendix A - Drawings

the urbanists
planning & design

Client	Trivallis
Project	Penrhys
Title	Framework Masterplan

Project ID	Organiser	Role	Block	Level	Type	Series	Dwg	Rev.	Status
2238	URB	UD	XX	XX	UD	90	001	D	Final

Drawn JD Date 14/06/2024 Checked JB Scale 1:2,5000 @A1

The Urbanists - The Creative Quarter - 8A Morgan Arcade - Cardiff - CF10 1AF
T: 029 2023 6133 E: info@theurbanists.net W: www.theurbanists.net
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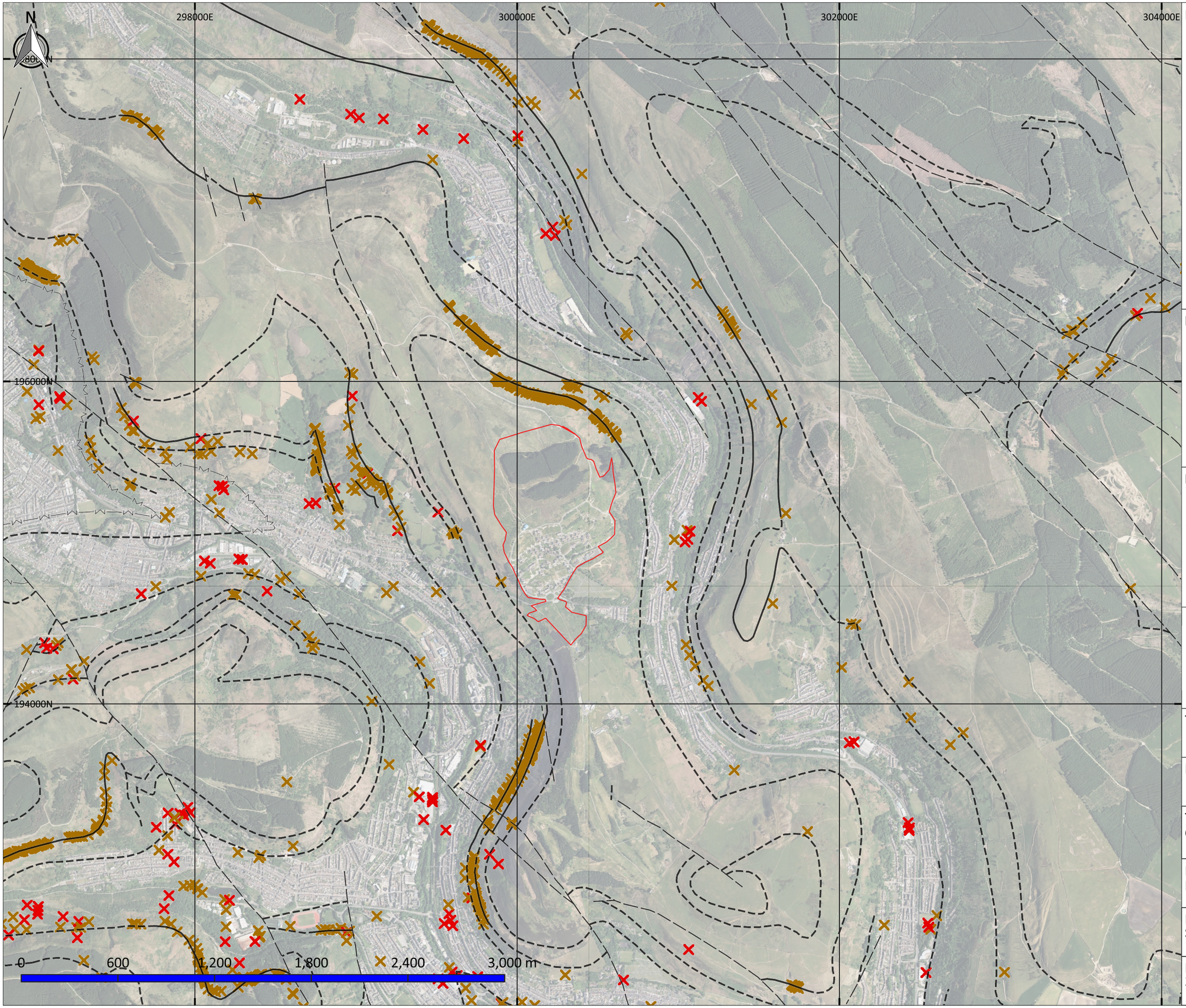


KEY PLAN

- Site Boundary
- Mine Adit (Horizontal)
- Mine Shaft (Vertical)
- Coal Seam

NOTES

1. Contains OS data © Crown copyright and database right (2021)

REVISIONS

REV.	DRAWN BY INITIALS	CHECKED BY INITIALS	DATE	REVISION NOTES/COMMENTS
P01	MH	AE	28/07/202:	First issue

Hydrock

TRIVALLIS

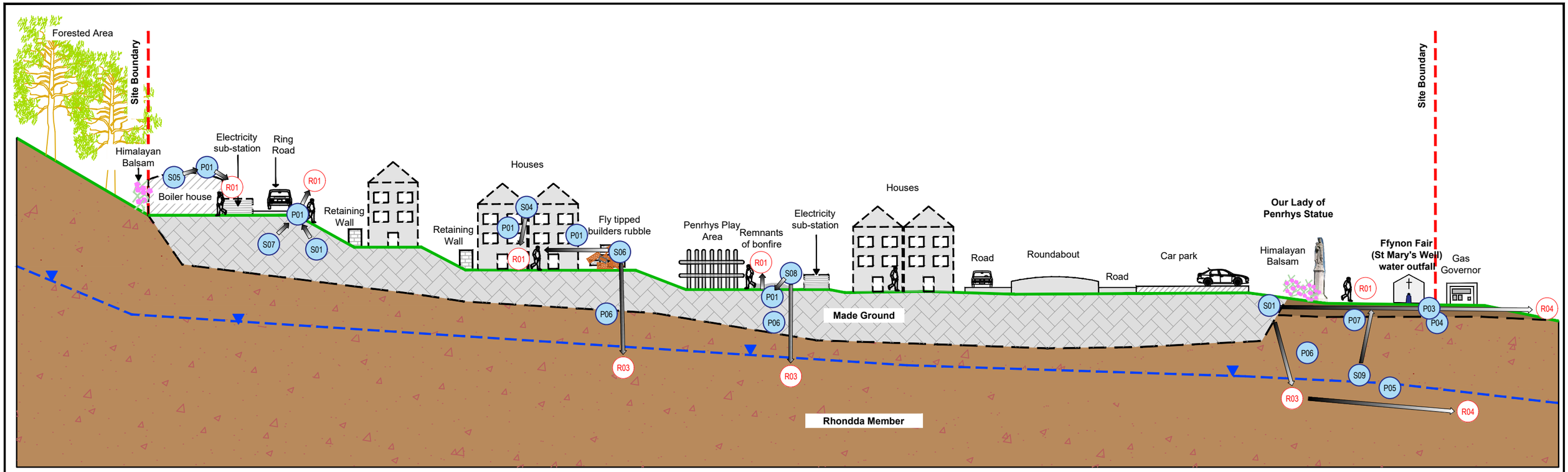
Penrhys Village, Rhondda Cynon Taff

TITLE
Coal Seam and Adit Location Plan

HYDROCK PROJECT NO. 30603	SCALE @ A3 1:22,451.957439

PURPOSE OF ISSUE SUITABLE FOR INFORMATION	STATUS S2

DRAWING NO. 30603-HYD-XX-XX-DR-GE-1001	REVISIC P01



Potential on-site sources of contamination

S01. Made Ground, associated with historical construction activities and imported fill, possibly including elevated concentrations of PAH.

~~S02. PCBs and oils from transformers in the electricity sub-stations on site.~~

~~S03. Ground gases (carbon dioxide and methane) from organic materials in the Made Ground.~~

S04. Asbestos within existing buildings / structures.

S05. Asbestos associated with the boiler house in the north of the site.

S06. Fly tipped wastes potentially including solvents, metals, metalloids, asbestos and Asbestos Containing Materials.

S07. Asbestos Containing Materials associated with gaskets on former pipe work of the district heat network.

S08. Bonfire rubble including metalloids, metals, PAHs and petroleum hydrocarbons.

S09. Petroleum Hydrocarbons and VOC/SVOC in groundwater below the site.

Potential off-site sources of contamination

No potential off-site sources of contamination have been identified.

Potential receptors

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

R01. People (neighbours, site end users).

~~R02. Development end use (buildings, utilities and landscaping).~~

R03. Groundwater: Secondary A aquifer status of the Rhondda Member.

R04. Surface water bodies: River Rhondda and the Afon Rhondda Fach.

Potential pathways

The following potential pathways have been identified.

P01. Ingestion, skin contact, inhalation of dust and outdoor air by people.

~~P02. Methane/carbon dioxide (ground gas) ingress via permeable soils and/or construction gaps.~~

P03. Surface water via overland flow.

P04. Surface water, via drainage discharge.

P05. Surface water via base flow from groundwater.

P06. Migration of contaminant via leachate migration through the unsaturated zone into the Rhondda Member.

P07. Inhalation of VOC/SVOC and petroleum hydrocarbon vapours outdoors.

KEY

- Existing ground profile
- Conjectural geological boundary
- Groundwater elevation
- Made Ground
- Topsoil
- Rhondda Member

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

REV.	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P01	FIRST ISSUE	EP	08/08/24	EW	14/08/24	AE	21/08/24

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CLIENT: TRIVALLIS

PROJECT: PENRHYS VILLAGE, RHONDDA CYNON TAFF

TITLE: FINAL CONCEPTUAL SITE MODEL

HYDROCK PROJECT NO.: C-30603

SCALE @ A3: NTS

PURPOSE OF ISSUE: SUITABLE FOR INFORMATION

STATUS: S2

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER): 30603-HYD-XX-XX-DR-GE-1016

REVISION: P01

Appendix B - Ground Gas Monitoring Data

Hydrock now Stantec

Site: Penrhys Village, Rhondda Cynon Taff
Job number: C-30603
Client: Trivallis

Gas analyser: Various
Equipment check OK: Y
Service in date: Y
Calibration check OK: Y
Name of person monitoring: GEL Visit 1-6
Hydrock Visit 7
Enitial Visit 8-9

Notes on site conditions:

Notes: * where the flow is less than the limit of detection of the instrument, the detection limit is reported. GSVs are rounded to 3 places.

Monitoring round		Borehole details						Pressure and flow					Gas concentrations								GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipie & filter pack) (m^3)	Atmospheric pressure (kPa)	Atm pressure falling / rising / steady	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow (absolute value) (l/hr)	VOC (as ppm using PID)	CH_4 (%v/v)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases Carbon Monoxide	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
														Initial	Steady	Initial	Steady	Initial	Steady				
								Max. individual values:				**0.0**			**0.2**		**2.3**		**3.9**		**0.0002**	**0.0023**	
								Min. individual values:				0.0			0.0		1.0		0.0		0.0001	0.001	**Summary statistics for this monitoring period.**
								Worst-case GSVs based on max. individual flow and max. individual conc. over the duration of this table:													**0**	**0**	
17/05/24	15:00	BH307	S	1.4 - 9.5	2.5		0.00878																Gas monitoring unable to be completed - gas tap replaced due to damage.
23/05/24	14:15	BH307	S	1.4 - 9.5	2.58		0.00914	982	R	0.00	0.1	0.0		0.0	0.0	0.9	1.2	5.9	3.9		0.0001	0.0012	Headworks flooded, water bailed out. No VOC monitoring conducted.
31/05/24	13:25	BH307	S	1.4 - 9.5	2.5		0.00878	989	R	0.00	0.1	0.0		0.0	0.0	1.2	1.4	4.6	0.9		0.0001	0.0014	No VOC monitoring conducted.
14/06/24	14:05	BH307	S	1.4 - 9.5	4.31		0.01701	966	F	0.04	0.1	0.0	99.2	0.0	0.0	0.6	1.2	16.8	0.0		0.0001	0.0012	
21/06/24	12:10	BH307	S	1.4 - 9.5	4.6		0.01833	981	F	0.00	0.1	0.0	103	0.0	0.0	0.6	1.0	20.1	0.1		0.0001	0.001	
28/06/24	12:55	BH307	S	1.4 - 9.5	6.99		0.02919	983	R	0.00	0.1	0.0	108.6	0.0	0.0	0.2	1.2	20.4	0.2	25ppm	0.0001	0.0012	Carbon monoxide initially 0ppm
24/07/24	12:50	BH307	S	1.4 - 9.5	7.7		0.03241	986	R	-1.70	0.1	0.0	33.3	0.1	0.2	0.2	1.5	20.5	0.3		0.0002	0.0015	Bailer groundwater grab sample taken.
09/08/24	09:30	BH307	S	1.4 - 9.5	8.59		0.03646	1015	S	-0.05	0.1	0.0	7.2	0.0	0.0	2.1	2.1	0.2	0.2		0.0001	0.0021	Low flow groundwater sampling completed.
02/09/24	10:40	BH307	S	1.4 - 9.5	7.6		0.03196	1010	S	0.24	0.1	0.0	0.7	0.0	0.0	2.3	2.3	2.3	2.3		0.0001	0.0023	Low flow groundwater sampling completed.

Appendix C - Chemical Test Certificates

UKAS TESTING
4041

Environmental Science

Hydrock Consultants Ltd
Wharton Place
13 Wharton Street
Cardiff CF10 1GS
CF10 1GS

e: emilywareing@hydrock.com

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7 Woodshots Meadow,
Croxley Green
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WD18 8YS

t: 01923 225404
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e: reception@i2analytical.com

Analytical Report Number : 24-032654

Project / Site name:	Penrhys	**Samples received on:**	25/07/2024
Your job number:	30603	**Samples instructed on/ Analysis started on:**	25/07/2024
Your order number:	PO35541	**Analysis completed by:**	31/07/2024
Report Issue Number:	1	**Report issued on:**	31/07/2024
Samples Analysed:	1 water sample		

Signed:

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

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 24-032654
Project / Site name: Penrhys

Your Order No: PO35541

Lab Sample Number	267716
Sample Reference	BH307
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	24/07/2024
Time Taken	None Supplied

Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	7.1
Electrical Conductivity at 20°C	µS/cm	10	ISO 17025	340
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Sulphate as SO_4	mg/l	0.045	ISO 17025	44.8
Chloride	mg/l	0.15	ISO 17025	7.2
Fluoride	µg/l	50	ISO 17025	74
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	56
Ammoniacal Nitrogen as NH_3	µg/l	15	ISO 17025	68
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	72
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	4.03
Nitrate as N	mg/l	0.01	ISO 17025	0.08
Nitrate as NO_3	mg/l	0.05	ISO 17025	0.36
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	39.1
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (Monohydric) Low Level	µg/l	1	NONE	3.6
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	0.34
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0.14
Phenanthrene	µg/l	0.01	ISO 17025	0.46
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01
PAH Sums				
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.04	NONE	< 0.040
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	0.94

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

Analytical Report Number: 24-032654
Project / Site name: Penrhys

Your Order No: PO35541

Lab Sample Number				267716
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				24/07/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	4.2
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	4.68
Barium (dissolved)	µg/l	0.06	ISO 17025	8.4
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	2.3
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	2400
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	7.6
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.3
Zinc (dissolved)	µg/l	0.5	ISO 17025	0.6
Boron (dissolved)	µg/l	10	ISO 17025	14
Calcium (dissolved)	mg/l	0.012	ISO 17025	9.5
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.056
Sodium (dissolved)	mg/l	0.01	ISO 17025	73

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Analytical Report Number: 24-032654
Project / Site name: Penrhys

Your Order No: PO35541

Lab Sample Number	267716
Sample Reference	BH307
Sample Number	None Supplied
Depth (m)	None Supplied
Date Sampled	24/07/2024
Time Taken	None Supplied

Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Petroleum Hydrocarbons				
TPH - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC10 - EC12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC12 - EC16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	190
TPH - Aliphatic >EC5 - EC35 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	190
TPH - Aliphatic >EC16 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	190
TPH - Aliphatic >EC21 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	20	NONE	190
TPH - Aliphatic >EC35 - EC40 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC35 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC40 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC5 - EC44 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	190
TPH - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC12 - EC16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	34
TPH - Aromatic >EC16 - EC21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	15
TPH - Aromatic >EC21 - EC35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC35 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	49
TPH - Aromatic >EC21 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC35 - EC40 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC35 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC40 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC44 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	49
TPH Total >EC5 - EC44 $_{HS+EH\_1D\_TOTAL\_MS}$	µg/l	10	NONE	240
VOCs				
Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0

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

Analytical Report Number: 24-032654
Project / Site name: Penrhys

Your Order No: PO35541

Lab Sample Number				267716
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				24/07/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0

Sum of m, p & o-Xylene	µg/l	3	NONE	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05

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Analytical Report Number: 24-032654
Project / Site name: Penrhys

Your Order No: PO35541

Lab Sample Number				267716
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				None Supplied
Date Sampled				24/07/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	0.87
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
3+4-Methylphenol	µg/l	0.1	NONE	< 0.10

Environmental Forensics

Formaldehyde µg/l	µg/l	100	NONE	< 100

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

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Analytical Report Number : 24-032654
Project / Site name: Penrhys

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Exotic metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031B	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Extended aldehydes in water by HPLC	Determination of Aldehydes in water by HPLC	In-house method		W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
TPH Chromatogram in water	TPH Chromatogram in water	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Chromium III in water	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080	W	ISO 17025

Analytical Report Number : 24-032654
Project / Site name: Penrhys

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide (low level) in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088B	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025
Phenols in water by GC-MS	Determination of phenols in water by GC-MS	In-house method	L102B	W	NONE
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

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

Information in Support of Analytical Results

Analytical Report Number : 24-032654
Project / Site name: Penrhys

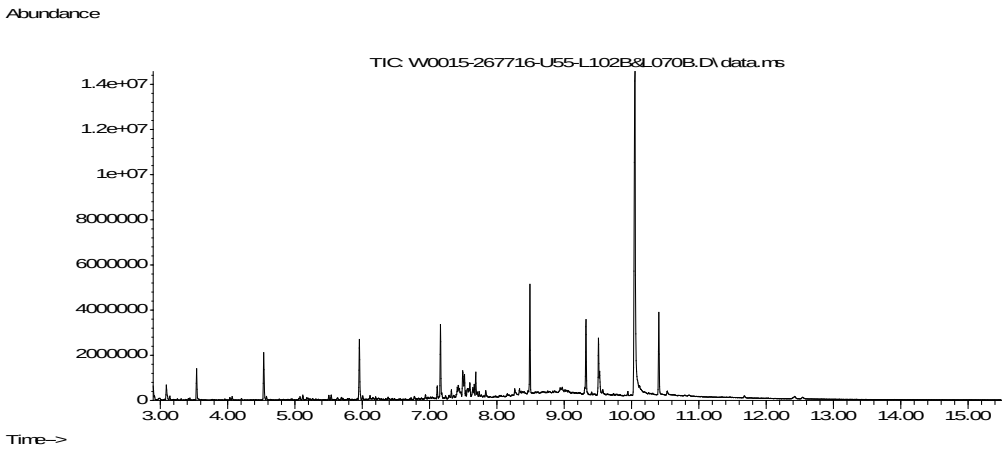
Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

List of HWOL Acronyms and Operators

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution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1e+07
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15.00
Time-->

UKAS TESTING
4041

Environmental Science

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Analytical Report Number : 24-035718

Project / Site name:	Penrhys Village	**Samples received on:**	12/08/2024
Your job number:	30603	**Samples instructed on/ Analysis started on:**	12/08/2024
Your order number:	PO35843	**Analysis completed by:**	16/08/2024
Report Issue Number:	1	**Report issued on:**	16/08/2024
Samples Analysed:	1 water sample		

Signed:

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-035718
Project / Site name: Penrhys Village

Your Order No: PO35843

Lab Sample Number	283637
Sample Reference	BH307
Sample Number	WS01
Depth (m)	None Supplied
Date Sampled	09/08/2024
Time Taken	None Supplied

Analytical Parameter (Water Analysis)	Units	Test Limit of detection	Test Accreditation Status	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	6.9
Electrical Conductivity at 20°C	µS/cm	10	ISO 17025	390
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Sulphate as SO_4	mg/l	0.045	ISO 17025	16.1
Chloride	mg/l	0.15	ISO 17025	7.4
Fluoride	µg/l	50	ISO 17025	100
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	43
Ammoniacal Nitrogen as NH_3	µg/l	15	ISO 17025	52
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	55
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	21.1
Nitrate as N	mg/l	0.01	ISO 17025	0.03
Nitrate as NO_3	mg/l	0.05	ISO 17025	0.15
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	45.9
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (Monohydric) Low Level	µg/l	1	NONE	2.2
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	0.23
Phenanthrene	µg/l	0.01	ISO 17025	0.68
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	0.16
Pyrene	µg/l	0.01	ISO 17025	0.09
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01
PAH Sums				
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.04	NONE	< 0.040
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	1.16

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Analytical Report Number: 24-035718
Project / Site name: Penrhys Village

Your Order No: PO35843

Lab Sample Number				283637
Sample Reference				BH307
Sample Number				WS01
Depth (m)				None Supplied
Date Sampled				09/08/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	29
Antimony (dissolved)	µg/l	0.4	ISO 17025	1.2
Arsenic (dissolved)	µg/l	0.15	ISO 17025	10.5
Barium (dissolved)	µg/l	0.06	ISO 17025	13
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	2.4
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	1400
Mercury (dissolved)	µg/l	0.05	ISO 17025	0.08
Nickel (dissolved)	µg/l	0.5	ISO 17025	8.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	7.6
Boron (dissolved)	µg/l	10	ISO 17025	24
Calcium (dissolved)	mg/l	0.012	ISO 17025	11
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	2.7
Sodium (dissolved)	mg/l	0.01	ISO 17025	57

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Analytical Report Number: 24-035718
Project / Site name: Penrhys Village

Your Order No: PO35843

Lab Sample Number				283637
Sample Reference				BH307
Sample Number				WS01
Depth (m)				None Supplied
Date Sampled				09/08/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Petroleum Hydrocarbons				
TPH - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC10 - EC12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC12 - EC16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC5 - EC35 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	20	NONE	< 20
TPH - Aliphatic >EC35 - EC40 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC35 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC40 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC5 - EC44 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	16
TPH - Aromatic >EC12 - EC16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	40
TPH - Aromatic >EC16 - EC21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	50
TPH - Aromatic >EC21 - EC35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	20
TPH - Aromatic >EC5 - EC35 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	130
TPH - Aromatic >EC21 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	20
TPH - Aromatic >EC35 - EC40 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC35 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC40 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC44 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	130
TPH Total >EC5 - EC44 $_{HS+EH\_1D\_TOTAL\_MS}$	µg/l	10	NONE	130
VOCs				
Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0

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Analytical Report Number: 24-035718
Project / Site name: Penrhys Village

Your Order No: PO35843

Lab Sample Number				283637
Sample Reference				BH307
Sample Number				WS01
Depth (m)				None Supplied
Date Sampled				09/08/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Dichloromethane	µg/l	3	NONE	< 3.0
Tetrachloroethane	µg/l	3	NONE	< 3.0
Total Trihalomethanes	µg/l	12	NONE	< 12
Total Trichlorobenzenes	µg/l	9	NONE	< 9.0
Total Dichlorobenzenes	µg/l	9	NONE	< 9.0
Trichloroethylene (TCE) + Tetrachloroethylene (PCE)	µg/l	2	NONE	< 2.0
Total 1,2-Dichloroethene	µg/l	6	NONE	< 6.0
Total 1,3-Dichloropropene	µg/l	6	NONE	< 6.0
Sum of m, p & o-Xylene	µg/l	3	NONE	< 3.0

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Analytical Report Number: 24-035718
Project / Site name: Penrhys Village

Your Order No: PO35843

Lab Sample Number				283637
Sample Reference				BH307
Sample Number				WS01
Depth (m)				None Supplied
Date Sampled				09/08/2024
Time Taken				None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
SVOCs				
Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	7.46
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	0.58
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	0.36
Anthraquinone	µg/l	0.05	NONE	< 0.05
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
3+4-Methylphenol	µg/l	0.1	NONE	7.5

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

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Analytical Report Number : 24-035718
Project / Site name: Penrhys Village

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Exotic metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031B	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
TPH Chromatogram in water	TPH Chromatogram in water	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Volatile organic compounds in water extended	Determination of volatile organic compounds in water by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	NONE
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078	W	ISO 17025
Chromium III in water	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080	W	ISO 17025

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Analytical Report Number : 24-035718
Project / Site name: Penrhys Village

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Total cyanide (low level) in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088B	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025
Phenols in water by GC-MS	Determination of phenols in water by GC-MS	In-house method	L102B	W	NONE
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

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

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Analytical Report Number : 24-035718
Project / Site name: Penrhys Village

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

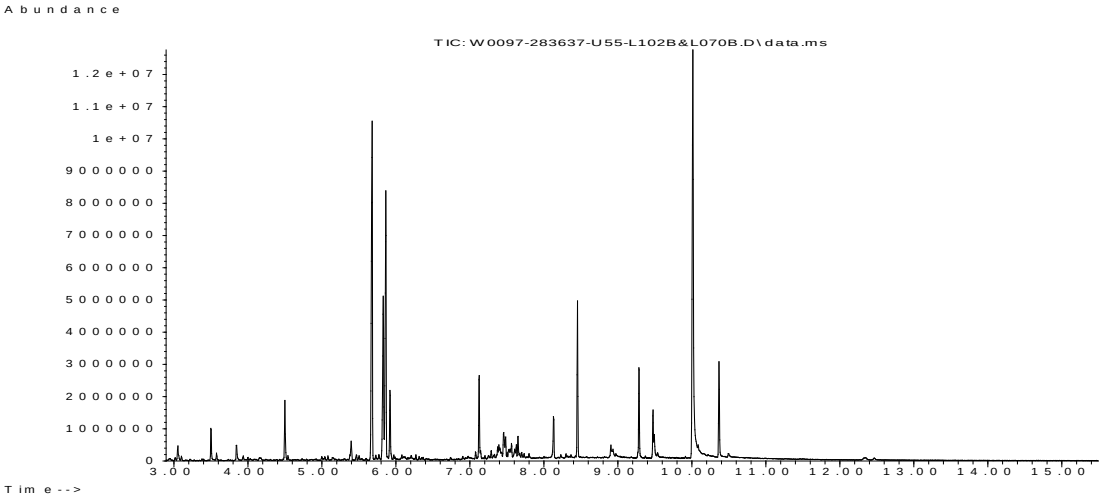
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution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1e+07
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UKAS TESTING
4041

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Analytical Report Number : 24-040066

Project / Site name:	Penrhys	**Samples received on:**	03/09/2024
Your job number:	30603	**Samples instructed on/ Analysis started on:**	04/09/2024
Your order number:	PO36344	**Analysis completed by:**	11/09/2024
Report Issue Number:	1	**Report issued on:**	11/09/2024
Samples Analysed:	1 water sample		

Signed:

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

Analytical Report Number: 24-040066
Project / Site name: Penrhys

Your Order No: PO36344

Lab Sample Number	305814
Sample Reference	BH307
Sample Number	None Supplied
Depth (m)	7.60-9.21
Date Sampled	02/09/2024
Time Taken	1142

Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
General Inorganics				
pH (L099)	pH Units	N/A	ISO 17025	6.7
Electrical Conductivity at 20°C	µS/cm	10	ISO 17025	200
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Sulphate as SO_4	mg/l	0.045	ISO 17025	29.7
Chloride	mg/l	0.15	ISO 17025	4.8
Fluoride	µg/l	50	ISO 17025	54
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	16
Ammoniacal Nitrogen as NH_3	µg/l	15	ISO 17025	20
Ammoniacal Nitrogen as NH_4^+	µg/l	15	ISO 17025	21
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	1.59
Nitrate as N	mg/l	0.01	ISO 17025	0.01
Nitrate as NO_3	mg/l	0.05	ISO 17025	0.05
Nitrite as NO_2	µg/l	5	ISO 17025	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	31.2
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (Monohydric) Low Level	µg/l	1	NONE	< 1.0
Speciated PAHs				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01
PAH Sums				
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.02	NONE	< 0.020
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.04	NONE	< 0.040
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16

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Analytical Report Number: 24-040066
Project / Site name: Penrhys

Your Order No: PO36344

Lab Sample Number	305814
Sample Reference	BH307
Sample Number	None Supplied
Depth (m)	7.60-9.21
Date Sampled	02/09/2024
Time Taken	1142

Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	1	ISO 17025	6.8
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.53
Barium (dissolved)	µg/l	0.06	ISO 17025	9.2
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3
Cobalt (dissolved)	µg/l	0.2	ISO 17025	5.6
Copper (dissolved)	µg/l	0.5	ISO 17025	3.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Manganese (dissolved)	µg/l	0.05	ISO 17025	4400
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	10
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	0.82
Tin (dissolved)	µg/l	0.2	ISO 17025	0.72
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.9
Boron (dissolved)	µg/l	10	ISO 17025	12
Calcium (dissolved)	mg/l	0.012	ISO 17025	7.8
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Iron (dissolved)	mg/l	0.004	ISO 17025	0.35
Sodium (dissolved)	mg/l	0.01	ISO 17025	40

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Environmental Science

Analytical Report Number: 24-040066
Project / Site name: Penrhys

Your Order No: PO36344

Lab Sample Number				305814
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				7.60-9.21
Date Sampled				02/09/2024
Time Taken				1142
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Petroleum Hydrocarbons				
TPH - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	µg/l	1	ISO 17025	< 1.0
TPH - Aliphatic >EC10 - EC12 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC12 - EC16 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC21 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC5 - EC35 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC16 - EC35 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC21 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	20	NONE	< 20
TPH - Aliphatic >EC35 - EC40 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC35 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC40 - EC44 $_{EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aliphatic >EC5 - EC44 $_{HS+EH\_1D\_AL\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	µg/l	1	ISO 17025	< 1.0
TPH - Aromatic >EC10 - EC12 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC12 - EC16 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC16 - EC21 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC21 - EC35 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC35 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC21 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC35 - EC40 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC35 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC40 - EC44 $_{EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH - Aromatic >EC5 - EC44 $_{HS+EH\_1D\_AR\_MS}$	µg/l	10	NONE	< 10
TPH Total >EC5 - EC44 $_{HS+EH\_1D\_TOTAL\_MS}$	µg/l	10	NONE	< 10
VOCs				
Chloromethane	µg/l	3	ISO 17025	< 3.0
Chloroethane	µg/l	3	ISO 17025	< 3.0
Bromomethane	µg/l	3	ISO 17025	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0
1,1-Dichloroethene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	ISO 17025	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	ISO 17025	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	ISO 17025	< 3.0
1,1-Dichloroethane	µg/l	3	ISO 17025	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0
Chloroform	µg/l	3	ISO 17025	< 3.0
1,1,1-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,2-Dichloroethane	µg/l	3	ISO 17025	< 3.0
1,1-Dichloropropene	µg/l	3	ISO 17025	< 3.0
Cis-1,2-dichloroethene	µg/l	3	ISO 17025	< 3.0
Benzene	µg/l	3	ISO 17025	< 3.0
Carbontetrachloride	µg/l	3	ISO 17025	< 3.0
1,2-Dichloropropane	µg/l	3	ISO 17025	< 3.0

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Analytical Report Number: 24-040066
Project / Site name: Penrhys

Your Order No: PO36344

Lab Sample Number				305814
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				7.60-9.21
Date Sampled				02/09/2024
Time Taken				1142
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Trichloroethene	µg/l	3	ISO 17025	< 3.0
Dibromomethane	µg/l	3	ISO 17025	< 3.0
Bromodichloromethane	µg/l	3	ISO 17025	< 3.0
Cis-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Trans-1,3-dichloropropene	µg/l	3	ISO 17025	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0
1,1,2-Trichloroethane	µg/l	3	ISO 17025	< 3.0
1,3-Dichloropropane	µg/l	3	ISO 17025	< 3.0
Dibromochloromethane	µg/l	3	ISO 17025	< 3.0
Tetrachloroethene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromoethane	µg/l	3	ISO 17025	< 3.0
Chlorobenzene	µg/l	3	ISO 17025	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	ISO 17025	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0
Styrene	µg/l	3	ISO 17025	< 3.0
Bromoform	µg/l	3	ISO 17025	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0
Isopropylbenzene	µg/l	3	ISO 17025	< 3.0
1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0
Bromobenzene	µg/l	3	ISO 17025	< 3.0
n-Propylbenzene	µg/l	3	ISO 17025	< 3.0
2-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
4-Chlorotoluene	µg/l	3	ISO 17025	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
tert-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	ISO 17025	< 3.0
sec-Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,3-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
p-Isopropyltoluene	µg/l	3	ISO 17025	< 3.0
1,4-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dichlorobenzene	µg/l	3	ISO 17025	< 3.0
Butylbenzene	µg/l	3	ISO 17025	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	ISO 17025	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Hexachlorobutadiene	µg/l	3	ISO 17025	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	ISO 17025	< 3.0
Dichloromethane	µg/l	3	NONE	< 3.0
Tetrachloroethane	µg/l	3	NONE	< 3.0
Total Trihalomethanes	µg/l	12	NONE	< 12
Total Trichlorobenzenes	µg/l	9	NONE	< 9.0
Total Dichlorobenzenes	µg/l	9	NONE	< 9.0
Trichloroethylene (TCE) + Tetrachloroethylene (PCE)	µg/l	2	NONE	< 2.0
Total 1,2-Dichloroethene	µg/l	6	NONE	< 6.0
Total 1,3-Dichloropropene	µg/l	6	NONE	< 6.0
Sum of m, p & o-Xylene	µg/l	3	NONE	< 3.0

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Analytical Report Number: 24-040066
Project / Site name: Penrhys

Your Order No: PO36344

Lab Sample Number				305814
Sample Reference				BH307
Sample Number				None Supplied
Depth (m)				7.60-9.21
Date Sampled				02/09/2024
Time Taken				1142
Analytical Parameter (Water Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
SVOCs				
Aniline	µg/l	0.05	NONE	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05
Azobenzene	µg/l	0.05	NONE	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05
Carbazole	µg/l	0.05	NONE	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05
3+4-Methylphenol	µg/l	0.1	NONE	< 0.10

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

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Analytical Report Number : 24-040066
Project / Site name: Penrhys

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Bromate in water by IC	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Exotic metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW	In-house method based on USEPA Method 6020 & 200.8 for the determination of trace elements in water by ICP-MS	L012B	W	ISO 17025
Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031B	W	ISO 17025
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW PW, GW	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved organic carbon in water by TOC/DOC NDIR Analyser	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037B	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices: SW, GW, PW, PrW (Al, Cu, Fe,Zn)	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045B	W	ISO 17025
Total petroleum hydrocarbons with carbon banding by GC-MS in water	Determination of total petroleum hydrocarbons in water by GC-MS/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L070B	W	NONE
TPH Chromatogram in water	TPH Chromatogram in water	In-house method	L070B	W	NONE
BTEX and/or Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA 8260	L073B	W	ISO 17025
Volatile organic compounds in water extended	Determination of volatile organic compounds in water by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	NONE
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	ISO 17025
Chromium III in water	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW	L080-PL	W	ISO 17025

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Analytical Report Number : 24-040066
Project / Site name: Penrhys

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Monohydric phenols (low level) in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Total cyanide (low level) in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Chloride in water	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW,PW, GW,FSE,LL	L082B	W	ISO 17025
Ammonia as NH3 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Total petroleum hydrocarbons by GC-MS HS in water	Determination of total petroleum hydrocarbons in water by GC-MS HS	In-house method	L088-PL	W	ISO 17025
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds (including PAH) in leachate by extraction in dichloromethane followed by GC-MS	In-house method based on USEPA 8270	L102B	W	ISO 17025
Phenols in water by GC-MS	Determination of phenols in water by GC-MS	In-house method	L102B	W	NONE
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW, FSE, LL	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW, LL	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025

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

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Analytical Report Number : 24-040066
Project / Site name: Penrhys

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

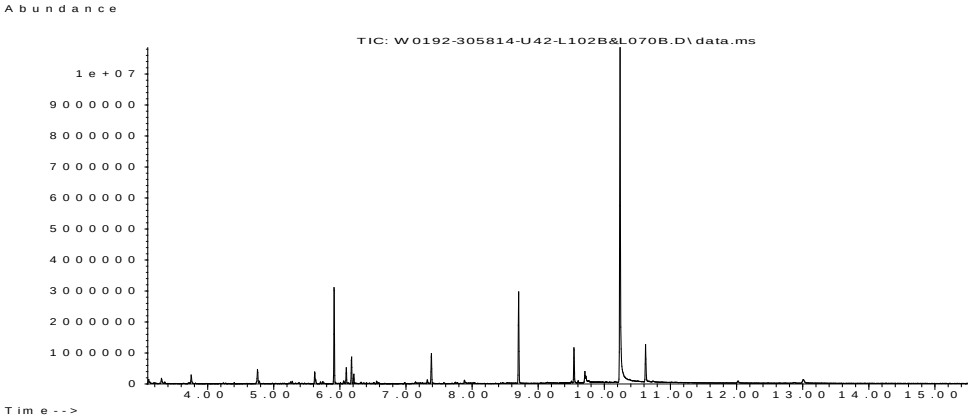
Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status

Information in Support of Analytical Results

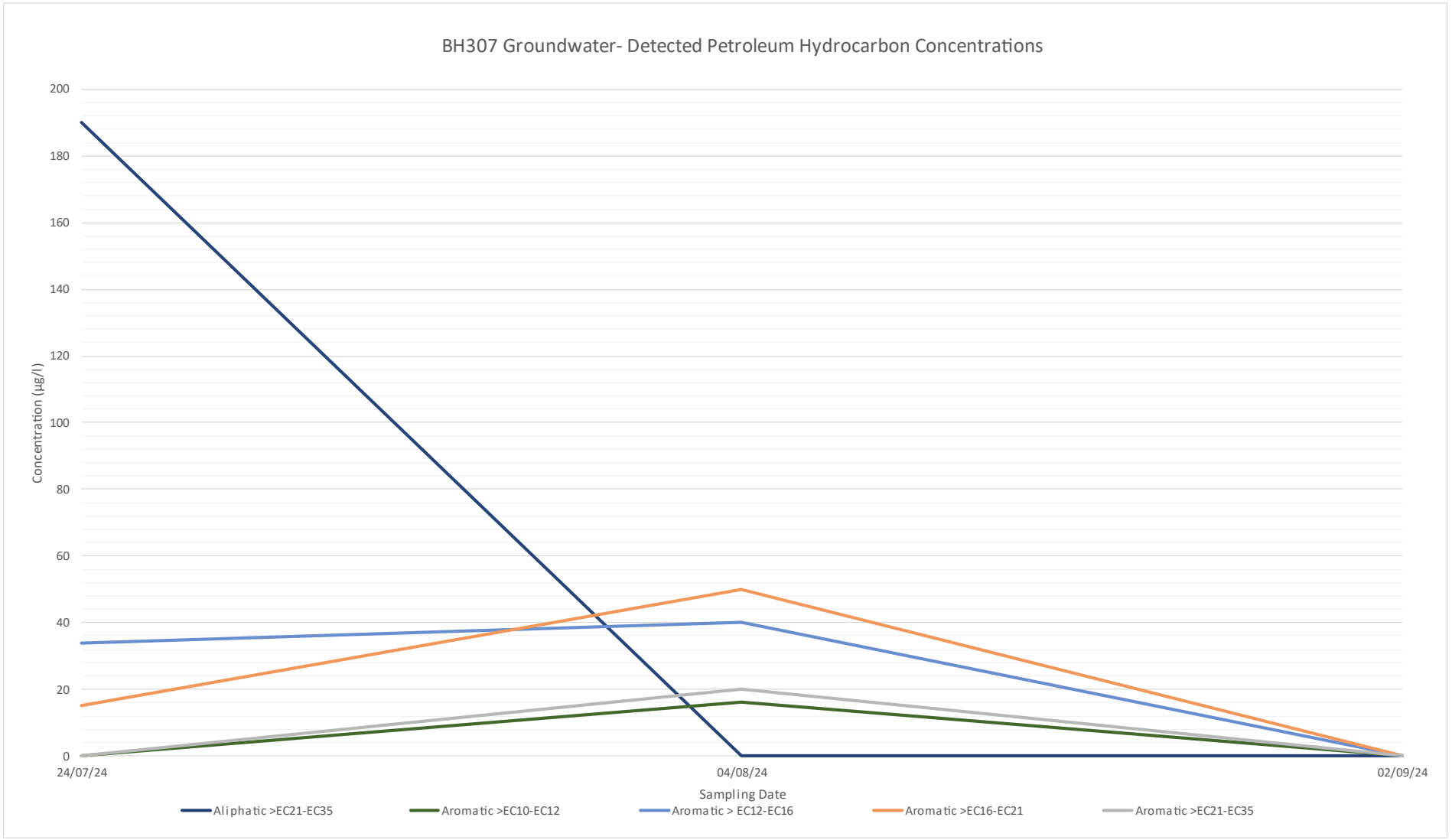
List of HWOL Acronyms and Operators

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

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


Abundance
TIC: W0192-305814-U42-L102B&L070B.D\data.ms
1e+07
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
Time-->

Appendix D - Groundwater Monitoring Data


BH307 Groundwater- Detected Petroleum Hydrocarbon Concentrations
200
180
160
140
120
100
80
60
40
20
0
Concentration (µg/l)
24/07/24
04/08/24
02/09/24
Sampling Date
Aliphatic >EC21-EC35
Aromatic >EC10-EC12
Aromatic > EC12-EC16
Aromatic >EC16-EC21
Aromatic >EC21-EC35

Appendix E - Groundwater Risk Assessment

Risk Assessment of Groundwater Data

Scenario Controlled Waters (England & Wales)
Assessment Level RTM Level 2 - Groundwater Beneath Source Assessment - groundwater samples
Data set: Groundwater
Client: Trivallis
Site: Penrhys Village
Job no: C30603
Lab. report no(s).: 24-032654 , 24-035718-1 and 24-040066-1

Hydrock now Stantec

Data Filters
Zone: All Zones
Strata Filter: All Strata
Date Min: 24/07/2024
Date Max: 02/09/2024

Results Shading Key

123*	Exceeds solubility value
<1	Grey text and "<" sign if value <= LoD
50	Exceeds screening value
500	Exceeds 10 x screening value

Zone	1	1	1
Screened Strata	Rhondda Member	Rhondda Member	Rhondda Member
Date	24/07/24	04/08/24	02/09/24
Sampling Round	1	2	3
Location	BH307	BH307	BH307

CAS / AGS Number	Determinand	EQS Category (Determinand Designations)	Hazardous Substance Status	Solubility Limit (µg/l)	Units (Sample Summaries)	Limit of Detection (LoD)	No. of Samples	No. of Samples > LoD	Min	Max	EQS (inland) (England and Wales) (Water Quality Target (WQT), Exceeded if Red Text)		Screening Value (minimum of WQT)	No. Samples > WQT	No. Samples above LoD > WQT	Location	BH307 (24/07/24)	BH307 (04/08/24)	BH307 (02/09/24)
P1133	Hardness as mg/l $CaCO_3$				mgCaCO3/l	0	3	3	31.2	45.9	-	-	-	-	-		39.1	45.9	31.2
P1134	pH (min.) (su)	O			pH Units		0				6	h	6	0	0				
P1134	pH (max.) (su)	O			pH Units	0	3	3	6.7	7.1	9	h	9	0	0		7.1	6.9	6.7
P1287	Electrical conductivity (µS/cm)				µS/cm	0	3	3	200	390	-	-	-	-	-		340	390	200
P1095	Cyanide (free) (hydrogen cyanide)	SP	NP		µg/l	1	3	0	<1	<1	1	h	1	0	0		<1	<1	<1
57-12-5	Cyanide (total)				µg/l	1	3	0	<1	<1	-	-	-	-	-		<1	<1	<1
P1839	Dissolved Organic Carbon (DOC) [mg/l]				mg/l	0.1	3	3	1.59	21.1	-	-	-	-	-		4.03	21.1	1.59
P1140	Ammonium (NH_4^+)		NP		µg/l	15	3	3	21	72	-	-	-	-	-		72	55	21
P1238	Ammnoniacal Nitrogen (as N)		NP		µg/l	15	3	3	16	56	300	g	300	0	0		56	43	16
P1720	Ammonia (unionised) (NH_3 as N) [free ammonia]	SP	NP		µg/l	15	3	3	20	68	-	h	-	-	-		68	52	20
15541-45-4	Bromate (BrO_3)				mg/l	0.002	3	0	<0.002	<0.002	-	-	-	-	-		<0.002	<0.002	<0.002
16887-00-6	Chloride (Cl^-)	O			mg/l	0.15	3	3	4.8	7.4	250	h	250	0	0		7.2	7.4	4.8
16984-48-8	Fluoride (F^-)	O			µg/l	50	3	3	54	100	1000	h	1000	0	0		74	100	54
P1348	Nitrate (NO_3^-)				mg/l	0.05	3	2	<0.05	0.36	-	-	-	-	-		0.36	0.15	<0.05
P1349	Nitrite (NO_2^-)				µg/l	5	3	0	<5	<5	-	-	-	-	-		<5	<5	<5
14808-79-8	Sulfate (SO_4^{2-})	O			mg/l	0.045	3	3	16.1	44.8	400	h	400	0	0		44.8	16.1	29.7
7429-90-5	Aluminium (Al) (dissolved)				µg/l	1	3	3	4.2	29	-	-	-	-	-		4.2	29	6.8
7440-36-0	Antimony (Sb) (dissolved)		NP		µg/l	0.4	3	2	<0.4	1.2	-	-	-	-	-		0.6	1.2	<0.4
7440-38-2	Arsenic (As) (dissolved)	SP	H		µg/l	0.15	3	3	1.53	10.5	50	h	50	0	0		4.68	10.5	1.53
7440-39-3	Barium (Ba) (dissolved)				µg/l	0.06	3	3	8.4	13	-	-	-	-	-		8.4	13	9.2
7440-42-8	Boron (B) (dissolved)	O	NP		µg/l	10	3	3	12	24	2000	h	2000	0	0		14	24	12
7440-43-9	Cadmium (Cd) (dissolved)	PHS	NP		µg/l	0.02	3	0	<0.02	<0.02	0.08	h	0.08	0	0		<0.02	<0.02	<0.02
7440-70-2	Calcium (Ca) (dissolved)				mg/l	0.012	3	3	7.8	11	-	-	-	-	-		9.5	11	7.8
16065-83-1	Chromium (Cr III) (dissolved)	SP			µg/l	5	3	0	<5	<5	4.7	h	4.7	3	0		<5	<5	<5
18540-29-9	Chromium (Cr VI) (dissolved)	SP	H		µg/l	5	3	0	<5	<5	3.4	h	3.4	3	0		<5	<5	<5
7440-47-3	Chromium (Cr) (dissolved)				µg/l	0.2	3	1	<0.2	0.3	-	-	-	-	-		<0.2	<0.2	0.3
7440-48-4	Cobalt (Co) (dissolved)	O	NP		µg/l	0.2	3	3	2.3	5.6	3	h	3	1	1		2.3	2.4	5.6
7440-50-8	Copper (Cu) (dissolved)	SP	NP		µg/l	0.5	3	0	0.2	<0.5	1	h	1	0	0		<0.5	<0.5	<0.2
7439-89-6	Iron (Fe) (dissolved)	SP			mg/l	0.004	3	3	0.056	2.7	1	h	1	1	1		0.056	2.7	0.35
7439-92-1	Lead (Pb) (dissolved)	PS	H		µg/l	0.2	3	0	<0.2	<0.2	1.2	h	1.2	0	0		<0.2	<0.2	<0.2
7439-95-4	Magnesium (Mg) (dissolved)						0				-	-	-	-	-				
P1286	Manganese (Mn) (dissolved)	SP			µg/l	0.05	3	3	1400	4400	123	h	123	3	3		2400	1400	4400
7439-97-6	Mercury (Hg) (dissolved)	PHS	H	56	µg/l	0.05	3	1	<0.05	0.08	0.07	h	0.07	1	1		<0.05	0.08	<0.05
7440-02-0	Nickel (Ni) (dissolved)	PS	NP		µg/l	0.5	3	3	7.6	10	4	h	4	3	3		7.6	8.5	10
7782-49-2	Selenium (Se) (dissolved)		NP		µg/l	0.6	3	0	<0.6	<0.6	-	-	-	-	-		<0.6	<0.6	<0.6
7440-22-4	Silver (Ag) (dissolved)	O			µg/l	0.05	3	1	<0.05	0.82	0.05	h	0.05	1	1		<0.05	<0.05	0.82
7440-23-5	Sodium (Na) (dissolved)				mg/l	0.01	3	3	40	73	-	-	-	-	-		73	57	40
7440-31-5	Tin (Sn) (dissolved)	O			µg/l	0.2	3	1	<0.2	0.72	25	h	25	0	0		<0.2	<0.2	0.72
7440-62-2	Vanadium (V) (dissolved)	O			µg/l	0.2	3	1	<0.2	0.3	20	h	20	0	0		0.3	<0.2	<0.2
7440-66-6	Zinc (Zn) (dissolved)	SP	NP		µg/l	0.5	3	3	0.6	7.6	10.9	h	10.9	0	0		0.6	7.6	4.9
83-32-9	Acenaphthene		H	4110	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
208-96-8	Acenaphthylene			7950	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
120-12-7	Anthracene	PHS	H	56	µg/l	0.01	3	0	<0.01	<0.01	0.1	h	0.1	0	0		<0.01	<0.01	<0.01
56-55-3	Benzo(a)anthracene			3.8	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
50-32-8	Benzo(a)pyrene	PHS	H	3.8	µg/l	0.01	3	0	<0.01	<0.01	0.00017	h	0.00017	3	0		<0.01	<0.01	<0.01
205-99-2	Benzo(b)fluoranthene	PHS	H	2	µg/l	0.01	3	0	<0.01	<0.01	0.017	h	0.017	0	0		<0.01	<0.01	<0.01
191-24-2	Benzo(ghi)perylene	PHS	H	0.26	µg/l	0.01	3	0	<0.01	<0.01	0.0082	h	0.0082	3	0		<0.01	<0.01	<0.01
207-08-9	Benzo(k)fluoranthene	PHS	H	0.8	µg/l	0.01	3	0	<0.01	<0.01	0.017	h	0.017	0	0		<0.01	<0.01	<0.01
218-01-9	Chrysene			2	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
53-70-3	Dibenz(a,h)anthracene			0.6	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
206-44-0	Fluoranthene	PS	H	230	µg/l	0.01	3	1	<0.01	0.16	0.0063	h	0.0063	3	1		<0.01	0.16	<0.01
86-73-7	Fluorene			1860	µg/l	0.01	3	2	<0.01	0.23	-	-	-	-	-		0.14	0.23	<0.01
193-39-5	Indeno(1,2,3-cd)pyrene	PHS	H	0.2	µg/l	0.01	3	0	<0.01	<0.01	-	-	-	-	-		<0.01	<0.01	<0.01
91-20-3	Naphthalene	PS	NP	19000	µg/l	0.01	3	1	<0.01	0.34	2	h	2	0	0		0.34	<0.01	<0.01
85-01-8	Phenanthrene			1120	µg/l	0.01	3	2	<0.01	0.68	-	-	-	-	-		0.46	0.68	<0.01
129-00-0	Pyrene			130	µg/l	0.01	3	1	<0.01	0.09	-	-	-	-	-		<0.01	0.09	<0.01
GRP01	PAHs - sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene	PHS	H		µg/l	0.04	3	0	<0.04	<0.04	-	-	-	-	-		<0.04	<0.04	<0.04
P1877	Total Phenols	SP	NP	84100000	µg/l	1	3	2	<1	3.6	7.7	h	7.7	0	0		3.6	2.2	<1
P1407	Aliphatic >EC5-EC6			35900	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1408	Aliphatic >EC6-EC8			5370	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1409	Aliphatic >EC8-EC10			427	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1410	Aliphatic >EC10-EC12			33.9	µg/l	10	3	0	<10	<10	10	j	10	0	0		<10	<10	<10
P1411	Aliphatic >EC12-EC16			0.759	µg/l	10	3	0	<10	<10	10	j	10	0	0		<10	<10	<10
P1412	Aliphatic >EC16-EC21				µg/l	10	3	0	<10	<10	-	-	-	-	-		<10	<10	<10
P1413	Aliphatic >EC21-EC35				µg/l	10	3	1	<10	190	-	-	-	-	-		190	<10	<10
P1938	Aliphatic >EC16-EC35			0.00254	µg/l	10	3	1	<10	190	10	j	10	1	1		190 *	<10	<10
P1415	Aliphatic >EC35-EC44			0.00254	µg/l	10	3	0	<10	<10	10	j	10	0	0		<10	<10	<10
P1418	Aliphatic >EC5-EC35				µg/l	10	3	1	<10	190	-	-	-	-	-		190	<10	<10
P1420	Aliphatic >EC5-EC44				µg/l	10	3	1	<10	190	-	-	-	-	-		190	<10	<10
P1441	Aromatic EC5-EC7			1780000	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1355	Aromatic >EC7-EC8			590000	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1356	Aromatic >EC8-EC10			64600	µg/l	1	3	0	<1	<1	10	j	10	0	0		<1	<1	<1
P1357	Aromatic >EC10-EC12			24500	µg/l	10	3	1	<10	16	10	j	10	1	1		<10	16	<10
P1358	Aromatic > EC12-EC16			5750	µg/l	10	3	2	<10	40	10	j	10	2	2		34	40	<10
P1359	Aromatic >EC16-EC21			653	µg/l	10	3	2	<10	50	10	j	10	2	2		15	50	<10
P1360	Aromatic >EC21-EC35			6.61	µg/l	10	3	1	<10	20	10	j	10	1	1		<10	20 *	<10
P1362	Aromatic >EC35-EC44			6.61	µg/l	10	3	0	<10	<10	10	j	10	0	0		<10	<10	<10
P1365	Aromatic >EC5-EC35				µg/l	10	3	2	<10	130	-	-	-	-	-		49	130	<10
P1941	Aromatic >EC5-EC44				µg/l	10	3	2	<10	130	-	-	-	-	-		49	130	<10
P1373	TPH EC5-44				µg/l	10	3	2	<10	240	-	-	-	-	-		240	130	<10
71-43-2	Benzene	PS	H	1780000	µg/l	3	3	0	<3	<3	10	h	10	0	0		<3	<3	<3
108-88-3	Toluene	SP	H	590000	µg/l	3	3	0	<3	<3	74	h	74	0	0		<3	<3	<3
100-41-4	Ethylbenzene		H	180000	µg/l	3	3	0	<3	<3	20	i	20	0	0		<3	<3	<3
P1374	m,p-Xylene	O	H	200000	µg/l	3	3	0	<3	<3	30	h	30	0	0		<3	<3	<3
95-47-6	o-Xylene	O	H	173000	µg/l	3	3	0	<3	<3	30	h	30	0	0		<3	<3	<3
1634-04-4	Methyl tertiary butyl ether (MTBE)		NP	48000000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
P1092	m,p,o-Xylene (sum)	O	H		µg/l	3	3	0	<3	<3	30	h	30	0	0		<3	<3	<3
630-20-6	1,1,1,2-Tetrachloroethane		H	1110000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
71-55-6	1,1,1-Trichloroethane	O	NP	1300000	µg/l	3	3	0	<3	<3	100	h	100	0	0		<3	<3	<3
79-34-5	1,1,2,2-Tetrachloroethane		H	2930000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
76-13-1	1,1,2-Trichloro 1,2,2-Trifluoroethane		H		µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
79-00-5	1,1,2-Trichloroethane	O	NP	4490000	µg/l	3	3	0	<3	<3	400	h	400	0	0		<3	<3	<3
75-34-3	1,1-Dichloroethane		NP	3666000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
75-35-4	1,1-Dichloroethene		NP	3100000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
563-58-6	1,1-Dichloropropene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
87-61-6	1,2,3-Trichlorobenzene			21000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
120-82-1	1,2,4-Trichlorobenzene		H	41400	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
95-63-6	1,2,4-Trimethylbenzene		H	559000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
96-12-8	1,2-Dibromo-3-chloropropane			1230000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
106-93-4	1,2-Dibromoethane		H	4300000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
95-50-1	1,2-Dichlorobenzene		H	133000	µg/l	3	3	0	<3	<3	20	h	20	0	0		<3	<3	<3
107-06-2	1,2-Dichloroethane (EDC)	PS	NP	8680000	µg/l	3	3	0	<3	<3	10	h	10	0	0		<3	<3	<3
78-87-5	1,2-Dichloropropane		H	2050000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
108-67-8	1,3,5-Trimethylbenzene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
541-73-1	1,3-Dichlorobenzene		H	103000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
142-28-9	1,3-Dichloropropane		H		µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
106-46-7	1,4-Dichlorobenzene		H	51200	µg/l	3	3	0	<3	<3	20	h	20	0	0		<3	<3	<3
594-20-7	2,2-Dichloropropane				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
95-49-8	2-Chlorotoluene		H		µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
106-43-4	4-Chlorotoluene		H		µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
108-86-1	Bromobenzene			388040	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
75-27-4	Bromodichloromethane			3000000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
74-83-9	Bromomethane				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
104-51-8	Butylbenzene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
108-90-7	Chlorobenzene		H	387000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
75-00-3	Chloroethane			5742000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
74-87-3	Chloromethane			5350000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
156-59-2	cis 1,2-Dichloroethene (cis 1,2 DCE)		NP	7550000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
10061-01-5	cis 1,3-Dichloropropene		H	2700000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
124-48-1	Dibromochloromethane			1050000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
74-95-3	Dibromomethane				µg/l	3	3	0	0	0	-	-	-	-	-		<3	<3	<3
87-68-3	Hexachlorobutadiene (HCBD)	PHS	H	4800	µg/l	3	3	0	<3	<3	0.6	h	0.6	3	0		<3	<3	<3
98-82-8	Isopropylbenzene			56000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
103-65-1	n-Propylbenzene			54100	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
99-87-6	p-Isopropyltoluene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
135-98-8	sec-Butylbenzene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
100-42-5	Styrene	O	H	290000	µg/l	3	3	0	<3	<3	50	h	50	0	0		<3	<3	<3
98-06-6	tert-Butylbenzene				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
127-18-4	Tetrachloroethene (PCE)	OP	NP	225000	µg/l	3	3	0	<3	<3	10	h	10	0	0		<3	<3	<3
56-23-5	Tetrachloromethane (Carbon Tetrachloride)	OP	H	846000	µg/l	3	3	0	<3	<3	12	h	12	0	0		<3	<3	<3
156-60-5	trans 1,2-Dichloroethene (trans 1,2 DCE)		NP	5250000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
10061-02-6	trans 1,3-Dichloropropene		H	2800000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
75-25-2	Tribromomethane (bromoform)			3000000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
79-01-6	Trichloroethene (TCE)	OP	H	1370000	µg/l	3	3	0	<3	<3	10	h	10	0	0		<3	<3	<3
75-69-4	Trichlorofluoromethane (CFC-11)				µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
67-66-3	Trichloromethane (chloroform)	PS	H	8950000	µg/l	3	3	0	<3	<3	2.5	h	2.5	3	0		<3	<3	<3
75-01-4	Vinyl chloride (chloroethene) (VC)		H	2760000	µg/l	3	3	0	<3	<3	-	-	-	-	-		<3	<3	<3
95-95-4	2,4,5-Trichlorophenol		H		µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
88-06-2	2,4,6-Trichlorophenol		H	434000	µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
120-83-2	2,4-Dichlorophenol	SP	H	4500000	µg/l	0.05	3	0	<0.05	<0.05	4.2	h	4.2	0	0		<0.05	<0.05	<0.05
105-67-9	2,4-Dimethylphenol				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
121-14-2	2,4-Dinitrotoluene				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
606-20-2	2,6-Dinitrotoluene				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
91-58-7	2-Chloronaphthalene			11700	µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
95-57-8	2-Chlorophenol	O	H	22700000	µg/l	0.05	3	0	<0.05	<0.05	50	h	50	0	0		<0.05	<0.05	<0.05
91-57-6	2-Methylnaphthalene				µg/l	0.05	3	2	<0.05	0.87	-	-	-	-	-		0.87	0.58	<0.05
95-48-7	2-Methylphenol		NP		µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
88-75-5	2-Nitrophenol				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
P1846	3&4 Methylphenol				µg/l	0.1	3	1	<0.1	7.5	-	-	-	-	-		<0.1	7.5	<0.1
59-50-7	4-Chloro, 3-methylphenol	O	H		µg/l	0.05	3	0	<0.05	<0.05	40	h	40	0	0		<0.05	<0.05	<0.05
106-47-8	4-Chloroaniline		H		µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
7005-72-3	4-Chlorophenyl phenyl ether				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
106-44-5	4-Methylphenol				µg/l	0.05	3	1	<0.05	7.46	-	-	-	-	-		<0.05	7.46	<0.05
100-01-6	4-Nitroaniline				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
62-53-3	Aniline				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
84-65-1	Anthraquinone		NP		µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
103-33-3	Azobenzene				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
85-68-7	Benzyl butyl phthalate	SP			µg/l	0.05	3	0	<0.05	<0.05	7.5	h	7.5	0	0		<0.05	<0.05	<0.05
111-91-1	Bis(2-chloroethoxy)methane				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
111-44-4	Bis(2-chloroethyl)ether		H		µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
39638-32-9	Bis(2-chloroisopropyl)ether				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
101-55-3	Bromophenyl phenyl ether				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
86-74-8	Carbazole				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
132-64-9	Dibenzofuran				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
84-74-2	Dibutyl phthalate	O	NP		µg/l	0.05	3	1	<0.05	0.36	8	h	8	0	0		<0.05	0.36	<0.05
84-66-2	Diethyl phthalate (DEP)	O			µg/l	0.05	3	0	<0.05	<0.05	200	h	200	0	0		<0.05	<0.05	<0.05
131-11-3	Dimethyl phthalate (DMP)	O			µg/l	0.05	3	0	<0.05	<0.05	800	h	800	0	0		<0.05	<0.05	<0.05
118-74-1	Hexachlorobenzene	PHS	H	9.6	µg/l	0.05	3	0	<0.05	<0.05	0.05	h	0.05	0	0		<0.05	<0.05	<0.05
67-72-1	Hexachloroethane		H	49900	µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
78-59-1	Isophorone				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
98-95-3	Nitrobenzene				µg/l	0.05	3	0	<0.05	<0.05	-	-	-	-	-		<0.05	<0.05	<0.05
108-95-2	Phenol	SP	NP	84100000	µg/l	0.05	3	0	<0.05	<0.05	7.7	h	7.7	0	0		<0.05	<0.05	<0.05

EQS Assessment Notes

Surface Water Representative Hardness as mg/l $CaCO_3$	10
PNEC calculated (inland EQS)	

Substance Designation

EQS Category

PS	**Priority substance**
PHS	**Priority hazardous substance**
O	Operational
OP	Other Pollutant
SP	Specific Pollutant

JAGDAG Hazardous Substances Determination (UK)

H	Hazardous substance
NP	Non-hazardous pollutant
(-)	Not included in assessment

Data Sources - DWS (England & Wales)

a	The Water Supply (Water Quality) Regulations 2016 (Statutory Instrument 2016 No. 614)
b	The Water Supply (Water Quality) Regulations 2018 (Statutory Instrument 2018 No. 647 (Wales 121))
c	As above - pesticides not individually specified
d	DRINKING WATER INSPECTORATE. January 2021. Guidance on the Water Supply (Water Quality) Regulations 2016 specific to PFOS (perfluorooctane sulphonate) and PFOA (perfluorooctanoic acid) concentrations in drinking water.
e	WORLD HEALTH ORGANIZATION. 2021. Guidelines for drinking-water quality (4th Edition incorporating the 1st and 2nd addendum). WHO, Geneva.

Data Sources - RPV (Scotland

f	Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs

Data Sources - EQS England and Wales

g	The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
h	GOV.UK. April 2018. Surface water pollution risk assessment for your environmental permit. https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit, accessed 18/04/2018.
i	Proposed Environmental Quality Standards for Ethylbenzene in Water, R&D Technical Report P2-115/TR4. EA 2001
j	The Water Supply (Water Quality) Regulations 1989

Data Sources - EQS Scotland

k	Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters

Data Sources - Minimum Reporting Values (MRV) & JAGDAG Determination

l	GOV.UK.January 2017. Hazardous substances to groundwater: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values, accessed 22/10/2018.
m	https://www.wfduk.org/tagged/hazardous-substances

Data Sources - SoBRA GWVap

n	Sobra, 2017. Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater.

Vapour Risk Assessment of Groundwater Data

Scenario	Human Health (Vapours)
Assessment Level	RTM Level 2 - Groundwater Beneath Source Assessment - groundwater samples
Data set:	Groundwater
Client:	Trivallis
Site:	Penrhys Village
Job no:	C1060.1
Lab. report no(s).:	24-032554 , 24-035718-1 and 24-040066-1

Hydrock now Stantec

Data Filters	
Zone	All Zones
Strata Filter	All Strata
Date Min	24/07/2024
Date Max	02/09/2024

Results Shading Key

123*	Exceeds solubility value
<1	Grey text and '<' sign if value <= LoD
59	Exceeds screening value
590	Exceeds 10 x screening value

	Determinand Designations			Sample Summaries						Water Quality Target (WQT) (Exceeded if Red Text)				No. Samples > WQT	No. Samples above LoD > WQT
CAS / AGS Number	Determinand	EQS Category	Hazardous Substance Status	Solubility Limit (µg/l)	Units	Limit of Detection (LoD)	No. of Samples	No. of Samples > LoD	Min	Max	SoBRA GWvap Residential		Screening Value (minimum of WQT)			
	Zone															
	Screened Strata															
	Date															
	Sampling Round															
	Location															
P5133	Hardness as mg/l $CaCO_3$				mgCaCO3/l	0	3	3	31.2	45.9	-		-			
P5134	pH (min.) (su)	O			pH Units		0				-		-			
P5134	pH (max.) (su)	O			pH Units	0	3	3	6.7	7.1	-		-			
P1287	Electrical conductivity (µS/cm)				µS/cm	0	3	3	200	390	-		-			
P1295	Cyanide (free) (hydrogen cyanide)	SP	NP		µg/l	1	3	0	<1	<1	-		-			
57-12-5	Cyanide (total)				µg/l	1	3	0	<1	<1	-		-			
P1839	Dissolved Organic Carbon (DOC) (mg/l)				mg/l	0.1	3	3	1.59	21.1	-		-			
P5140	Ammonium (NH_4^+)		NP		µg/l	15	3	3	21	72	-		-			
P1238	Ammnoniacal Nitrogen (as N)		NP		µg/l	15	3	3	16	56	-		-			
P1720	Ammonia (unionised) (NH_3 as N) (free ammonia)	SP	NP		µg/l	15	3	3	20	68	-		-			
15541-45-4	Bromate (BrO_3)				mg/l	0.002	3	0	<0.002	<0.002	-		-			
16887-00-6	Chloride (Cl^-)	O			mg/l	0.15	3	3	4.8	7.4	-		-			
16984-48-8	Fluoride (F^-)	O			µg/l	50	3	3	54	100	-		-			
P1348	Nitrate (NO_3^-)				mg/l	0.05	3	2	<0.05	0.36	-		-			
P1349	Nitrite (NO_2^-)				µg/l	5	3	0	<5	<5	-		-			
14808-79-8	Sulfate (SO_4^{2-})	O			mg/l	0.045	3	3	16.1	44.8	-		-			
7429-90-5	Aluminium (Al) (dissolved)				µg/l	1	3	3	4.2	29	-		-			
7440-36-0	Antimony (Sb) (dissolved)		NP		µg/l	0.4	3	2	<0.4	1.2	-		-			
7440-38-2	Arsenic (As) (dissolved)	SP	H		µg/l	0.15	3	3	1.53	10.5	-		-			
7440-39-3	Barium (Ba) (dissolved)				µg/l	0.06	3	3	8.4	13	-		-			
7440-42-8	Boron (B) (dissolved)	O	NP		µg/l	10	3	3	12	24	-		-			
7440-43-9	Cadmium (Cd) (dissolved)	PHS	NP		µg/l	0.02	3	0	<0.02	<0.02	-		-			
7440-70-2	Calcium (Ca) (dissolved)				mg/l	0.012	3	3	7.8	11	-		-			
16065-83-1	Chromium (Cr III) (dissolved)	SP			µg/l	5	3	0	<5	<5	-		-			
18540-29-9	Chromium (Cr VI) (dissolved)	SP	H		µg/l	5	3	0	<5	<5	-		-			
7440-47-3	Chromium (Cr) (dissolved)				µg/l	0.2	3	1	<0.2	0.3	-		-			
7440-48-4	Cobalt (Co) (dissolved)	O	NP		µg/l	0.2	3	3	2.3	5.6	-		-			
7440-50-8	Copper (Cu) (dissolved)	SP	NP		µg/l	0.5	3	0	0.2	<0.5	-		-			
7439-89-6	Iron (Fe) (dissolved)	SP			mg/l	0.004	3	3	0.056	2.7	-		-			
7439-92-1	Lead (Pb) (dissolved)	PS	H		µg/l	0.2	3	0	<0.2	<0.2	-		-			
7439-95-4	Magnesium (Mg) (dissolved)						0				-		-			
P1286	Manganese (Mn) (dissolved)	SP			µg/l	0.05	3	3	1400	4400	-		-			
7439-97-6	Mercury (Hg) (dissolved)	PHS	H	56	µg/l	0.05	3	1	<0.05	0.08	1.1	n	1.1	0	0	
7440-02-0	Nickel (Ni) (dissolved)	PS	NP		µg/l	0.5	3	3	7.6	10	-		-			
7782-49-2	Selenium (Se) (dissolved)		NP		µg/l	0.6	3	0	<0.6	<0.6	-		-			
7440-22-4	Silver (Ag) (dissolved)	O			µg/l	0.05	3	1	<0.05	0.82	-		-			
7440-23-5	Sodium (Na) (dissolved)				mg/l	0.01	3	3	40	73	-		-			
7440-31-5	Tin (Sn) (dissolved)	O			µg/l	0.2	3	1	<0.2	0.72	-		-			
7440-62-2	Vanadium (V) (dissolved)	O			µg/l	0.2	3	1	<0.2	0.3	-		-			
7440-66-6	Zinc (Zn) (dissolved)	SP	NP		µg/l	0.5	3	3	0.6	7.6	-		-			
83-32-9	Acenaphthene		H	4110	µg/l	0.01	3	0	<0.01	<0.01	170000	n	170000	0	0	
208-96-8	Acenaphthylene			7950	µg/l	0.01	3	0	<0.01	<0.01	220000	n	220000	0	0	
120-12-7	Anthracene	PHS	H	56	µg/l	0.01	3	0	<0.01	<0.01	-		-			
56-55-3	Benzo(a)anthracene			3.8	µg/l	0.01	3	0	<0.01	<0.01	-		-			
50-32-8	Benzo(a)pyrene	PHS	H	3.8	µg/l	0.01	3	0	<0.01	<0.01	-		-			
205-99-2	Benzo(b)fluoranthene	PHS	H	2	µg/l	0.01	3	0	<0.01	<0.01	-		-			
191-24-2	Benzo(ghi)perylene	PHS	H	0.26	µg/l	0.01	3	0	<0.01	<0.01	-		-			
207-08-9	Benzo(k)fluoranthene	PHS	H	0.8	µg/l	0.01	3	0	<0.01	<0.01	-		-			
218-01-9	Chrysene			2	µg/l	0.01	3	0	<0.01	<0.01	-		-			
53-70-3	Dibenz(a,h)anthracene			0.6	µg/l	0.01	3	0	<0.01	<0.01	-		-			
206-44-0	Fluoranthene	PS	H	230	µg/l	0.01	3	1	<0.01	0.16	-		-			
86-73-7	Fluorene			1860	µg/l	0.01	3	2	<0.01	0.23	210000	n	210000	0	0	
193-39-5	Indeno(1,2,3-cd)pyrene	PHS	H	0.2	µg/l	0.01	3	0	<0.01	<0.01	-		-			
91-20-3	Naphthalene	PS	NP	19000	µg/l	0.01	3	1	<0.01	0.34	220	n	220	0	0	
85-01-8	Phenanthrene			1120	µg/l	0.01	3	2	<0.01	0.68	-		-			
129-00-0	Pyrene			130	µg/l	0.01	3	1	<0.01	0.09	-		-			
GRP01	PAHs - sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene	PHS	H		µg/l	0.04	3	0	<0.04	<0.04	-		-			
P1877	Total Phenols	SP	NP	84100000	µg/l	1	3	2	<1	3.6	-		-			
P1407	Aliphatic >EC5-EC6			31000	µg/l	1	3	0	<1	<1	1900	n	1900	0	0	
P1408	Aliphatic >EC6-EC8			5370	µg/l	1	3	0	<1	<1	1500	n	1500	0	0	
P1409	Aliphatic >EC8-EC10			427	µg/l	1	3	0	<1	<1	57	n	57	0	0	
P1410	Aliphatic >EC10-EC12			33.9	µg/l	10	3	0	<10	<10	37	n	37	0	0	
P1411	Aliphatic >EC12-EC16			0.759	µg/l	10	3	0	<10	<10	-		-			
P1412	Aliphatic >EC16-EC21				µg/l	10	3	0	<10	<10	-		-			
P1413	Aliphatic >EC21-EC35				µg/l	10	3	1	<10	190	-		-			
P1938	Aliphatic >EC16-EC35			0.00254	µg/l	10	3	1	<10	190	-		-			
P1415	Aliphatic >EC35-EC44			0.00254	µg/l	10	3	0	<10	<10	-		-			
P1418	Aliphatic >EC5-EC35				µg/l	10	3	1	<10	190	-		-			
P1420	Aliphatic >EC5-EC44				µg/l	10	3	1	<10	190	-		-			
P1641	Aromatic EC5-EC7			1780000	µg/l	1	3	0	<1	<1	210000	n	210000	0	0	
P1355	Aromatic >EC7-EC8			590000	µg/l	1	3	0	<1	<1	220000	n	220000	0	0	
P1356	Aromatic >EC8-EC10			64600	µg/l	1	3	0	<1	<1	1900	n	1900	0	0	
P1357	Aromatic >EC10-EC12			24500	µg/l	10	3	1	<10	16	6800	n	6800	0	0	
P1358	Aromatic > EC12-EC16			5750	µg/l	10	3	2	<10	40	39000	n	39000	0	0	
P1359	Aromatic >EC16-EC21			653	µg/l	10	3	2	<10	50	-		-			
P1360	Aromatic >EC21-EC35			6.61	µg/l	10	3	1	<10	20	-		-			
P1362	Aromatic >EC35-EC44			6.61	µg/l	10	3	0	<10	<10	-		-			
P1365	Aromatic >EC5-EC35				µg/l	10	3	2	<10	130	-		-			
P1941	Aromatic >EC5-EC44				µg/l	10	3	2	<10	130	-		-			
P1373	TPH EC5-44				µg/l	10	3	2	<10	240	-		-			
71-43-2	Benzene	PS	H	1780000	µg/l	3	3	0	<3	<3	210	n	210	0	0	
108-88-3	Toluene	SP	H	590000	µg/l	3	3	0	<3	<3	230000	n	230000	0	0	
100-41-4	Ethylbenzene		H	180000	µg/l	3	3	0	<3	<3	10000	n	10000	0	0	
P1374	m,p-Xylene	O	H	200000	µg/l	3	3	0	<3	<3	-		-			
95-47-6	o-Xylene	O	H	173000	µg/l	3	3	0	<3	<3	12000	n	12000	0	0	
1634-04-4	Methyl tertiary butyl ether (MTBE)		NP	48000000	µg/l	3	3	0	<3	<3	83000	n	83000	0	0	
P1092	m,p,o-Xylene (sum)	O	H		µg/l	3	3	0	<3	<3	-		-			
630-20-6	1,1,1,2-Tetrachloroethane		H	1110000	µg/l	3	3	0	<3	<3	240	n	240	0	0	
71-55-6	1,1,1-Trichloroethane	O	NP	1300000	µg/l	3	3	0	<3	<3	3000	n	3000	0	0	
79-34-5	1,1,2,2-Tetrachloroethane		H	2930000	µg/l	3	3	0	<3	<3	1600	n	1600	0	0	
76-13-1	1,1,2-Trichloro 1,2,2-Trifluoroethane		H		µg/l	3	3	0	<3	<3	-		-			
79-00-5	1,1,2-Trichloroethane	O	NP	4490000	µg/l	3	3	0	<3	<3	520	n	520	0	0	
75-34-3	1,1-Dichloroethane		NP	3666000	µg/l	3	3	0	<3	<3	2700	n	2700	0	0	
75-35-4	1,1-Dichloroethene		NP	3100000	µg/l	3	3	0	<3	<3	160	n	160	0	0	
563-58-6	1,1-Dichloropropene				µg/l	3	3	0	<3	<3	-		-			
87-61-6	1,2,3-Trichlorobenzene			21000	µg/l	3	3	0	<3	<3	35	n	35	0	0	
120-82-1	1,2,4-Trichlorobenzene		H	41400	µg/l	3	3	0	<3	<3	68	n	68	0	0	
95-63-6	1,2,4-Trimethylbenzene		H	559000	µg/l	3	3	0	<3	<3	24	n	24	0	0	
96-12-8	1,2-Dibromo-3-chloropropane			1230000	µg/l	3	3	0	<3	<3	-		-			
106-93-4	1,2-Dibromoethane		H	4300000	µg/l	3	3	0	<3	<3	-		-			
95-50-1	1,2-Dichlorobenzene		H	133000	µg/l	3	3	0	<3	<3	2000	n	2000	0	0	
107-06-2	1,2-Dichloroethane (EDC)	PS	NP	8680000	µg/l	3	3	0	<3	<3	8.9	n	8.9	0	0	
78-87-5	1,2-Dichloropropane		H	2050000	µg/l	3	3	0	<3	<3	22	n	22	0	0	
108-67-8	1,3,5-Trimethylbenzene				µg/l	3	3	0	<3	<3	-		-			
541-73-1	1,3-Dichlorobenzene		H	103000	µg/l	3	3	0	<3	<3	31	n	31	0	0	
142-28-9	1,3-Dichloropropane		H		µg/l	3	3	0	<3	<3	-		-			
106-46-7	1,4-Dichlorobenzene		H	51200	µg/l	3	3	0	<3	<3	5000	n	5000	0	0	
594-20-7	2,2-Dichloropropane				µg/l	3	3	0	<3	<3	-		-			
95-49-8	2-Chlorotoluene		H		µg/l	3	3	0	<3	<3	-		-			
106-43-4	4-Chlorotoluene		H		µg/l	3	3	0	<3	<3	-		-			
108-86-1	Bromobenzene			388040	µg/l	3	3	0	<3	<3	220	n	220	0	0	
75-27-4	Bromodichloromethane			30000000	µg/l	3	3	0	<3	<3	17	n	17	0	0	
74-83-9	Bromomethane				µg/l	3	3	0	<3	<3	-		-			
104-51-8	Butylbenzene				µg/l	3	3	0	<3	<3	-		-			
108-90-7	Chlorobenzene		H	387000	µg/l	3	3	0	<3	<3	98	n	98	0	0	
75-00-3	Chloroethane			5742000	µg/l	3	3	0	<3	<3	10000	n	10000	0	0	
74-87-3	Chloromethane			5350000	µg/l	3	3	0	<3	<3	14	n	14	0	0	
156-59-2	cis 1,2-Dichloroethene (cis 1,2 DCE)		NP	7550000	µg/l	3	3	0	<3	<3	130	n	130	0	0	
10061-01-5	cis 1,3-Dichloropropene		H	2700000	µg/l	3	3	0	<3	<3	-		-			
124-48-1	Dibromochloromethane			1050000	µg/l	3	3	0	<3	<3	-		-			
74-95-3	Dibromomethane				µg/l	3	3	0	0	0	-		-			
87-68-3	Hexachlorobutadiene (HCBD)	PHS	H	4800	µg/l	3	3	0	<3	<3	1.7	n	1.7	3	0	
98-82-8	Isopropylbenzene			56000	µg/l	3	3	0	<3	<3	850	n	850	0	0	
103-65-1	n-Propylbenzene			54100	µg/l	3	3	0	<3	<3	2700	n	2700	0	0	
99-87-6	p-Isopropyltoluene				µg/l	3	3	0	<3	<3	-		-			
135-98-8	sec-Butylbenzene				µg/l	3	3	0	<3	<3	-		-			
100-42-5	Styrene	O	H	290000	µg/l	3	3	0	<3	<3	8800	n	8800	0	0	
98-06-6	tert-Butylbenzene				µg/l	3	3	0	<3	<3	-		-			
127-18-4	Tetrachloroethene (PCE)	OP	NP	225000	µg/l	3	3	0	<3	<3	34	n	34	0	0	
56-23-5	Tetrachloromethane (Carbon Tetrachloride)	OP	H	840000	µg/l	3	3	0	<3	<3	5.3	n	5.3	0	0	
156-60-5	trans 1,2-Dichloroethene (trans 1,2 DCE)		NP	5250000	µg/l	3	3	0	<3	<3	160	n	160	0	0	
10061-02-6	trans 1,3-Dichloropropene		H	2800000	µg/l	3	3	0	<3	<3	-		-			
75-25-2	Tribromomethane (Bromoform)			3000000	µg/l	3	3	0	<3	<3	3100	n	3100	0	0	
79-01-6	Trichloroethene (TCE)	OP	H	1370000	µg/l	3	3	0	<3	<3	5.7	n	5.7	0	0	
75-69-4	Trichlorofluoromethane (CFC-11)				µg/l	3	3	0	<3	<3	-		-			
67-66-3	Trichloromethane (chloroform)	PS	H	8950000	µg/l	3	3	0	<3	<3	730	n	730	0	0	
75-01-4	Vinyl chloride (chloroethene) (VC)		H	2760000	µg/l	3	3	0	<3	<3	0.62	n	0.62	3	0	
95-95-4	2,4,5-Trichlorophenol		H		µg/l	0.05	3	0	<0.05	<0.05	-		-			
88-06-2	2,4,6-Trichlorophenol		H	4340001	µg/l	0.05	3	0	<0.05	<0.05	-		-			
120-83-2	2,4-Dichlorophenol	SP	H	4500000	µg/l	0.05	3	0	<0.05	<0.05	-		-			
105-67-9	2,4-Dimethylphenol				µg/l	0.05	3	0	<0.05	<0.05	-		-			
121-14-2	2,4-Dinitrotoluene				µg/l	0.05	3	0	<0.05	<0.05	-		-			
606-20-2	2,6-Dinitrotoluene				µg/l	0.05	3	0	<0.05	<0.05	-		-			
91-58-7	2-Chloronaphthalene			11700	µg/l	0.05	3	0	<0.05	<0.05	160	n	160	0	0	
95-57-8	2-Chlorophenol	O	H	22700000	µg/l	0.05	3	0	<0.05	<0.05	-		-			
91-57-6	2-Methylnaphthalene				µg/l	0.05	3	2	<0.05	0.87	-		-			
95-48-7	2-Methylphenol		NP		µg/l	0.05	3	0	<0.05	<0.05	-		-			
88-75-5	2-Nitrophenol				µg/l	0.05	3	0	<0.05	<0.05	-		-			
P1846	3&4 Methylphenol				µg/l	0.1	3	1	<0.1	7.5	-		-			
59-50-7	4-Chloro, 3-methylphenol	O	H		µg/l	0.05	3	0	<0.05	<0.05	-		-			
106-47-8	4-Chloroaniline		H		µg/l	0.05	3	0	<0.05	<0.05	-		-			
7005-72-3	4-Chlorophenyl phenyl ether				µg/l	0.05	3	0	<0.05	<0.05	-		-			
106-44-5	4-Methylphenol				µg/l	0.05	3	1	<0.05	7.46	-		-			
100-01-6	4-Nitroaniline				µg/l	0.05	3	0	<0.05	<0.05	-		-			
62-53-3	Aniline				µg/l	0.05	3	0	<0.05	<0.05	-		-			
84-65-1	Anthraquinone		NP		µg/l	0.05	3	0	<0.05	<0.05	-		-			
103-33-3	Azobenzene				µg/l	0.05	3	0	<0.05	<0.05	-		-			
85-68-7	Benzyl butyl phthalate	SP			µg/l	0.05	3	0	<0.05	<0.05	-		-			
111-91-1	Bis(2-chloroethoxy)methane				µg/l	0.05	3	0	<0.05	<0.05	-		-			
111-44-4	Bis(2-chloroethyl)ether		H		µg/l	0.05	3	0	<0.05	<0.05	-		-			
39638-32-9	Bis(2-chloroisopropyl)ether				µg/l	0.05	3	0	<0.05	<0.05	-		-			
101-55-3	Bromophenyl phenyl ether				µg/l	0.05	3	0	<0.05	<0.05	-		-			
86-74-8	Carbazole				µg/l	0.05	3	0	<0.05	<0.05	-		-			
132-64-9	Dibenzofuran				µg/l	0.05	3	0	<0.05	<0.05	-		-			
84-74-2	Dibutyl phthalate	O	NP		µg/l	0.05	3	1	<0.05	0.36	-		-			
84-66-2	Diethyl phthalate (DEP)	O			µg/l	0.05	3	0	<0.05	<0.05	-		-			
131-11-3	Dimethyl phthalate (DMP)	O			µg/l	0.05	3	0	<0.05	<0.05	-		-			
118-74-1	Hexachlorobenzene	PHS	H	9.6	µg/l	0.05	3	0	<0.05	<0.05	16	n	16	0	0	
67-72-1	Hexachloroethane		H	49900	µg/l	0.05	3	0	<0.05	<0.05	8.5	n	8.5	0	0	
78-59-1	Isophorone				µg/l	0.05	3	0	<0.05	<0.05	-		-			
98-95-3	Nitrobenzene				µg/l	0.05	3	0	<0.05	<0.05	-		-			
108-95-2	Phenol	SP	NP	84100000	µg/l	0.05	3	0	<0.05	<0.05	-		-			

EQS Assessment Notes	
Surface Water Representative Hardness as mg/l $CaCO_3$	10
PNEC calculated (Inland EQS)	

Substance Designation	
EQS Category	
PS	**Priority substance**
PHS	**Priority hazardous substance**
O	Operational
OP	Other Pollutant
SP	Specific Pollutant
JAGDAG Hazardous Substances Determination (UK)	
H	Hazardous substance
NP	Non-hazardous pollutant
U	Not included in assessment

Data Sources - DWS (England & Wales)	
a	The Water Supply (Water Quality) Regulations 2016 (Statutory Instrument 2016 No. 614)
b	The Water Supply (Water Quality) Regulations 2018 (Statutory Instrument 2018 No. 647 (Wales 128))
c	As above - pesticides not individually specified
d	DRINKING WATER INSPECTORATE. January 2021. Guidance on the Water Supply (Water Quality) Regulations 2016 specific to PFOS (perfluorooctane sulphonate) and PFOA (perfluorooctanoic acid) concentrations in drinking water.
e	WORLD HEALTH ORGANIZATION. 2021. Guidelines for drinking-water quality (4th Edition incorporating the 1st and 2nd addendum). WHO, Geneva.
Data Sources - RPV (Scotland	
f	Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs
Data Sources - EQS England and Wales	
g	The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
h	GOV.UK. April 2018. Surface water pollution risk assessment for your environmental permit. https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit, accessed 18/04/2018.
i	Proposed Environmental Quality Standards for Ethylbenzene in Water. R&D Technical Report P2-115/TR4, EA 2001
j	The Water Supply (Water Quality) Regulations 1989
Data Sources - EQS Scotland	
k	Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters
Data Sources - Minimum Reporting Values (MRV) & JAGDAG Determination	
l	GOV.UK. January 2017. Hazardous substances to groundwater. https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values, accessed 22/10/2018.
m	https://www.wfduk.org/tagged/hazardous-substances
Data Sources - SoBRA GWVap	
n	Sobra, 2017. Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater.

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

Exploratory hole location plan

OS NORTH

BH302
TP_P1a_104
TP_P1a_113
TP_P1a_104
TP_P1a_103
BH_P1a_203
TP101
TP202
TP_P1a_105
TP_P1a_102
TP_P1a_106
BH301
TP104
TP_P1a_112
TP_P1a_101
TP_P1a_109
TP201
TP_P1a_108
BH_P1a_202
TP_P1a_107
TP_P1a_111
TP207
BH305
BH_P1a_201
TP209
TP_P1a_110
TP208

KEY

Hydrock 2025 Ground Investigation

- Phase 1a Redline Boundary
- Dynamic Sampler with Rotary Cored follow-on borehole
- Trial Pit
- Trial Pit with Infiltration Test

GEL 2024 Ground Investigation

- Dynamic Sampler with Rotary Cored follow-on borehole
- Trial Pit (targetting district heat network)
- Trial Pit (general coverage)
- Trial Pit with Infiltration Test

NOTES

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.

2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

3. This drawing has been based on the following drawings and information:
Zenith Land Surveys Ltd Topographical Survey Drawing 21948_A dated 05/03/2024.

4. Information from BH302 and TP208 have been utilised within the Phase 1a Ground Investigation Report due to proximity to the redline boundary for the Phase 1a area, however as shown are not within the area itself.

REV.	FIRST ISSUE / REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P1	FIRST ISSUE	EF	10/03/25	AE	10/03/25	AE	11/03/25

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CLIENT
TRIVALLIS

PROJECT
PENRHYS VILLAGE PHASE 1A

TITLE
EXPLORATORY HOLE LOCATION PLAN - ALL PREVIOUS INVESTIGATION LOCATIONS

HYDROCK PROJECT NO.	SCALE @ A3
C-30603	1:1000

PURPOSE OF ISSUE	STATUS
SUITABLE FOR INFORMATION	S2

DRAWING NO.	REVISION
30603-HYD-XX-XX-DR-GE-1021	P1

Exploratory hole logs

Hydrock now Stantec	Project: Penrhys Phase 1a	Borehole No BH _Ph1a_201 Page No. 1 of 2
Method: Dynamic Sampled & Rotary Cored	Date(s): 27/02/2025	
Client: Trivallis	Co-ords: 300025.23, 194929.05	Checked By: / Flush:
Hydrock Project No: 30603	Ground Level: 324.20m OD	Scale: 1:30

Sample/Core Run (m)	Samples / Tests: Depth (m)	Type	Results	Mechanical Log: TCR	SCR	RQD	If: Min Mean Max	Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
									CONCRETE.	0.16	(0.16)	324.04		
									MADE GROUND: Greyish brown sandy silty fine to coarse GRAVEL of angular to subangular flint with frequent gravel sized fragments of concrete and igneous rock with occasional cobble sized fragments of concrete.	0.40	(0.24)	323.80		
									MADE GROUND: Dark greyish brown gravelly slightly sandy organic CLAY with low cobble content. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded sandstone. With occasional gravel sized fragments of concrete and a slight organic odour (decomposing vegetation).	1	(0.90)			
	1.20	SPT	N=8 (1,1,2,2,1,3)							1.30		322.90		
									Firm to stiff orangish brown very gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	2.00	(0.70)	322.20		
2.00 - 3.50	2.00	SPT	50/110mm (19,6,34,16)				NI 10 20		Partially weathered heavily fractured with occasional orangish brown discolouration thinly to medium bedded grey and brown mottled medium to coarse grained SANDSTONE. Fractures are vertical to 70˚ closed smooth planar (RHONDDA MEMBER SANDSTONE)	2				
				87	51	0	10 30 80		*... Recovered as a cobbly gravel of fine to coarse subangular gravel of sandstone between 2.50m and 3.00m.*					
									... With a thin horizon of coal (c. 10mm thick) at 3.20m depth.	3				
3.50 - 5.00	3.50	SPT	50/35mm (25,50)				NI 20 130		*... With common thick laminae of blueish black coal/ organic matter between 3.50m and 5.00m.*					
				100	70	13			*... Recovered as gravel of fine subrounded sandstone between 4.40m and 4.50m depth.*	4				
									... With much orangish brown discolouration between 4.60m and 4.80m depth.					
5.00 - 6.50	5.00	SPT	50/20mm (25,50)				NI 40 90		*... With large infilled subvertical fracture c. 10mm thick between 5.00m and 8.00m. Infill comprises orangish brown and grey mottled slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to subrounded sandstone.*	5	(6.00)			
				87	57	23	10 80 190							
										6				

Continued on Next Sheet

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry and stable. Borehole backfilled to 1.00m with bentonite. Standpipe installed to 1.00m depth, top 0.50m plain with bentonite seal and remainder slotted with gravel surround. Complete with gas tap, bung and flush security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec	Project: Penrhys Phase 1a	Borehole No BH _Ph1a_201 Page No. 2 of 2
Method: Dynamic Sampled & Rotary Cored	Date(s): 27/02/2025	
Client: Trivallis	Co-ords: 300025.23, 194929.05	Checked By: Flush:
Hydrock Project No: 30603	Ground Level: 324.20m OD	Scale: 1:30

Sample/Core Run (m)	Samples / Tests			Mechanical Log				Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrum-entation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	If: Min Mean Max							
									Partially weathered heavily fractured with occasional orangish brown discolouration thinly to medium bedded grey and brown mottled medium to coarse grained SANDSTONE. Fractures are vertical to 70˚ closed smooth planar (RHONDDA MEMBER SANDSTONE)					
							NI 50 80							
6.50 - 8.00	6.60	SPT	50/15mm (25,50)				5 40 130							
				75	58	23								
	8.00	SPT	52/155mm (4,5,8,34,10)						End of Borehole at 8.00m	8.00		316.20		

Progress and Observations								
Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling		
From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry and stable. Borehole backfilled to 1.00m with bentonite. Standpipe installed to 1.00m depth, top 0.50m plain with bentonite seal and remainder slotted with gravel surround. Complete with gas tap, bung and flush security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec	Project: Penrhys Phase 1a	Borehole No BH_Ph1a_202 Page No. 1 of 2
Method: Dynamic Sampled & Rotary Cored	Date(s): 21/02/2025 - 26/02/2025	Logged By: Emily Frankish / Drilled By: CJ Associates
Client: Trivallis	Co-ords: 300089.01, 194982.30	Checked By: / Flush:
Hydrock Project No: 30603	Ground Level: 324.94m OD	Scale: 1:30

Sample/Core Run (m)	Samples / Tests: Depth (m)	Type	Results	Mechanical Log: TCR	SCR	RQD	If: Min Mean Max	Water Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
									CONCRETE.	0.10	(0.10)	324.83		
	0.70 - 0.90	ES							MADE GROUND: Firm orangish brown and grey mottled slightly sandy gravelly silty CLAY. Sand is medium to coarse. Gravel is fine to coarse subangular to subrounded sandstone. (Possible Reworked Natural).	1.30	(1.20)	323.64		
	1.20	SPT	N=18 (1,2,4,4,4,6)						MADE GROUND: Firm dark brownish grey slightly sandy gravelly silty CLAY with occasional pockets of organic matter (decomposing). Sand is medium to coarse. Gravel is fine to coarse subangular to subrounded sandstone. (Possibly Reworked Natural).	2.30	(1.00)	322.64		
	2.00	SPT	N=33 (3,4,4,5,14,10)						Firm to stiff orangish brown very gravelly sandy CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	3.00	(0.70)	321.94		
	3.00	SPT	N=32 (5,3,7,5,8,12)						Completely weathered grey SANDSTONE. Recovered as a medium dense orangish brown and grey mottled fine to coarse GRAVEL of subangular to subrounded sandstone with low cobble content of subangular sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	4.00	(1.00)	320.94		
3.80 - 5.00	3.80	SPT	50/45mm (11,14,50)	92	54	11	60 60 80 / 30 40 130		*... With sandy horizon at 3.40m to 3.70m. Sand is medium to coarse.* *... With single vertical fracture between 3.50m and 3.80m* *... With two vertical fractures perpendicular to to each other between 3.80m and 4.80m.* Heavily fractured thinly bedded orangish brown and grey mottled medium to coarse grained SANDSTONE. Fractures are subvertical to 80˚ closed smooth planar. (RHONDDA MEMBER SANDSTONE).,					
5.00 - 6.50	5.00	SPT	50/15mm (25,50)	40	13	0	25 50 80		*... Heavily fractured between 4.80m and 4.90m. Recovered as a medium to coarse angular gravel of sandstone.* *... Poor recovery due to heavily fractured rock. Recovered as cobbly gravel of fine to coarse subangulwr to angular sandstone.* *... Poor recovery between 5.00m and 7.00m due to collapse from heavily fractured sandstone below 3.90m.*	6.80	(2.80)	318.14		

Continued on Next Sheet

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry. Borehole unstable within heavily fractured rock below 3.00m and collapsing below 6.00m. Borehole backfilled to 2.00m depth with bentonite. Standpipe installed to 2.00m, top 1.00m plain with bentonite seal, and remainder slotted with gravel surround. Completed with a gas tap, bung and flush security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a

Borehole No
BH_Ph1a_202

Method: Dynamic Sampled & Rotary Cored	Date(s): 21/02/2025 - 26/02/2025	Logged By: Emily Frankish	Drilled By: CJ Associates
Client: Trivallis	Co-ords: 300089.01, 194982.30	Checked By:	Flush:
Hydrock Project No: 30603	Ground Level: 324.94m OD		Scale: 1:30

Sample/Core Run (m)	Samples / Tests			Mechanical Log				Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	If: Min Mean Max							
6.50 - 7.00	6.50	SPT	50/10mm (25,50)						Heavily fractured thinly bedded orangish brown and grey mottled medium to coarse grained SANDSTONE. Fractures are subvertical to 80° closed smooth planar. (RHONDDA MEMBER SANDSTONE)., *... Poor recovery due to heavily fracturing. Recovered as a gravel of fine to medium angular sandstone.*	6.80		318.14		
	7.00	SPT	50/35mm (5,20,50)						Very thinly to thinly bedded grey black and orangish brown mottled coarse grained SANDSTONE with occasional gravel of subrounded to rounded wood and petrified wood and with occasional voids c. 50mm diameter. (RHONDDA MEMBER SANDSTONE). End of Borehole at 7.00m	7.00	(0.20)	317.94		

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry. Borehole unstable within heavily fractured rock below 3.00m and collapsing below 6.00m. Borehole backfilled to 2.00m depth with bentonite. Standpipe installed to 2.00m, top 1.00m plain with bentonite seal, and remainder slotted with gravel surround. Completed with a gas tap, bung and flush security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a

Borehole No
BH_Ph1a_203
Page No. 1 of 2

Method: Dynamic Sampled & Rotary Cored	Date(s): 19/02/2025 - 24/02/2025		
Client: Trivallis	Co-ords: 300251.46, 195076.76	Checked By:	Flush:
Hydrock Project No: 30603	Ground Level: 340.65m OD		Scale: 1:30

Sample/Core Run (m)	Samples / Tests			Mechanical Log				Water Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	If: Min Mean Max							
	0.80 - 1.00	ES							Firm orangish brown sandy slightly gravelly TOPSOIL Sand is fine to medium. Gravel is fine to medium subangular sandstone with occasional gravel sized fragments of concrete and brick.	0.20	(0.20)	340.45		
	1.20	SPT	N=15 (1,3,2,4,3,6)						MADE GROUND: Dark brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded sandstone with abundant gravel sized fragments of brick, concrete, occasional timber and glass.	1	(1.30)			
	1.20 - 1.50	B								1.50		339.15		
	1.50 - 1.80	B							Completely weathered brown SANDSTONE. Recovered as a dark reddish brown slightly sandy silty fine to coarse GRAVEL of subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	1.80	(0.30)	338.85		
1.80 - 3.00	1.80	SPT	50/75mm (25,45)						Slightly weathered moderately weak very thinly to thinly bedded occasionally fractured orangish brown and grey mottled medium to coarse grained SANDSTONE. Fractures are subvertical smooth planar and occasionally stained orangish brown.	2				
				64	50	0	20 20 80							
3.00 - 4.50	3.00	SPT	50/85mm (7,10,28,22)						*... No recovery between 3.00m and 3.50m*	3				
				67	59	0	10 40 90							
	4.00	SPT	50/15mm (25,50)							4	(4.50)			
4.50 - 6.00														
				87	70	24	10 20 40			5				
							5 100 160							
6.00 - 7.50										6				

Continued on Next Sheet

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry and stable. Standpipe installed to 8.00m depth, top 5.00m plain with bentonite seal and remainder slotted with gravel surround. Completed with gas tap, bung and upright security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec	Project: Penrhys Phase 1a	Borehole No BH_Ph1a_203 Page No. 2 of 2	
Method: Dynamic Sampled & Rotary Cored	Date(s): 19/02/2025 - 24/02/2025		
Client: Trivallis	Co-ords: 300251.46, 195076.76	Checked By:	Flush:
Hydrock Project No: 30603	Ground Level: 340.65m OD		Scale: 1:30

Sample/Core Run (m)	Samples / Tests			Mechanical Log				Water Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend	Instrumentation / Backfill
	Depth (m)	Type	Results	TCR	SCR	RQD	If: Min Mean Max							
	6.00	SPT	50/15mm (25,50)				40 50 120		Slightly weathered moderately weak very thinly to thinly bedded occasionally fractured orangish brown and grey mottled medium to coarse grained SANDSTONE. Fractures are subvertical smooth planar and occasionally stained orangish brown. *... With a single vertical closed smooth planar fracture between 6.00m and 6.30m.*	6.30		334.35		
				100	76	37			Moderately weak to medium strong very thinly to thinly bedded grey black and orangish brown mottled coarse grained SANDSTONE with clasts of medium to coarse subrounded to rounded wood and petrified wood. *... With a very thin (<5mm thick) seam of coal at 6.50m.* *... With a single 45° open unfilled smooth planar fracture between 6.60m and 6.70m depth.* *... With a very thin seam (<5mm thick) of coal at 6.80m.* *... WIth much orangish brown discolouration and frequent thin to thick laminae of dark black coal between 7.00m and 7.10m.*	7.10	(0.80)	333.55		
7.50 - 8.00	7.50	SPT	50/20mm (25,50)				70 100 180							
				90	88	28	30 30 130		Moderately weak thinly bedded fractured orangish brown grey and brown multicoloured coarse grained SANDSTONE with occasional bands of fine grained silty sandstone throughout. Fractures are vertical to subvertical infilled (<5mm) smooth planar. Infill is dark grey very sandy clay. Sand is fine to coarse. *... With a closed smooth planar vertical fracture between 7.50m and 8.00m.*	8.00	(0.90)	332.65		
	8.00	SPT	50/10mm (25,50)						End of Borehole at 8.00m					

Progress and Observations

Rig	Date	Time	Borehole Depth (m)	Casing Depth (m)	Casing Diam.(mm)	Water Depth (m)	Flush Type	Returns (colour)

Chiselling

From (m)	To (m)	Duration (HH:MM)

General Remarks:
Borehole remained dry and stable. Standpipe installed to 8.00m depth, top 5.00m plain with bentonite seal and remainder slotted with gravel surround. Completed with gas tap, bung and upright security cover.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_101 Page No. 1 of 1
Method: Trial Pit	Date(s): 19/02/2025
Client: Trivallis	Co-ords: 300006.67, 195006.10
Hydrock Project No: 30603	Ground Level: 335.12m OD

Dimensions: m x m | Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20 - 0.30	ES			Firm orangish brown slightly sandy slightly gravelly TOPSOIL. Sand is fine. Gravel is fine to coarse angular to subangular sandstone with occasional gravel sized fragments of brick and concrete.	0.30	(0.30)	334.82	
				MADE GROUND: Loose grey gravelly slightly clayey fine to coarse SAND. Gravel is fine to medium angular to subangular sandstone with abundant gravel sized fragments of brick, concrete, timber, wire, glass, plastic, rebar, blacktop, scrap metal and plastic bags.	0.60	(0.30)	334.52	
				MADE GROUND: Loose dark brown very sandy clayey GRAVEL of fine to medium sandstone with abundant gravel and cobble sized fragments of brick, concrete and timber.	2.10	(1.50)	333.02	
2.10 - 2.50	B			MADE GROUND: Very soft orangish brown and grey sandy gravelly silty CLAY. Sand is fine. Gravel is fine to medium subangular to subrounded sandstone with frequent gravel sized fragments of concrete and brick.				
2.50 - 2.60	ES			*... With concrete slab at base.*	3.00	(0.90)	332.12	
				Base of Excavation at 3.00m				

General Remarks:
Unstable in Made Ground from surface to base with much collapse in from the sides of the pit. No further progress below 3.00m depth due to concrete slab at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a

Trialpit No
TP_PH1a_102
Page No. 1 of 1

Method: Trial Pit	Date(s): 19/02/2025		
Client: Trivallis	Co-ords: 300069.92, 195048.92	Dimensions: m	Scale: 1:20
Hydrock Project No: 30603	Ground Level: 336.13m OD		

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark orangish brown slightly gravelly sandy TOPSOIL. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded flint and sandstone with occasional gravel sized fragments of brick.	0.20	(0.20)	335.93	
				MADE GROUND: Loose brown and reddish brown mottled slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse and rare cobble of subangular to well rounded sandstone with abundant gravel and cobble sized fragments of brick, concrete and breezeblock, with rare to occasional plastic bag fragments, timber, wire and rebar.				
0.80 - 1.10	LB					(1.50)		
				... With a brick wall below 1.0m in south end of the pit.	1			
1.50 - 1.70	ES							
				... With concrete slab at base.	1.70		334.43	
				Base of Excavation at 1.70m				
					2			
					3			
					4			

General Remarks:
Pit remained dry. Unstable throughout with some collapse from the sides. No further progress below 1.70m due to concrete slab at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_103 Page No. 1 of 1
Method: Trial Pit	Date(s): 18/02/2025
Client: Trivallis	Co-ords: 300174.13, 195086.93
Hydrock Project No: 30603	Ground Level: 340.36m OD

Dimensions: m (m)

Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft dark brown sandy slightly gravelly TOPSOIL. Sand is fine. Gravel is fine to coarse angular to subangular sandstone and flint.	0.15	(0.15)	340.21	
0.20 - 0.60	LB			MADE GROUND: Brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone with occasional gravel sized fragments of concrete.	0.60	(0.45)	339.76	
0.30 - 0.50	ES			Completely weathered thinly to medium bedded SANDSTONE. Recovered as slightly sandy very clayey GRAVEL with medium to high cobble content of fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).				
				... With a horizon of orangish brown fine to coarse SAND at 0.60m to 0.80m depth.		(1.35)		
1.50 - 1.95	ES			*... Position terminated at 1.95m due to sandstone bedrock.*	1.95		338.41	
				Base of Excavation at 1.95m				

General Remarks:
Pit remained dry. Pit unstable in Made Ground between 0.15m and 0.60m. No further progress below 1.95m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_104 Page No. 1 of 1
Method: Trial Pit	Date(s): 18/02/2025
Client: Trivallis	Co-ords: 300253.37, 195094.92
Hydrock Project No: 30603	Ground Level: 342.70m OD

Dimensions: m (m)

Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft orangish brown slightly sandy slightly gravelly very clayey TOPSOIL. Sand is fine. Gravel is fine to medium flint.	0.20	(0.20)	342.50	
0.20 - 0.40 0.20 - 0.40	B ES			MADE GROUND: Loose dark greyish brown slightly gravelly very sandy silty CLAY. Sand is fine. Gravel is fine to coarse root fragments and flint with abundant medium to coarse gravel sized fragments of concrete brick, timber and rare rebar.	0.40	(0.20)	342.30	
				MADE GROUND: Loose dark brown mottled orangish brown silty gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular flint with abundant gravel to cobble sized fragments of brick, concrete, rebar, timber and wire. *... With concrete steps at 0.55m in the northern end of the pit dropping to 0.80m in the centre of the pit.* *... With concrete slab at the base of the southern end of pit at 0.95m depth.* *... With orange warning tape and plastic yellow gas pipe at 1.10m in the centre of the pit.*	1.10	(0.70)	341.60	
				Base of Excavation at 1.10m				

General Remarks:
Pit remained dry. Pit unstable throughout Made Ground from surface to base. No further progress below 1.10m due to yellow plastic gas pipe and concrete slab at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_104A Page No. 1 of 1

Method: Trial Pit	Date(s): 18/02/2025	Logged By:	Checked By: KG
Client: Trivallis	Co-ords: 300256.40, 195106.00	Stability:	Dimensions: m / m
Hydrock Project No: 30603	Ground Level: 344.54m OD	Plant:	Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.10	ES			Soft dark brown organic slightly sandy TOPSOIL with rare gravel of fine to coarse subangular to subrounded sandstone.. Sand is fine.	0.10	(0.10)	344.44	
				MADE GROUND: Dark greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone with occasional gravel sized fragments of concrete and brick.	0.80	(0.70)	343.74	
1.00 - 1.20	ES			Completely weathered SANDSTONE. Recovered as medium dense reddish brown and orangish brown mottled gravelly very clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	1.60	(0.80)	342.94	
1.60 - 1.80	LB			Partially weathered weak to moderately weak thinly bedded orangish brown, brown and grey multicoloured slightly clayey fine to coarse SANDSTONE. Recovered as sandy slightly clayey fine to coarse GRAVEL of angular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	1.80	(0.20)	342.74	
				... Position terminated at 1.80m due to sandstone bedrock. Base of Excavation at 1.80m				

General Remarks:
Pit remained dry. Minor instability within gravelly sand between 0.80m and 1.60m depth. No further progress below 1.00m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_105 Page No. 1 of 1
Method: Trial Pit	Date(s): 18/02/2025
Client: Trivallis	Co-ords: 300205.52, 195068.82
Hydrock Project No: 30603	Ground Level: 338.96m OD

Dimensions: m (m) | Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.20 - 0.70	LB			Soft orangish brown and brown mottled slightly sandy TOPSOIL Sand is fine. With occasional gravel sized fragments of brick and glass.	0.20	(0.20)	338.76	
0.60 - 0.90	ES			MADE GROUND: Brown sandy silty gravelly CLAY. Sand is fine to coarse. Gravel is fine to medium angular to subangular sandstone with gravel sized fragments of brick, concrete, breezeblock, blacktop, scrap metal, polystyrene, rare glass, plastic bag fragments and part of an old generator. *... With brick footing at northern end of the pit from 0.60m depth to base of pit.*		(0.90)		
0.90 - 1.10	ES			*... With a small pocket (0.05 x 0.1 x 0.1m) of medium gravel sized blacktop fragments at 0.80m.* *... With a horizon of grey fine to coarse SAND at 0.90m to 1.10m in the southern end of the pit,*	1.10		337.86	
				Completely weathered SANDSTONE. Recovered as loose reddish brown and orangish brown mottled slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE). *... Position terminated at 1.70m due to sandstone bedrock.*		(0.60)		
				Base of Excavation at 1.70m	1.70		337.26	

General Remarks:
Pit remained dry and stable. No further progress below 1.70m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_106 Page No. 1 of 1
Method: Trial Pit	Date(s): 20/02/2025
Client: Trivallis	Co-ords: 300232.72, 195040.01
Hydrock Project No: 30603	Ground Level: 334.75m OD

Dimensions: m (m)

Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft orangish brown slightly sandy slightly gravelly TOPSOIL. Sand is fine. Gravel is fine to coarse subangular to rounded sandstone with occasional brick fragments.	0.20	(0.20)	334.55	
0.40 - 0.50	ES			MADE GROUND: Brown and reddish brown mottled sandy slightly gravelly silty CLAY Sand is fine to coarse. Gravel is fine to medium subangular to subrounded sandstone with abundant whole bricks, occasional rebar and concrete fragments.				
0.50 - 1.00	B			*... With brick foundations in the east and west side of the pit between 0.60m and 1.70m depth.*	1.70	(1.50)	333.05	
				Completely weathered SANDSTONE. Recovered as medium dense orangish brown mottled reddish brown gravelly clayey fine to coarse SAND. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).	1.80	(0.10)	332.95	
				... With concrete slab and pea shingle at the southern end of the pit.				
				Base of Excavation at 1.80m				

General Remarks:
Pt remained dry. Pit unstable in Made Ground from surface to base. No further progress below 1.80m due to concrete slab and pea shingle at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec	Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_107 Page No. 1 of 1
Method: Trial Pit	Date(s): 19/02/2025	
Client: Trivallis	Co-ords: 299993.31, 194961.27	Dimensions: m m	Scale: 1:20
Hydrock Project No: 30603	Ground Level: 330.76m OD	

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				MADE GROUND: Reddish brown slightly sandy silty CLAY with abundant gravel sized fragments of angular brick and concrete.	0.20	(0.20)	330.56	
0.40 - 0.60	ES			MADE GROUND: Orangish brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium angular to subrounded sandstone with frequent gravel sized fragments of subangular to subrounded brick and concrete.	0.70	(0.50)	330.06	
2.00 - 2.50	B			MADE GROUND: Brown sandy silty GRAVEL of fine to medium subangular to subrounded flint with abundant gravel to boulder sized fragments of weakly cemented concrete with whole bricks and gravel sized fragments of brick, blacktop, scrap metal, wire and rebar. Large concrete fragments are c. 1.00m x 1.50m x 0.50m.	2.50	(1.80)	328.26	
				Base of Excavation at 2.50m				

General Remarks:
Pit remained dry. Pit very unstable in Made Ground and collapsing. No further progress below 2.50m due to very unstable and collapsing sides. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_108 Page No. 1 of 1
Method: Trial Pit	Date(s): 19/02/2025
Client: Trivallis	Co-ords: 300047.30, 194992.03
Hydrock Project No: 30603	Ground Level: 328.07m OD

Dimensions: m — m

Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft brown slightly gravelly sandy organic TOPSOIL. Sand is fine to coarse. Gravel is fine to medium subangular to subrounded sandstone with occasional gravel sized fragments of concrete and brick.	0.20	(0.20)	327.87	
				MADE GROUND: Dark brown slightly sandy slightly gravelly silty CLAY. Sand is fine to medium. Gravel is fine to coarse subangular to subrounded sandstone. With abundant gravel sized fragments of concrete, brick, wire and timber and rare fragments of old plastic yellow gas pipe.	1.70	(1.50)	326.37	
1.60 - 1.90	ES			Firm orangish brown very gravelly sandy CLAY. Sand is fine Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).				
2.20 - 2.90	LB			*... Position terminated at 2.90m due to sandstone bedrock.*	2.90	(1.20)	325.17	
				Base of Excavation at 2.90m				

General Remarks:
Pit remained dry. Pit unstable in Made Ground between 0.20m and 1.70m. No further progress below 2.90m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_109 Page No. 1 of 1
Method: Trial Pit	Date(s): 20/02/2025
Client: Trivallis	Co-ords: 300079.07, 195006.33
Hydrock Project No: 30603	Ground Level: 328.39m OD

Dimensions: m (m)

Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft orangish brown slightly gravelly sandy TOPSOIL. Sand is fine, Gravel is fine to coarse subangular to subrounded sandstone. With frequent brick fragments and rootlets.	0.20	(0.20)	328.19	
				MADE GROUND: Soft to firm dark brown with occasional orangish brown mottling slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to coarse sandstone with abundant gravel sized fragments of subangular to subrounded brick, concrete, timber and occasional rebar.				
0.90 - 1.20	B					(1.40)		
1.20 - 1.30	ES				1.60		326.79	
				Completely weathered SANDSTONE. Recovered as medium dense orangish brown slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is fine to coarse subangular to subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).				
2.00 - 2.40	B					(0.80)		
				... Position terminated at 2.4m due to sandstone bedrock.	2.40		325.99	
				Base of Excavation at 2.40m				

General Remarks:
Pit remained stable. Moderate water ingress between 0.20m and 0.50m in Made Ground. No further progress below 2.40m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_110 Page No. 1 of 1
Method: Trial Pit	Date(s): 19/02/2025
Client: Trivallis	Co-ords: 299984.92, 194916.10
Hydrock Project No: 30603	Ground Level: 326.47m OD

Dimensions: m (m:) Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.10 - 0.30	ES			Soft brown gravelly sandy organic TOPSOIL. Sand is fine to medium. Gravel is fine to coarse angular to subangular sandstone with frequent gravel sized fragments of subangular concrete.	0.30	(0.30)	326.17	
1.40 - 1.50	ES			MADE GROUND: Soft brown slightly gravelly sandy silty CLAY. Sand is fine to coarse. Gravel is fine to medium subangular sandstone with abundant gravel sized fragments of brick, concrete, timber, wire, rebar, glass and plastic, with occasional boulder sized fragments of reinforced concrete.		(1.68)		
				... With concrete slab at base.	1.98		324.49	
				Base of Excavation at 1.98m				

General Remarks:
Pit remained dry. Pit unstable in Made Ground and collapsing. No further progress below 1.98m due to concrete slab at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_111 Page No. 1 of 1
Method: Trial Pit	Date(s): 20/02/2025
Client: Trivallis	Co-ords: 300044.28, 194961.17
Hydrock Project No: 30603	Ground Level: 324.34m OD

Dimensions: m × m | Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
				Soft orangish brown slightly gravelly sandy TOPSOIL Sand is fine. Gravel is fine to coarse subangular to subrounded sandstone. With frequent brick fragments.	0.20	(0.20)	324.14	
0.60 - 0.90	ES			MADE GROUND: Dark grey sandy silty CLAY with abundant gravel to cobble sized fragments of brick, concrete, occasional rebar, whole bricks, asphalt and glass.	1.00	(0.80)	323.34	
1.60 - 1.90	ES			Firm orangish brown and reddish brown mottled sandy very gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse subangular to Gravel sized fragments of subrounded sandstone. (WEATHERED RHONDDA MEMBER SANDSTONE).		(1.40)		
1.80 - 2.40	B			*... Position terminated at 2.40m due to sandstone bedrock.*	2.40		321.94	
				Base of Excavation at 2.40m				

General Remarks:
Pit remained dry. Pit unstable in made Ground between 0.20m and 1.70m. No further progress below 2.40m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_112 Page No. 1 of 1
Method: Trial Pit	Date(s): 20/02/2025
Client: Trivallis	Co-ords: 300227.55, 195008.42
Hydrock Project No: 30603	Ground Level: 329.75m OD

Dimensions: m / m — Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.00 - 0.10	ES			Very soft dark brown organic slightly sandy TOPSOIL Sand is fine. With frequent gravel sized fragments of brick and glass.	0.20	(0.20)	329.55	
0.40 - 0.50	ES			MADE GROUND: Soft orangish brown sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded sandstone with occasional gravel sized fragments of brick and concrete.	0.50	(0.30)	329.25	
				MADE GROUND: Dense bluish grey sandy fine to medium GRAVEL of angular to subangular asphalt.	0.60	(0.10)	329.15	
				Base of Excavation at 0.60m				

General Remarks:
Pit remained dry and stable. No further progress below 0.60m due to pea shingle and possible service (unknown) at depth. Backfilled with arisings.

Logged in general accordance with BS5930:2015

Hydrock now Stantec

Project: Penrhys Phase 1a	Trialpit No TP_Ph1a_113 Page No. 1 of 1
Method: Trial Pit	Date(s): 18/02/2025
Client: Trivallis	Co-ords: 300209.58, 195097.42
Hydrock Project No: 30603	Ground Level: 343.68m OD

Dimensions: m (m) | Scale: 1:20

Samples / Tests			Water-Strikes	Stratum Description	Depth mbgl	Thickness (m)	Level m OD	Legend
Depth (m)	Type	Results						
0.05 - 0.15	ES			Soft dark brown slightly gravelly sandy TOPSOIL Sand is fine. Gravel is fine to coarse flint and sandstone.	0.15	(0.15)	343.53	
0.50 - 0.80	ES			MADE GROUND: Loose brownish gravelly clayey fine to coarse SAND. Gravel is fine to coarse angular to subangular sandstone. With abundant gravel sized fragments of concrete and rare brick. *... With a horizon of grey fine to coarse sand at 0.90m.*	1.00	(0.85)	342.68	
1.00 - 2.00	LB			Completely weathered moderately weak thinly bedded brown SANDSTONE. Recovered as orangish brown and brown sandy GRAVEL of fine to coarse sandstone with abundant cobbles of sandstone. Sand is fine to coarse. (WEATHERED RHONDDA MEMBER SANDSTONE). *... Becoming more consolidated and less weathered with depth.* *... Position terminated at 2.00m due to sandstone bedrock.*	2.00	(1.00)	341.68	
				Base of Excavation at 2.00m				

General Remarks:
Pit remained dry. Pit remained stable in Made Ground. with some spalling within the Rhondda Member Sandstone at depth. No further progress below 2.0m due to sandstone bedrock at base. Backfilled with arisings.

Logged in general accordance with BS5930:2015

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

///SAFER RIG SERVICES

Safer Rig Services
Portview Road
Avonmouth
Bristol
BS11 9JE

SPT Hammer Ref:	AR3654.24
Test Date:	02/04/2024
Report Date:	03/04/2024
File Name:	AR3654.24.spt
Test Operator:	MS

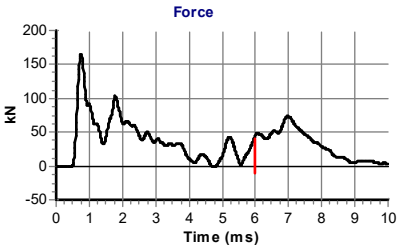
Instrumented Rod Data

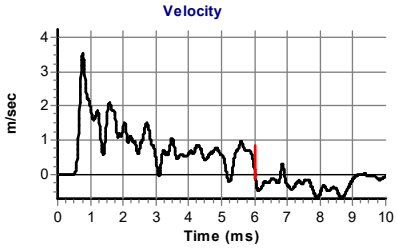
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.8
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	73534
Accelerometer No.2:	73538

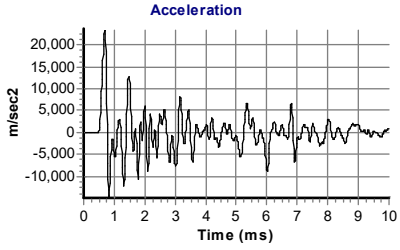
SPT Hammer Information

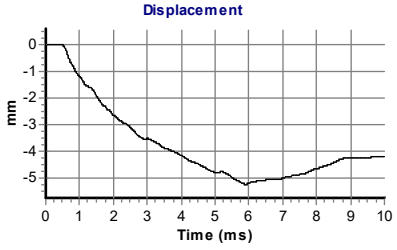
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	10.6

Comments / Location









Calculations

Area of Rod A (mm2):	1008
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	321

Energy Ratio E_r (%): **68**

Matt Stokes

Signed: M.Stokes

Title: Equipment Inspector

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Exploratory hole photographs

Photograph: 1	
Photograph reference: 30603-062510-00002	
Date: 18 February 2025	
Direction: 155	
Latitude: 51.6457577 Longitude: -3.44300957 Accuracy: 5.51	
Description: Concrete obstructions in TP104 at 0.8m	

Photograph: 2	
Photograph reference: 30603-062510-00003	
Date: 18 February 2025	
Direction: 258	
Latitude: 51.64579137 Longitude: -3.44297566 Accuracy: 7.66	
Description: Concrete obstructions at base of TP104 northern end.	

Photograph: 3	
Photograph reference: 30603-062510-00004	
Date: 18 February 2025	
Direction: 238	
Latitude: 51.64579958 Longitude: -3.44301635 Accuracy: 7.77	
Description: Topsoil arisings from TP 104	

Photograph: 4	
Photograph reference: 30603-062510-00005	
Date: 18 February 2025	
Direction: 114	
Latitude: 51.64579287 Longitude: -3.4430048 Accuracy: 17.4	
Description: Made ground arisings from TP104	

Photograph: 5	
Photograph reference: 30603-062510-00006	
Date: 18 February 2025	
Direction: 23	
Latitude: 51.64583777 Longitude: -3.44306412 Accuracy: 11	
Description: Made ground arisings from TP 104.	

Photograph: 6	
Photograph reference: 30603-062510-00007	
Date: 18 February 2025	
Direction: 161	
Latitude: 51.64575398 Longitude: -3.44293155 Accuracy: 10.8	
Description: T P104 Backfilled	

Photograph: 7	
Photograph reference: 30603-062510-00009	
Date: 18 February 2025	
Direction: 351	
Latitude: 51.64580472 Longitude: -3.44364462 Accuracy: 12.7	
Description: TP113 down pit view.	

Photograph: 8	
Photograph reference: 30603-062510-00011	
Date: 18 February 2025	
Direction: 338	
Latitude: 51.64568402 Longitude: -3.44409393 Accuracy: 6.13	
Description: TP103 setup for infiltration testing.	

Photograph: 9	
Photograph reference: 30603-062510-00012	
Date: 18 February 2025	
Direction: 359	
Latitude: 51.64544846 Longitude: -3.44361236 Accuracy: 5.11	
Description: Pl05- GRR, CAT and genny and fingertip search complete.	

Photograph: 10	
Photograph reference: 30603-062510-00014	
Date: 18 February 2025	
Direction: 327	
Latitude: 51.64573598 Longitude: -3.44375153 Accuracy: 7.41	
Description: TP105 downpit view.	

Photograph: 11	
Photograph reference: 30603-062510-00015	
Date: 20 February 2025	
Description: TP106 downpit view.	

Photograph: 12	
Photograph reference: 30603-062510-00017	
Date: 20 February 2025	
Description: TP106 spoil showing large concrete boulders and whole bricks.	

Photograph: 13	
Photograph reference: 30603-062510-00016	
Date: 18 February 2025	
Direction: 107	
Latitude: 51.64591861 Longitude: -3.44308068 Accuracy: 8.14	
Description: TP 104A downpit view.	

Photograph: 14	
Photograph reference: 30603-062510-00019	
Date: 20 February 2025	
Description: TP111 natural soils.	

Photograph: 15	
Photograph reference: 30603-062510-00020	
Date: 20 February 2025	
Description: TP109 downpit view,	

Photograph: 16	
Photograph reference: 30603-062510-00021	
Date: 20 February 2025	
Description: TP109 'topsoil' Made Ground.	

Photograph: 17	
Photograph reference: 30603-062510-00022	
Date: 20 February 2025	
Description: TP109 'general' Made Ground spoil.	

Photograph: 18	
Photograph reference: 30603-062510-00023	
Date: 18 February 2025	
Description: TP112 downpit view – showing pea shingle at southern end of pit.	

Photograph: 19	
Photograph reference: 30603-062510-00024	
Date: 18 February 2025	
Direction: 332	
Latitude: 51.6445222 Longitude: -3.44675831 Accuracy: 14.6	
Description: TP112 spoil – 'general' Made Ground.	

Photograph: 20	
Photograph reference: 30603-062510-00025	
Date: 21 February 2025	
Description: BH202 service inspection pit.	

Photograph: 21	
Photograph reference: 30603-062510-00026	
Date: 21 February 2025	
Description: BH202 service inspection pit spoil.	

Photograph: 22	
Photograph reference: 30603-062510-00027	
Date: 19 February 2025	
Direction: 279	
Latitude: 51.64537557 Longitude: -3.44558587 Accuracy: 15.6	
Description: Downpit view of tp102	

Photograph: 23	
Photograph reference: 30603-062510-00028	
Date: 19 February 2025	
Direction: 315	
Latitude: 51.64481937 Longitude: -3.44647861 Accuracy: 17.2	
Description: TP101 dowpit view	

Photograph: 24	
Photograph reference: 30603-062510-00029	
Date: 19 February 2025	
Direction: 2	
Latitude: 51.64412341 Longitude: -3.4468501 Accuracy: 9.85	
Description: Tp11p	

Photograph: 25	
Photograph reference: 30603-062510-00030	
Date: 19 February 2025	
Direction: 250	
Latitude: 51.64408246 Longitude: -3.44621913 Accuracy: 23.4	
Description: Tp108	

Photograph: 26	
Photograph reference: 30603-062510-00031	
Date: 24 February 2025	
Direction: 248	
Latitude: 51.6455832 Longitude: -3.44433708 Accuracy: 14	
Description: BH203 core run 1-2-18	

Photograph: 27	
Photograph reference: 30603-062510-00032	
Date: 24 February 2025	
Direction: 85	
Latitude: 51.64580292 Longitude: -3.44339994 Accuracy: 11.4	
Description: B1203 1.8-3-0m run.	

Photograph: 28	
Photograph reference: 30603-062510-00033	
Date: 24 February 2025	
Direction: 38	
Latitude: 51.64566186 Longitude: -3.44327762 Accuracy: 14.2	
Description: BH203 core in 3.0-4.5m	

Photograph: 29	
Photograph reference: 30603-062510-00034	
Date: 24 February 2025	
Direction: 303	
Latitude: 51.64583236 Longitude: -3.44340345 Accuracy: 7.5	
Description: BH203 4.5-6.0m	

Photograph: 30	
Photograph reference: 30603-062510-00035	
Date: 24 February 2025	
Direction: 284	
Latitude: 51.64581874 Longitude: -3.44357417 Accuracy: 8.18	
Description: Bh203 at 6-7.5m	

Photograph: 31	
Photograph reference: 30603-062510-00036	
Date: 24 February 2025	
Direction: 121	
Latitude: 51.6458271 Longitude: -3.44339134 Accuracy: 9.6	
Description: BH203 cor 7.5-8.0m	

Photograph: 32	
Photograph reference: 30603-062510-00037	
Date: 26 February 2025	
Direction: 314	
Latitude: 51.64470554 Longitude: -3.44540859 Accuracy: 4.7	
Description: BH 202 core run 1.2-2.0m	

Photograph: 33	
Photograph reference: 30603-062510-00038	
Date: 26 February 2025	
Direction: 300	
Latitude: 51.64474767 Longitude: -3.44542404 Accuracy: 4.1	
Description: BH202 core run 2.0_3.0m	

Photograph: 34	
Photograph reference: 30603-062510-00039	
Date: 26 February 2025	
Direction: 193	
Latitude: 51.64474895 Longitude: -3.44542643 Accuracy: 8.92	
Description: BH202 dynamic sampler run 3.0-3.8m	

Photograph: 35	
Photograph reference: 30603-062510-00040	
Date: 26 February 2025	
Direction: 264	
Latitude: 51.64474664 Longitude: -3.44531417 Accuracy: 6.38	
Description: BH202 core run 3.8-5.0m	

Photograph: 36	
Photograph reference: 30603-062510-00041	
Date: 26 February 2025	
Direction: 20	
Latitude: 51.64495116 Longitude: -3.44535616 Accuracy: 12.2	
Description: BH 202 core run 5.00-6.00m	

Photograph: 37	
Photograph reference: 30603-062510-00042	
Date: 27 February 2025	
Direction: 303	
Latitude: 51.64415039 Longitude: -3.4455694 Accuracy: 16	
Description: B1201 dynamic sample run.	

Photograph: 38	
Photograph reference: 30603-062510-00043	
Date: 27 February 2025	
Direction: 324	
Latitude: 51.64431788 Longitude: -3.44618952 Accuracy: 6.39	
Description: BH201 Core run 2.00-3.50m	

Photograph: 39	
Photograph reference: 30603-062510-00044	
Date: 27 February 2025	
Direction: 320	
Latitude: 51.64433489 Longitude: -3.44609479 Accuracy: 10.9	
Description: BH 201 core run 3.50m- 5.00m	

Photograph: 40	
Photograph reference: 30603-062510-00045	
Date: 27 February 2025	
Direction: 333	
Latitude: 51.64433007 Longitude: -3.44621127 Accuracy: 10.1	
Description: BH201 core run 5.00m -6.50m	

Photograph: 41	
Photograph reference: 30603-062510-00046	
Date: 27 February 2025	
Direction: 343	
Latitude: 51.64435798 Longitude: -3.44633151 Accuracy: 5.87	
Description: BH201 core run 6.5-8.00m.	

Appendix D Geotechnical test results and geotechnical plots

Geotechnical laboratory test results

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 77516

Client Ref: **30603**
Client PO: **PO39802**

Client: **Hydrock Limited**

Contract Title: **Penrhys Phase 1a**
For the attention of: **Emily Frankish**

Date Received: **10-03-2025**
Date Completed: **18-03-2025**
Report Date: **18-03-2025**

This report has been checked and approved by:

B. Evans

Brendan Evans
Office Administrator

Description	Qty
Determination of water content BS EN ISO 17892-1:2014	9
4 Point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	9
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	9

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 4 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	77516	
Project Name	Penrhys Phase 1a	
Date Tested	12/03/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH_Ph1a_203	1	B	1.20	-	1.50	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL
TP_Ph1a_101	4	B	2.10	-	2.50	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL
TP_Ph1a_104	7	B	0.20	-	0.40	Brown fine to coarse gravelly CLAY (rock)
TP_Ph1a_105	9	LB	0.20	-	0.70	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)
TP_Ph1a_106	10	B	0.50	-	1.00	Brown fine to coarse gravelly slightly sandy CLAY (rock)
TP_Ph1a_108	12	LB	2.20	-	2.90	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)
TP_Ph1a_109	13	B	0.90	-	1.20	Grey fine to coarse gravelly CLAY
TP_Ph1a_111	15	B	1.80	-	2.40	Brown fine to coarse gravelly slightly sandy CLAY
TP_Ph1a_113	16	LB	1.00	-	2.00	Brown fine to coarse gravelly sandy CLAY (rock)
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

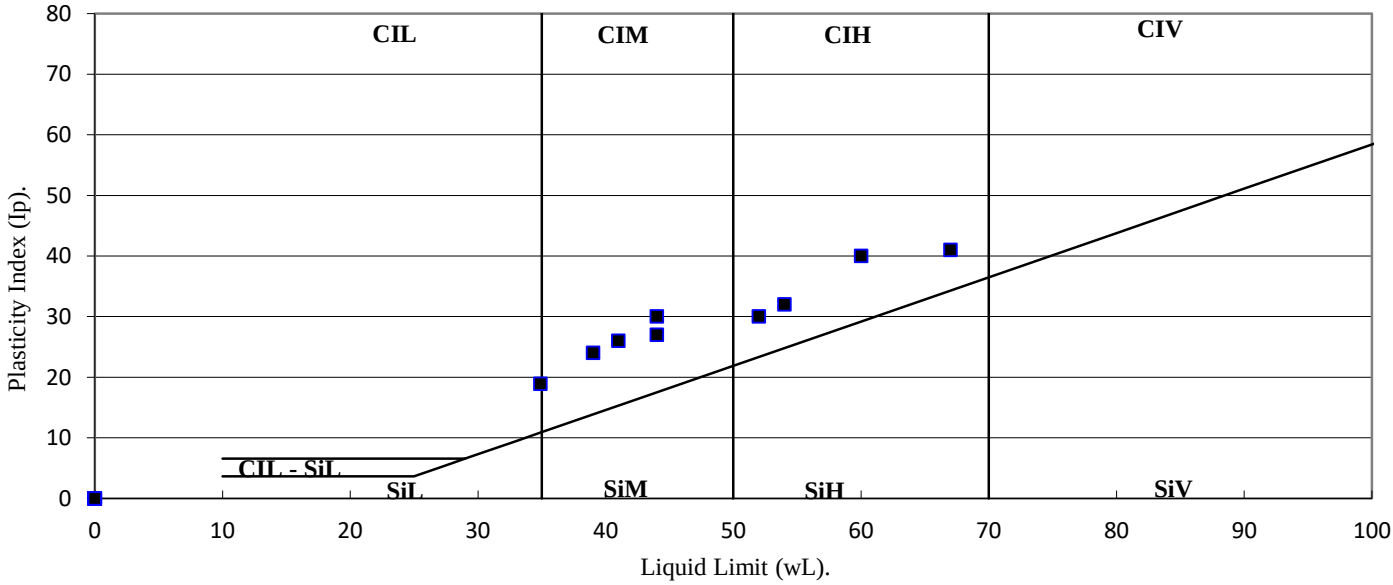
Operator
Aaron H.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX BS EN ISO 17892-12:2018+A2:2022 4 Point Liquid Limit BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content	
Contract Number	77516	
Project Name	Penrhys Phase 1a	
Date Tested	12/03/2025	
Test Comments	80g/30° Fall cone used with increasing water content	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH_Ph1a_203	1	B	1.20	-	1.50	29.9	67	26	41	9	CH High Plasticity
TP_Ph1a_101	4	B	2.10	-	2.50	17.3	39	15	24	10	CI Intermediate Plasticity
TP_Ph1a_104	7	B	0.20	-	0.40	36.3	60	20	40	51	CH High Plasticity
TP_Ph1a_105	9	LB	0.20	-	0.70	25.2	52	22	30	13	CH High Plasticity
TP_Ph1a_106	10	B	0.50	-	1.00	29.0	54	22	32	41	CH High Plasticity
TP_Ph1a_108	12	LB	2.20	-	2.90	21.6	44	14	30	11	CI Intermediate Plasticity
TP_Ph1a_109	13	B	0.90	-	1.20	25.8	44	17	27	43	CI Intermediate Plasticity
TP_Ph1a_111	15	B	1.80	-	2.40	20.4	41	15	26	61	CI Intermediate Plasticity
TP_Ph1a_113	16	LB	1.00	-	2.00	20.8	35	16	19	41	CL Low Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

SYMBOLS : NP = Non Plastic **NB: All liquid limits are 4 point and wet sieved**

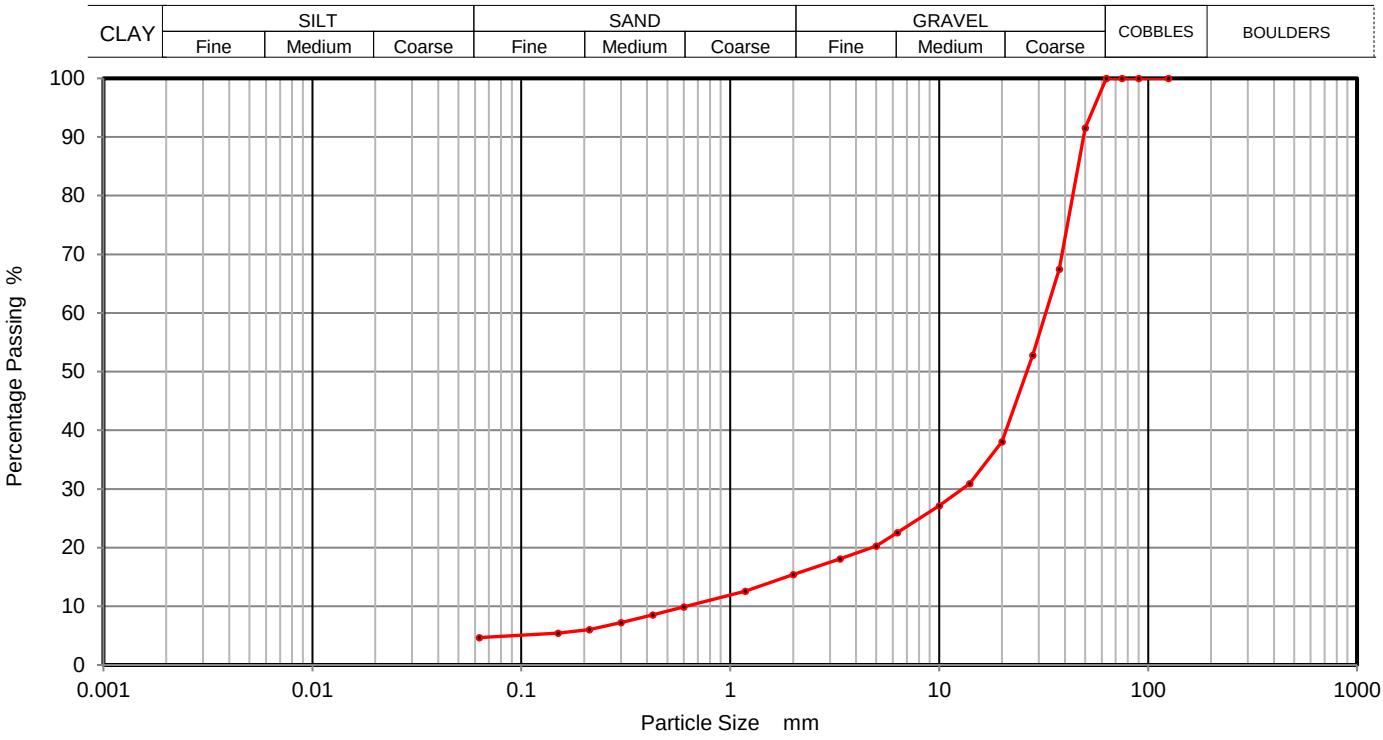
PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

Operator
Aaron H.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2	Contract Number	77516
		Borehole/Pit No.	BH_Ph1a_203
Project Name	**Penrhys Phase 1a**	Sample No.	1
Sample Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.20
		Depth Base	1.50
Date Tested	14/03/2025	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	67		
28	53		
20	38		
14	31		
10	27		
6.3	23		
5	20		
3.35	18		
2	15		
1.18	13		
0.63	10		
0.425	9		
0.30	7		
0.20	6		
0.15	5		
0.063	5		

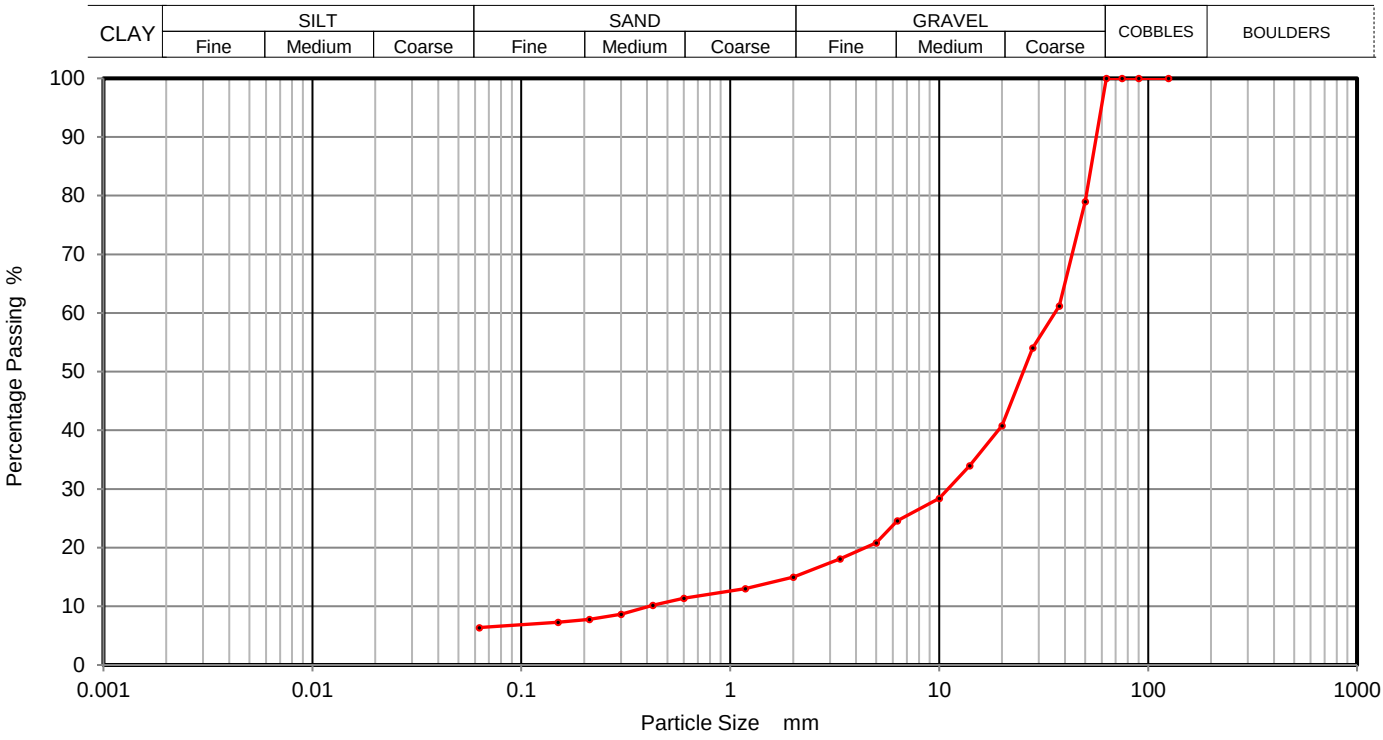
Sample Proportions	% dry mass
Cobbles	0
Gravel	85
Sand	10
Silt and Clay	5

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**77516**
		Borehole/Pit No.	**TP_Ph1a_101**
Project Name	**Penrhys Phase 1a**	Sample No.	**4**
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	**2.10**
		Depth Base	**2.50**
Date Tested	14/03/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	79		
37.5	61		
28	54		
20	41		
14	34		
10	28		
6.3	25		
5	21		
3.35	18		
2	15		
1.18	13		
0.63	11		
0.425	10		
0.30	9		
0.20	8		
0.15	7		
0.063	6		

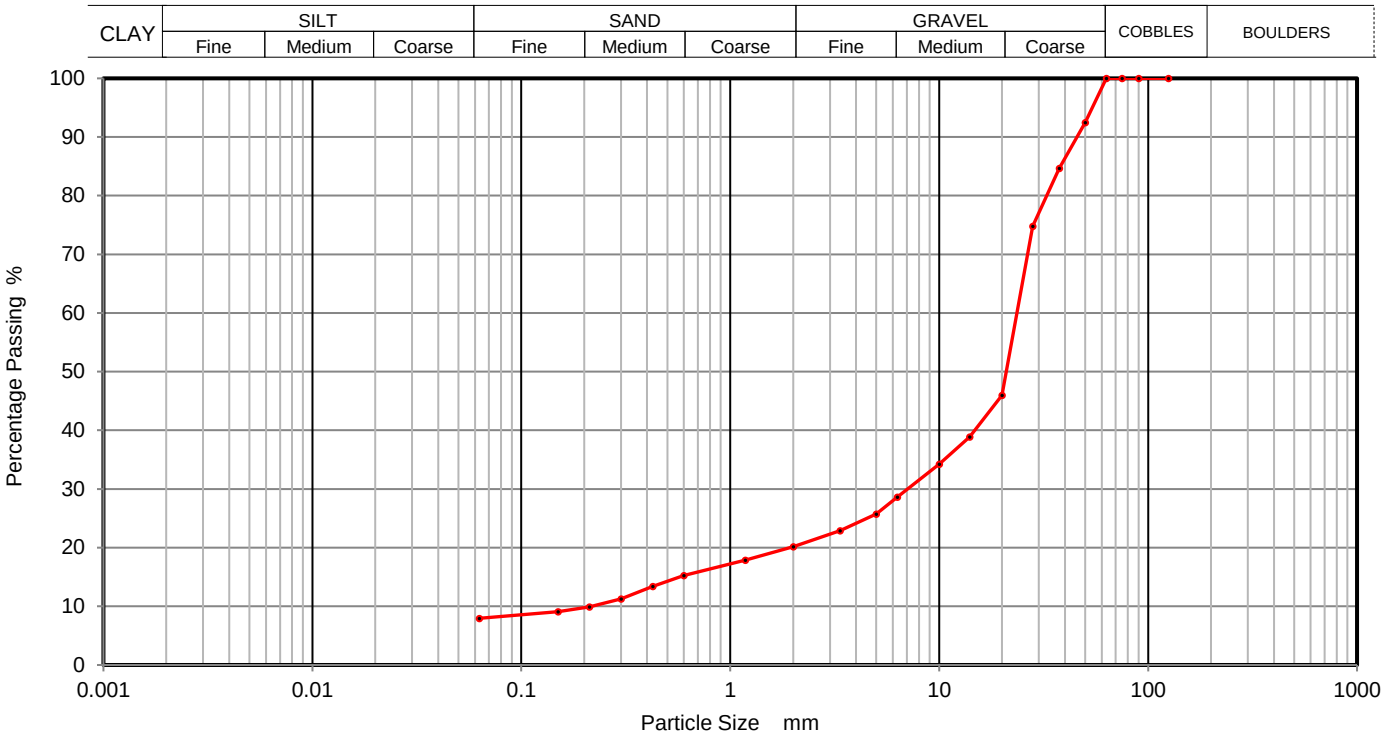
Sample Proportions	% dry mass
Cobbles	0
Gravel	85
Sand	9
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2	Contract Number	77516
		Borehole/Pit No.	TP_Ph1a_102
Project Name	Penrhys Phase 1a	Sample No.	5
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.80
		Depth Base	1.10
Date Tested	14/03/2025	Sample Type	LB



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	85		
28	75		
20	46		
14	39		
10	34		
6.3	29		
5	26		
3.35	23		
2	20		
1.18	18		
0.63	15		
0.425	13		
0.30	11		
0.20	10		
0.15	9		
0.063	8		

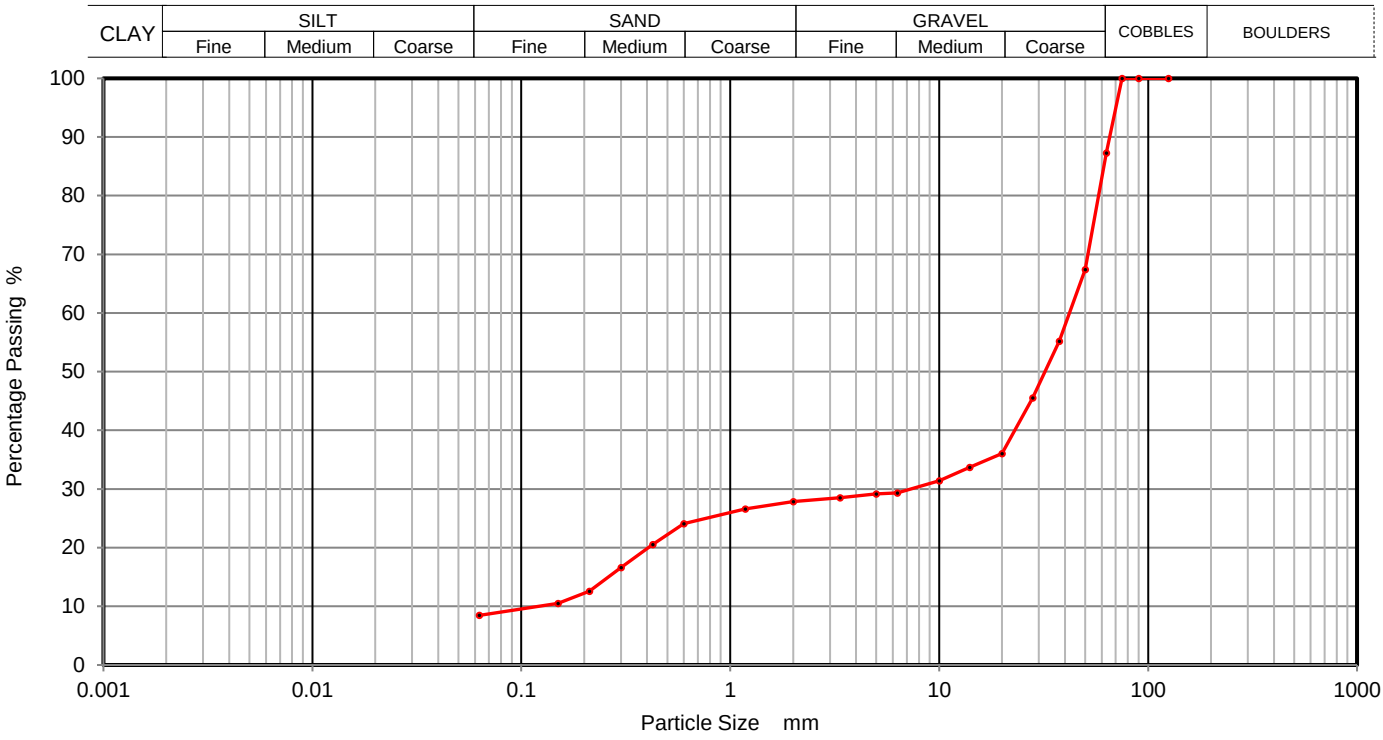
Sample Proportions	% dry mass
Cobbles	0
Gravel	80
Sand	12
Silt and Clay	8

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**77516**
		Borehole/Pit No.	**TP_Ph1a_103**
Project Name	**Penrhys Phase 1a**	Sample No.	**6**
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	**0.20**
		Depth Base	**0.60**
Date Tested	14/03/2025	Sample Type	**LB**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	87		
50	67		
37.5	55		
28	46		
20	36		
14	34		
10	31		
6.3	29		
5	29		
3.35	29		
2	28		
1.18	27		
0.63	24		
0.425	21		
0.30	17		
0.20	13		
0.15	10		
0.063	8		

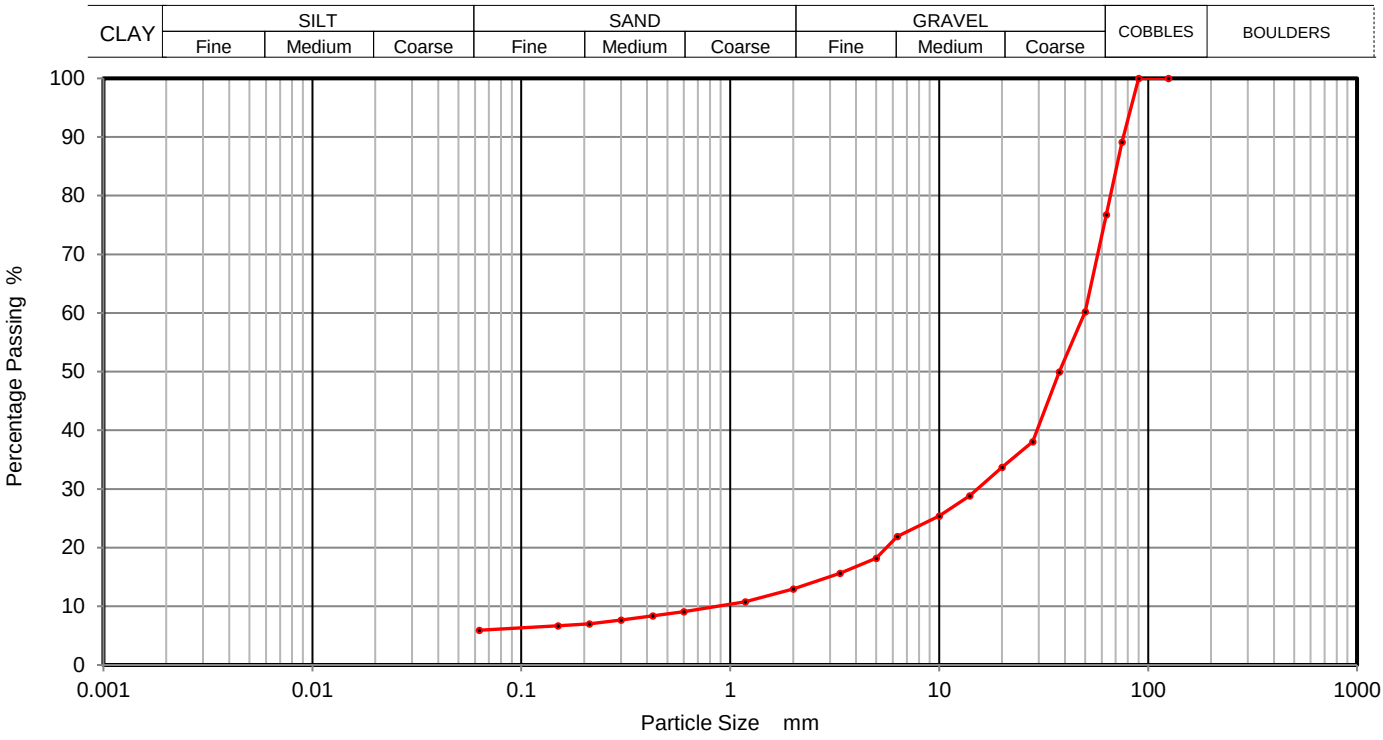
Sample Proportions	% dry mass
Cobbles	13
Gravel	59
Sand	20
Silt and Clay	8

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**77516**
		Borehole/Pit No.	**TP_Ph1a_104A**
Project Name	**Penrhys Phase 1a**	Sample No.	**8**
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	**1.60**
		Depth Base	**1.80**
Date Tested	14/03/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	89		
63	77		
50	60		
37.5	50		
28	38		
20	34		
14	29		
10	25		
6.3	22		
5	18		
3.35	16		
2	13		
1.18	11		
0.63	9		
0.425	8		
0.30	8		
0.20	7		
0.15	7		
0.063	6		

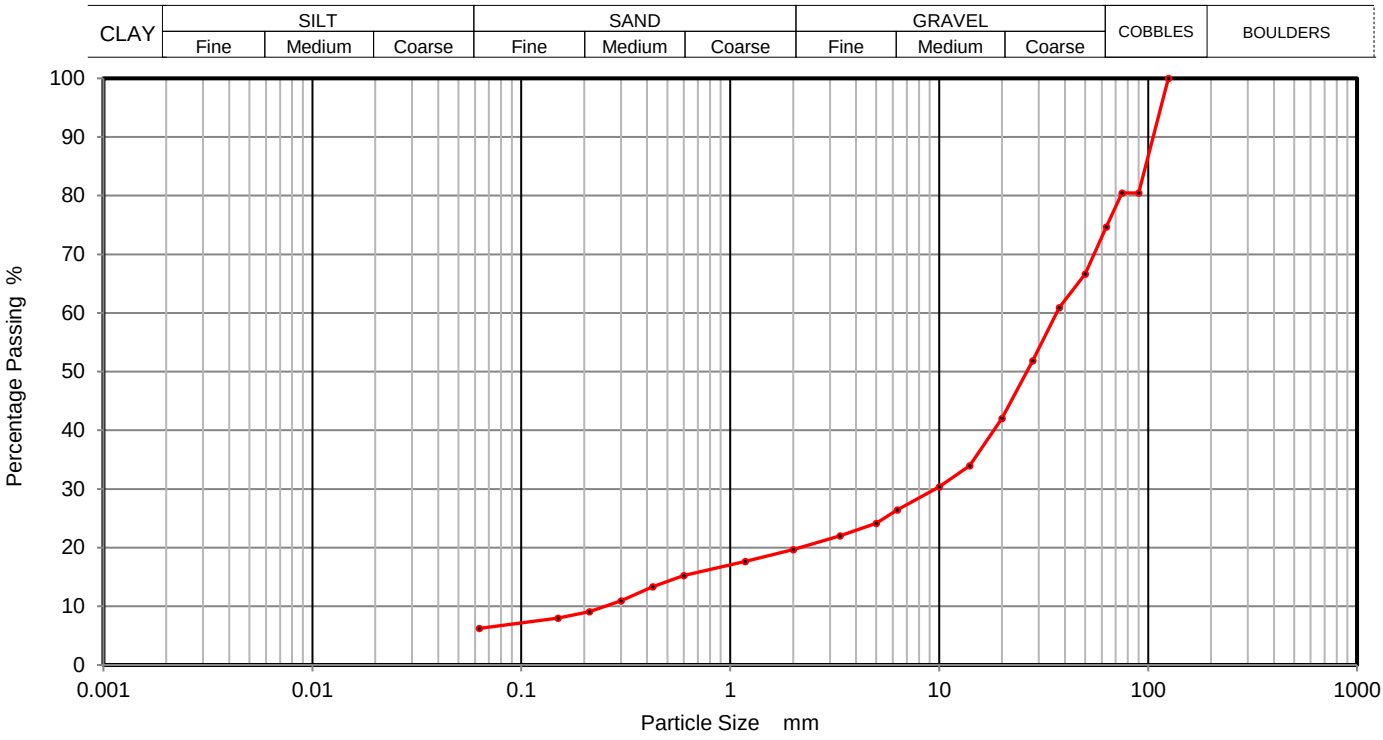
Sample Proportions	% dry mass
Cobbles	23
Gravel	64
Sand	7
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2**	Contract Number	**77516**
		Borehole/Pit No.	**TP_Ph1a_105**
Project Name	**Penrhys Phase 1a**	Sample No.	**9**
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	**0.20**
		Depth Base	**0.70**
Date Tested	14/03/2025	Sample Type	**LB**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	80		
75	80		
63	75		
50	67		
37.5	61		
28	52		
20	42		
14	34		
10	30		
6.3	26		
5	24		
3.35	22		
2	20		
1.18	18		
0.63	15		
0.425	13		
0.30	11		
0.20	9		
0.15	8		
0.063	6		

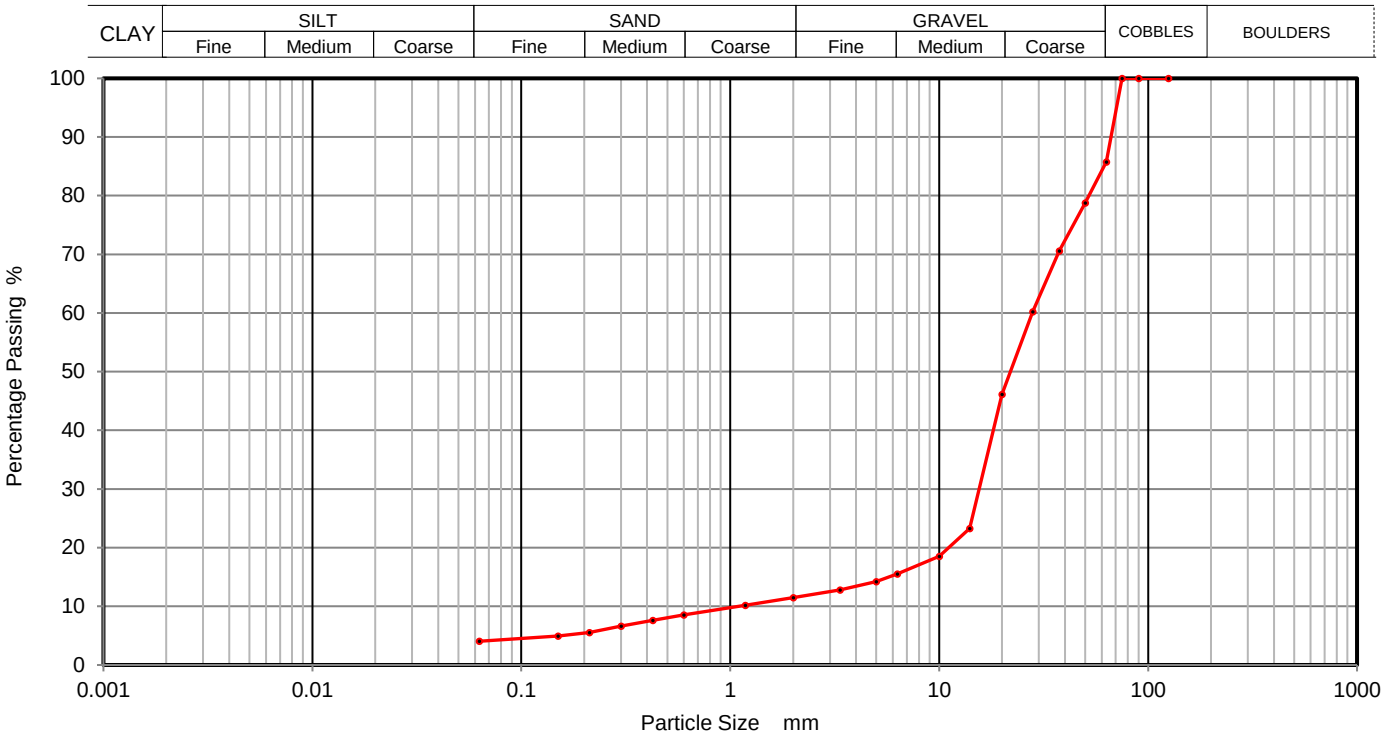
Sample Proportions	% dry mass
Cobbles	25
Gravel	55
Sand	14
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2	Contract Number	77516
		Borehole/Pit No.	TP_Ph1a_107
Project Name	Penrhys Phase 1a	Sample No.	11
Sample Description	Brown slightly silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	2.00
		Depth Base	2.50
Date Tested	14/03/2025	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	86		
50	79		
37.5	71		
28	60		
20	46		
14	23		
10	19		
6.3	16		
5	14		
3.35	13		
2	11		
1.18	10		
0.63	9		
0.425	8		
0.30	7		
0.20	6		
0.15	5		
0.063	4		

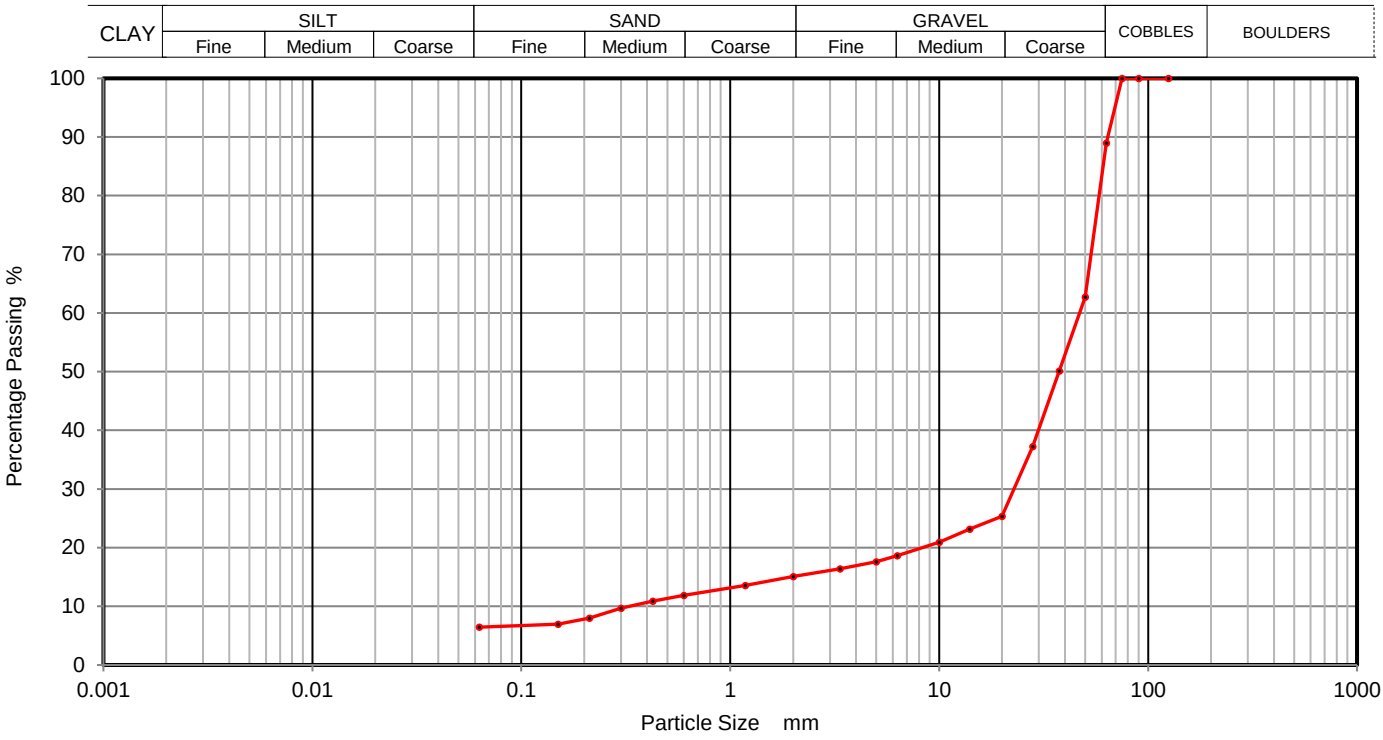
Sample Proportions	% dry mass
Cobbles	14
Gravel	75
Sand	7
Silt and Clay	4

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2	Contract Number	77516
		Borehole/Pit No.	TP_Ph1a_108
Project Name	**Penrhys Phase 1a**	Sample No.	**12**
Sample Description	Brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	**2.20**
		Depth Base	**2.90**
Date Tested	14/03/2025	Sample Type	**LB**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	89		
50	63		
37.5	50		
28	37		
20	25		
14	23		
10	21		
6.3	19		
5	18		
3.35	16		
2	15		
1.18	14		
0.63	12		
0.425	11		
0.30	10		
0.20	8		
0.15	7		
0.063	6		

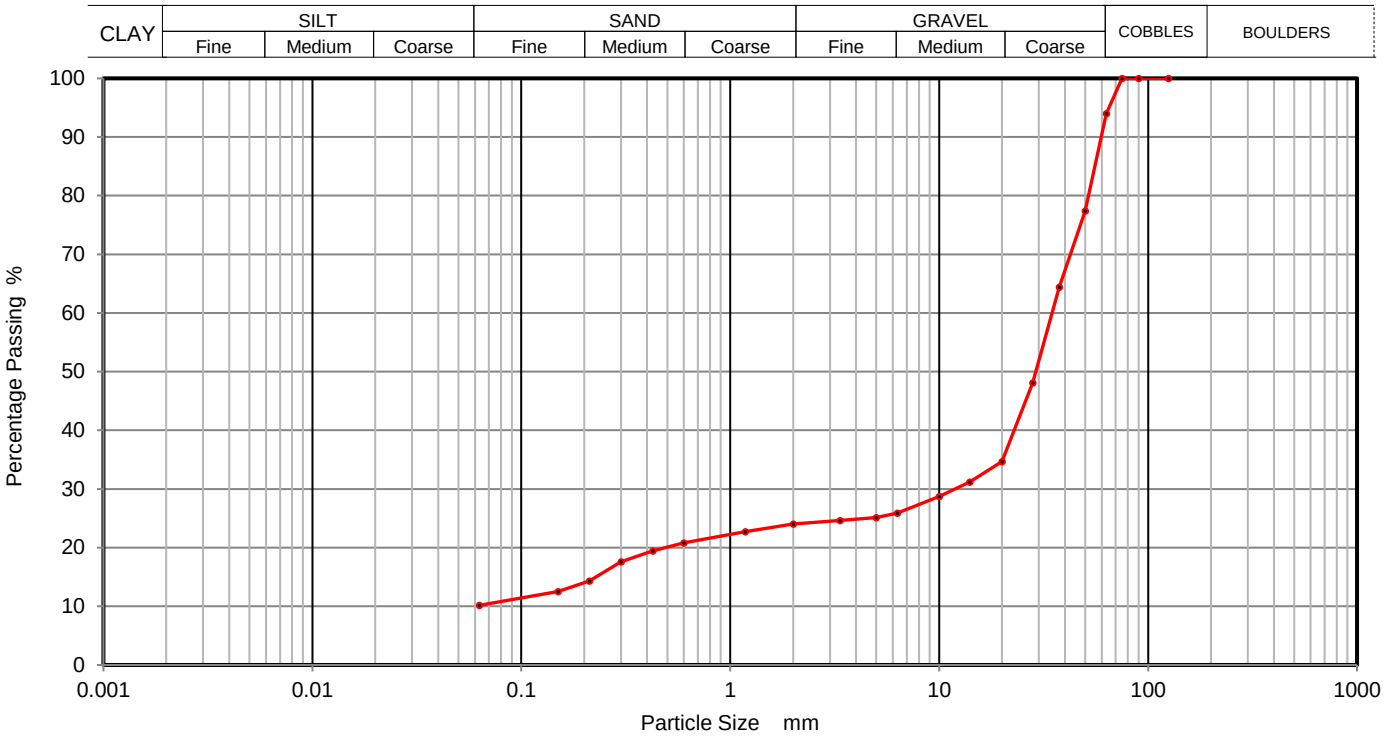
Sample Proportions	% dry mass
Cobbles	11
Gravel	74
Sand	9
Silt and Clay	6

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	PARTICLE SIZE DISTRIBUTION BS EN ISO 17892-4:2016 Wet Sieve, Clause 5.2	Contract Number	77516
		Borehole/Pit No.	TP_Ph1a_109
Project Name	**Penrhys Phase 1a**	Sample No.	**14**
Sample Description	Grey/brown silty/clayey fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	**2.00**
		Depth Base	**2.40**
Date Tested	14/03/2025	Sample Type	**B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	77		
37.5	64		
28	48		
20	35		
14	31		
10	29		
6.3	26		
5	25		
3.35	25		
2	24		
1.18	23		
0.63	21		
0.425	19		
0.30	18		
0.20	14		
0.15	13		
0.063	10		

Sample Proportions	% dry mass
Cobbles	6
Gravel	70
Sand	14
Silt and Clay	10

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

Geotechnical plots

Hydrock

Material Grading Compliance	
Location:	BH301
Depth:	0.5-0.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	87
50	76
37.5	70
20	57
10	28
6.3	21
5.0	18
2.00	13
1.18	11
0.600	9
0.425	7
0.212	5
0.150	4
0.063	3

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	✓
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	✓
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

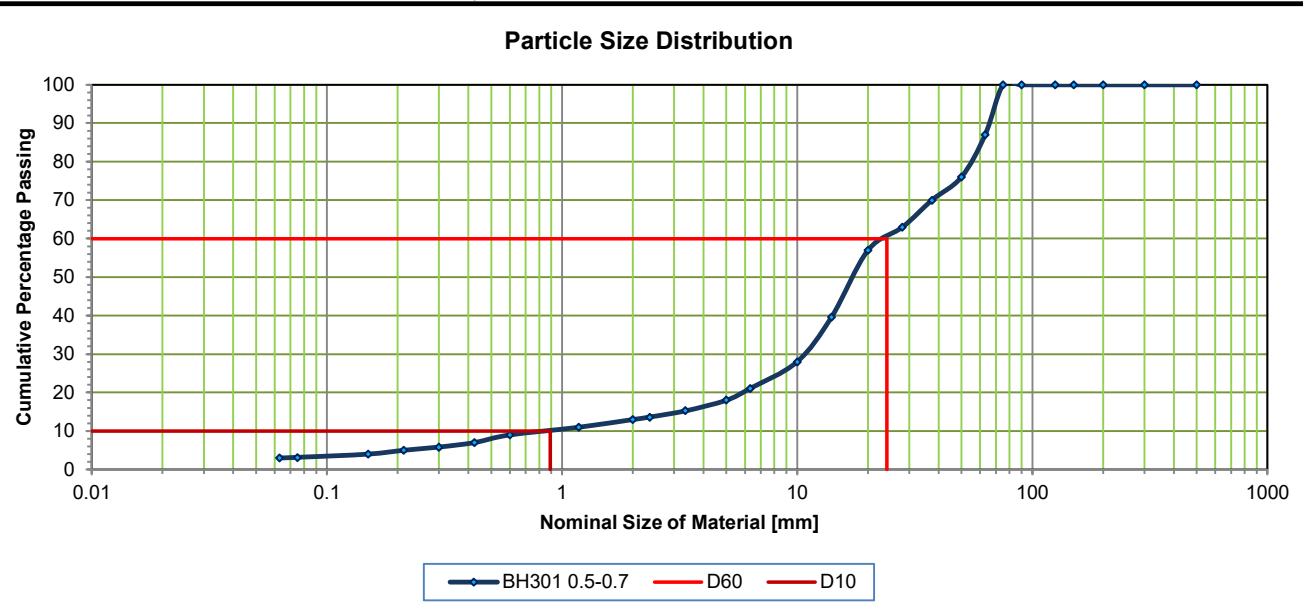
Uniformity Coefficient Calculation	
D60	24.038 mm
D10	0.890 mm
UC = D60 / D10	27.0

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	16%	
Gravel	Coarse	60 mm	20 mm	27%	
	Medium	20 mm	6.0 mm	37%	71%
	Fine	6.0 mm	2.0 mm	7%	
Sand	Coarse	2.00 mm	0.60 mm	4%	
	Medium	0.60 mm	0.20 mm	4%	10%
	Fine	0.20 mm	0.06 mm	2%	
SILT and CLAY		<0.06 mm		3%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	BH302
Depth:	0.5-0.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	82
37.5	78
20	59
10	36
6.3	30
5.0	27
2.00	20
1.18	18
0.600	15
0.425	13
0.212	10
0.150	9
0.063	7

Earthworks Materials Granular		Earthworks Materials Cohesive		Aggregates Concrete	
Group	Complies	Group	Complies	Group	Complies
Class 1A	✓	Class 2A		40mm SS	
Class 1B	✓	Class 2B		20mm SS	
Class 1C	✓	Class 2C		14mm SS	
Class 6A		Class 2D		10mm SS	
Class 6B		Class 7A		6mm SS	
Class 6C		Class 7C		5mm SS	
Class 6D		Class 7D		40mm All-in	
Class 6E	✓	Class 7E		20mm All-in	
Class 6F1		Class 7F		10mm All-in	
Class 6F2	✓	**Sub-base Materials Un-bound Granular**		5mm All-in	
Class 6F3*	✓			Concrete Sand	
Class 6F4		Group	Complies	Concrete - C	
Class 6F6		Type 1		Concrete - M	
Class 6F71		Type 2		Concrete - F	
Class 6F72		**Aggregates Drainage Materials**		Type A Sand	
Class 6H				Type B Sand	
Class 6I	✓	Group	Complies	Type S Sand	
Class 6J	✓	Type A Filter		Type G Sand	
Class 6K		Type B Filter			
Class 6L		40-5mm			
Class 6M	✓	20-5mm			
Class 6N	✓	14-5mm			
Class 6P	✓				

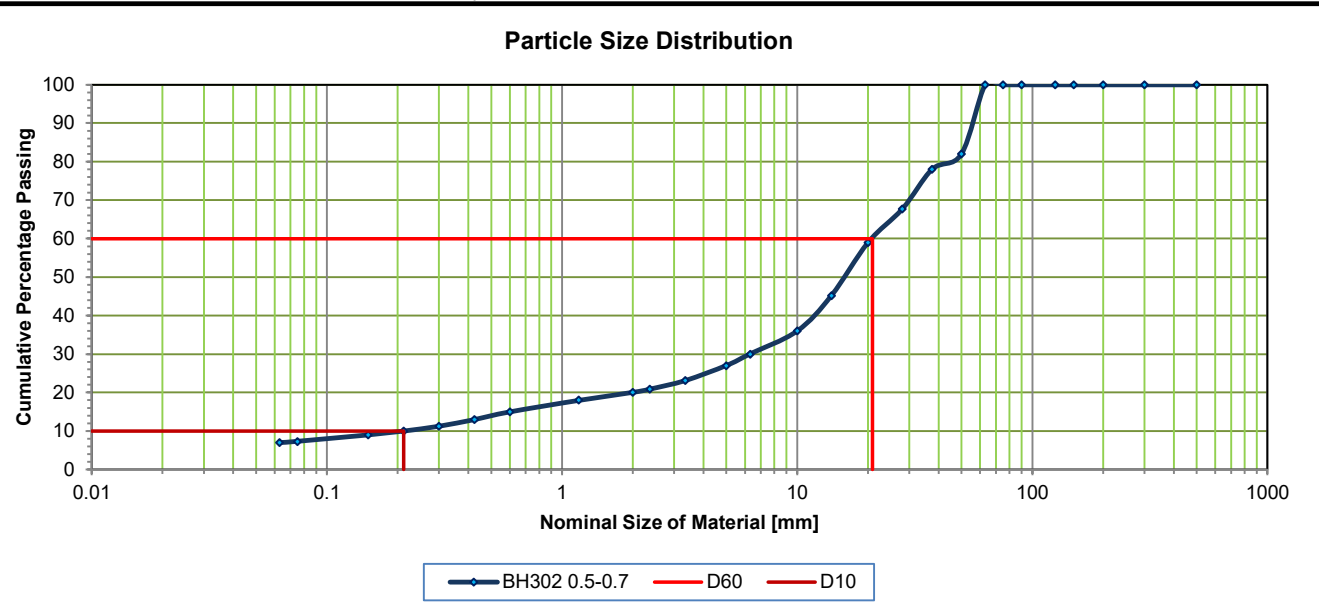
Uniformity Coefficient Calculation	
D60	20.921 mm
D10	0.212 mm
UC = D60 / D10	98.7

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**0%**	
Cobbles		200 mm	60 mm	**4%**	
Gravel	Coarse	60 mm	20 mm	37%	
	Medium	20 mm	6.0 mm	30%	**76%**
	Fine	6.0 mm	2.0 mm	9%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	5%	**13%**
	Fine	0.20 mm	0.06 mm	3%	
SILT and CLAY		<0.06 mm		**7%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP101 (GEL 24)
Depth:	0.5-0.6
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	100
37.5	100
20	78
10	59
6.3	47
5.0	44
2.00	33
1.18	28
0.600	25
0.425	22
0.212	19
0.150	17
0.063	13

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	✓
Class 6F1	✓
Class 6F2	
Class 6F3*	
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	✓
Class 6J	✓
Class 6K	
Class 6L	
Class 6M	
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

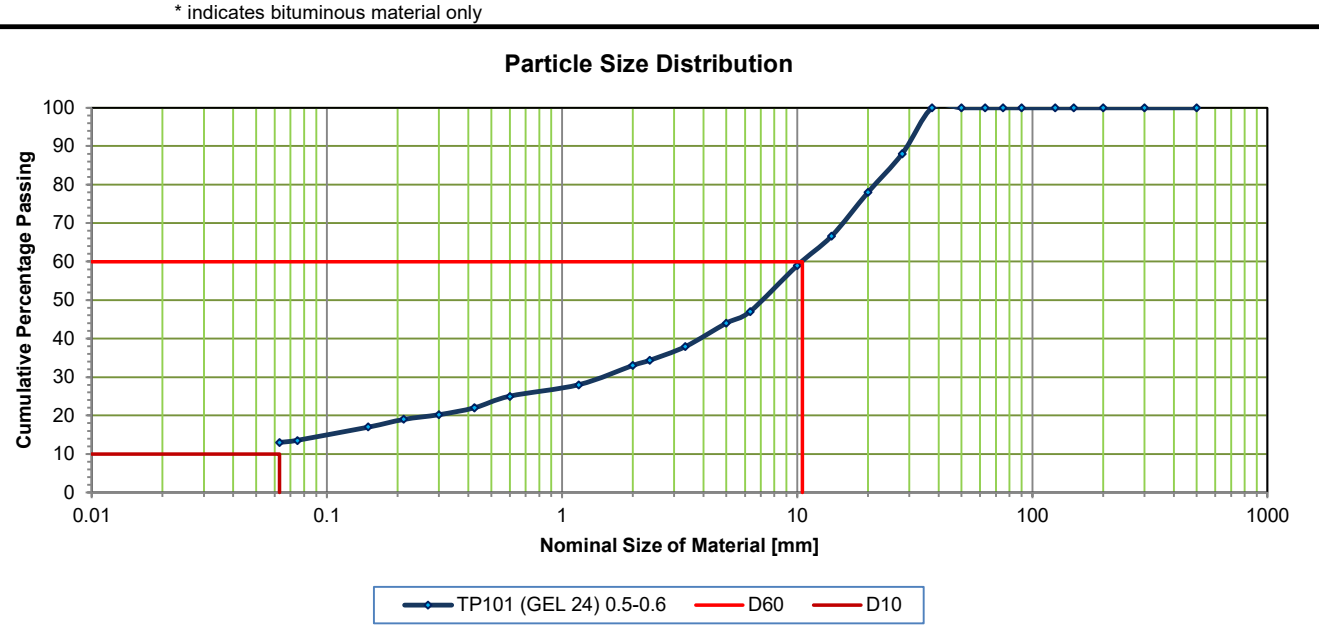
Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

Uniformity Coefficient Calculation	
D60	10.526 mm
#D10	0.063 mm
UC = D60 / D10	167.1

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	0%	
Gravel	Coarse	60 mm	20 mm	22%	
	Medium	20 mm	6.0 mm	32%	67%
	Fine	6.0 mm	2.0 mm	13%	
Sand	Coarse	2.00 mm	0.60 mm	8%	
	Medium	0.60 mm	0.20 mm	6%	20%
	Fine	0.20 mm	0.06 mm	6%	
SILT and CLAY		<0.06 mm		13%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements
#Uniformity Coefficient estimated on % passing 63µm, reported value is less than actual value
* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP201
Depth:	1.0-1.2
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	91
50	91
37.5	85
20	65
10	54
6.3	49
5.0	46
2.00	41
1.18	38
0.600	36
0.425	33
0.212	26
0.150	23
0.063	18

Earthworks Materials Granular	
Group	Complies
Class 1A	
Class 1B	
Class 1C	
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	
Class 6F3*	
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	
Class 6N	
Class 6P	

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	✓
Class 2D	
Class 7A	✓
Class 7C	
Class 7D	✓
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

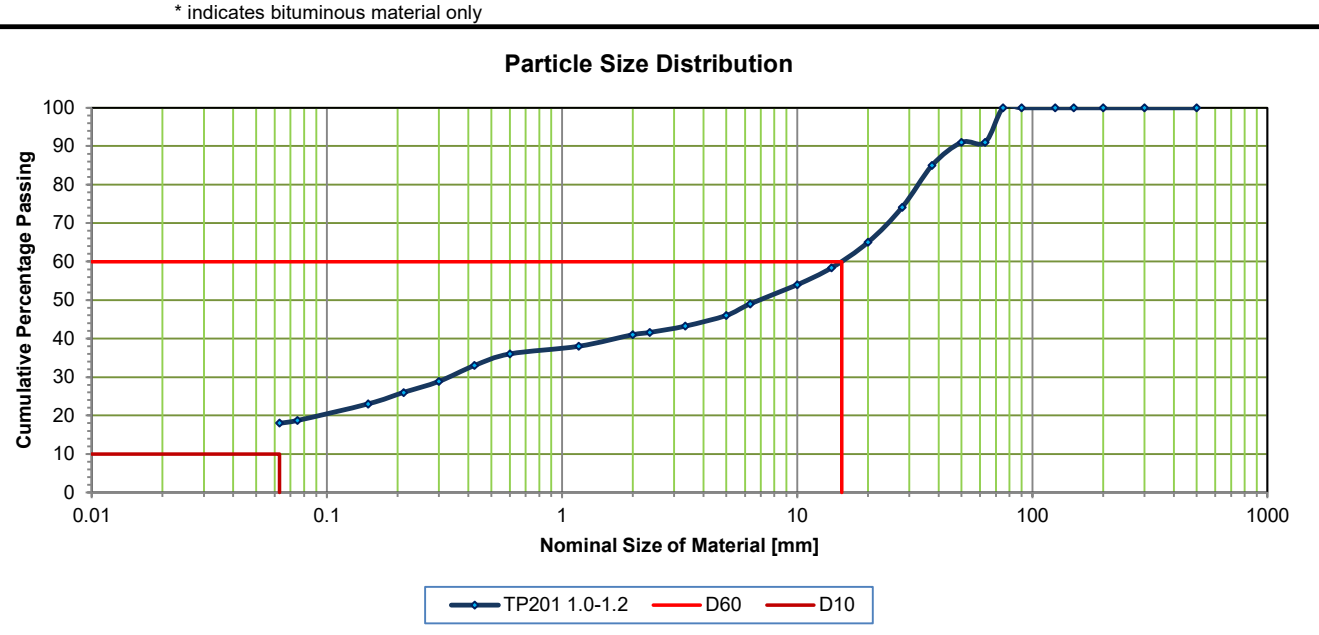
Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

Uniformity Coefficient Calculation	
D60	15.455 mm
#D10	0.063 mm
UC = D60 / D10	245.3

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**0%**	
Cobbles		200 mm	60 mm	**9%**	
Gravel	Coarse	60 mm	20 mm	26%	
	Medium	20 mm	6.0 mm	17%	**50%**
	Fine	6.0 mm	2.0 mm	7%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	11%	**23%**
	Fine	0.20 mm	0.06 mm	7%	
SILT and CLAY		<0.06 mm		**18%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements
#Uniformity Coefficient estimated on % passing 63µm, reported value is less than actual value
* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP201
Depth:	2.5-2.7
Description:	Rhondda Member

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	84
37.5	72
20	65
10	57
6.3	53
5.0	51
2.00	43
1.18	40
0.600	37
0.425	34
0.212	27
0.150	25
0.063	19

Earthworks Materials Granular	
Group	Complies
Class 1A	
Class 1B	
Class 1C	
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	
Class 6F3*	
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	
Class 6N	
Class 6P	

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	✓
Class 2D	
Class 7A	✓
Class 7C	
Class 7D	✓
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

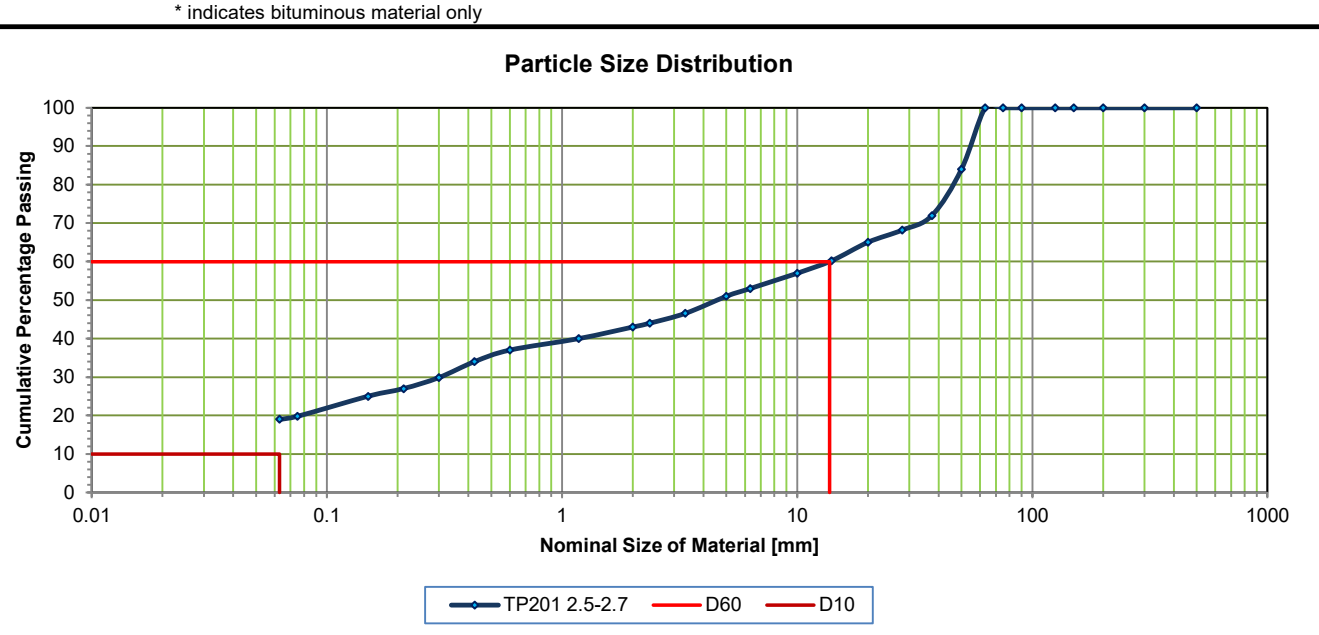
Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

Uniformity Coefficient Calculation	
D60	13.750 mm
#D10	0.063 mm
UC = D60 / D10	218.3

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	4%	
Gravel	Coarse	60 mm	20 mm	31%	
	Medium	20 mm	6.0 mm	12%	53%
	Fine	6.0 mm	2.0 mm	10%	
Sand	Coarse	2.00 mm	0.60 mm	6%	
	Medium	0.60 mm	0.20 mm	10%	24%
	Fine	0.20 mm	0.06 mm	8%	
SILT and CLAY		<0.06 mm		19%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements
#Uniformity Coefficient estimated on % passing 63µm, reported value is less than actual value
* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP202
Depth:	1.5-1.7
Description:	Rhondda Member

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	64
75	54
63	48
50	37
37.5	34
20	28
10	24
6.3	21
5.0	20
2.00	18
1.18	16
0.600	14
0.425	13
0.212	11
0.150	10
0.063	8

Earthworks Materials Granular		Earthworks Materials Cohesive		Aggregates Concrete	
Group	Complies	Group	Complies	Group	Complies
Class 1A		Class 2A		40mm SS	
Class 1B		Class 2B		20mm SS	
Class 1C	✓	Class 2C		14mm SS	
Class 6A		Class 2D		10mm SS	
Class 6B		Class 7A		6mm SS	
Class 6C		Class 7C		5mm SS	
Class 6D		Class 7D		40mm All-in	
Class 6E		Class 7E		20mm All-in	
Class 6F1		Class 7F		10mm All-in	
Class 6F2		**Sub-base Materials Un-bound Granular**		5mm All-in	
Class 6F3*				Concrete Sand	
Class 6F4		Group	Complies	Concrete - C	
Class 6F6		Type 1		Concrete - M	
Class 6F71		Type 2		Concrete - F	
Class 6F72		**Aggregates Drainage Materials**		Type A Sand	
Class 6H				Type B Sand	
Class 6I		Group	Complies	Type S Sand	
Class 6J		Type A Filter		Type G Sand	
Class 6K		Type B Filter			
Class 6L		40-5mm			
Class 6M		20-5mm			
Class 6N		14-5mm			
Class 6P					

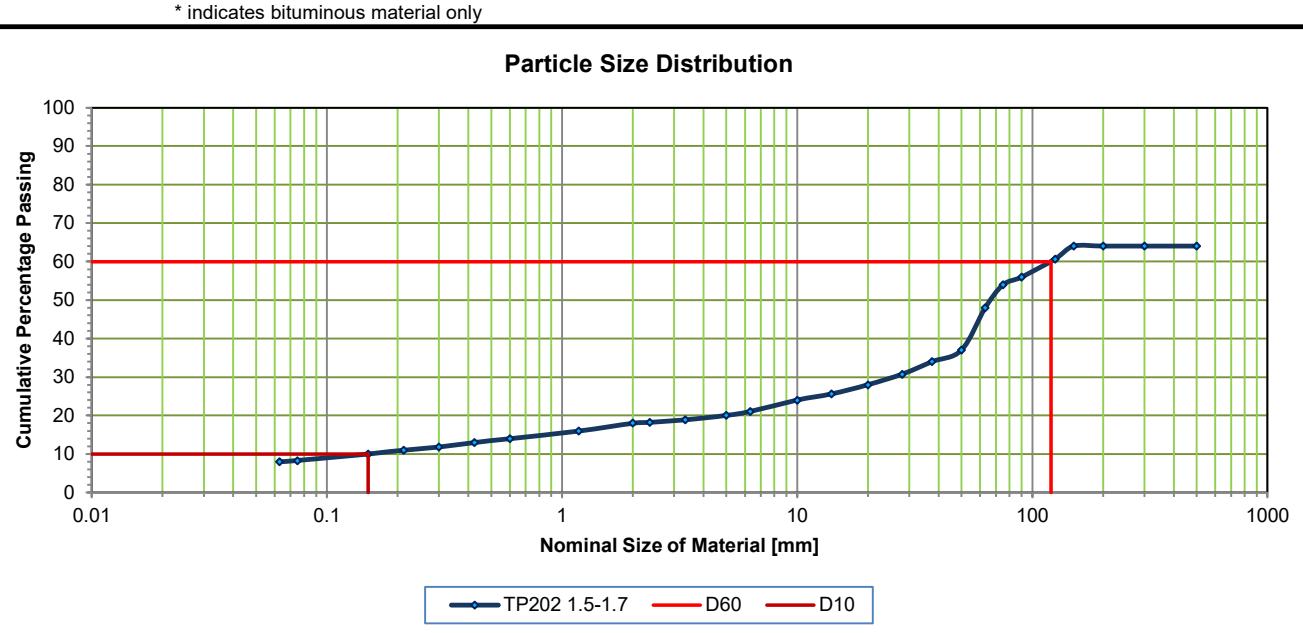
Uniformity Coefficient Calculation	
D60	120.000 mm
D10	0.150 mm
UC = D60 / D10	800.0

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**36%**	
Cobbles		200 mm	60 mm	**19%**	
Gravel	Coarse	60 mm	20 mm	17%	
	Medium	20 mm	6.0 mm	7%	**27%**
	Fine	6.0 mm	2.0 mm	3%	
Sand	Coarse	2.00 mm	0.60 mm	4%	
	Medium	0.60 mm	0.20 mm	3%	**10%**
	Fine	0.20 mm	0.06 mm	3%	
SILT and CLAY		<0.06 mm		**8%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP207A
Depth:	0.5-0.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	94
50	89
37.5	89
20	74
10	47
6.3	40
5.0	36
2.00	29
1.18	26
0.600	24
0.425	21
0.212	16
0.150	15
0.063	12

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	✓
Class 6F1	✓
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	✓
Class 6J	✓
Class 6K	
Class 6L	
Class 6M	
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

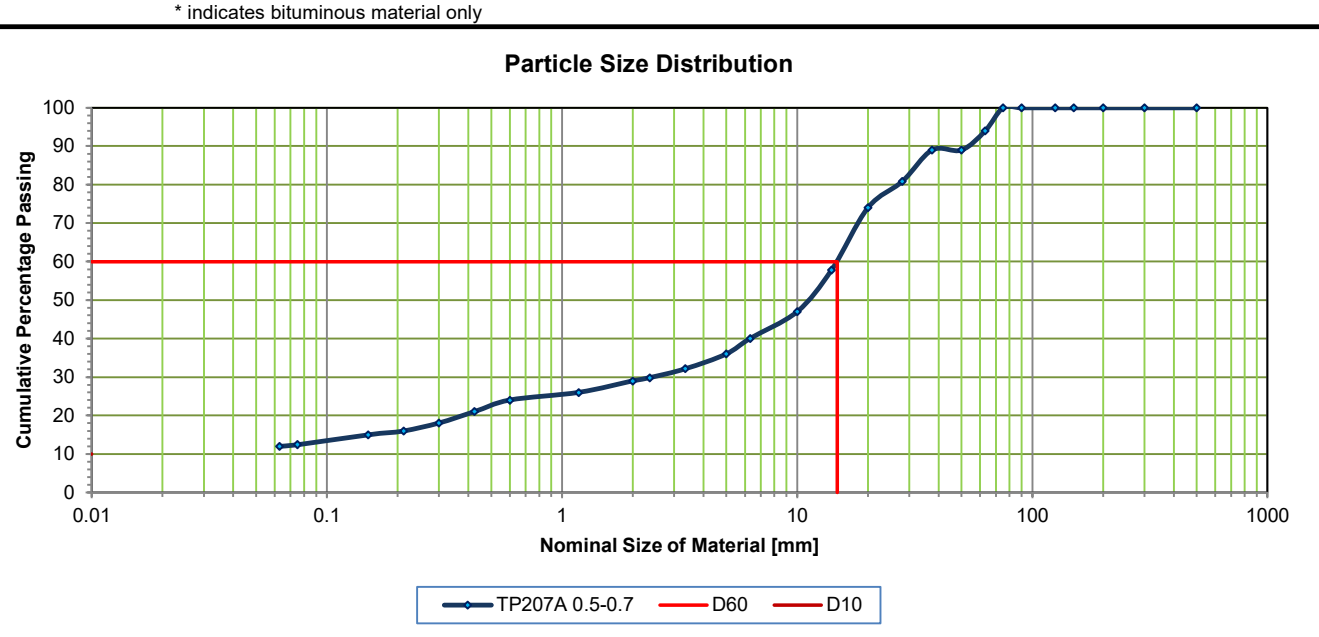
Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

Uniformity Coefficient Calculation	
D60	14.815 mm
#D10	0.005 mm
UC = D60 / D10	2963.0

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	7%	
Gravel	Coarse	60 mm	20 mm	19%	
	Medium	20 mm	6.0 mm	35%	64%
	Fine	6.0 mm	2.0 mm	10%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	8%	17%
	Fine	0.20 mm	0.06 mm	4%	
SILT and CLAY		<0.06 mm		12%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements
#Uniformity Coefficient estimated on % passing 63µm, reported value is less than actual value
* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	TP207A
Depth:	1.5-1.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	100
37.5	100
20	95
10	49
6.3	38
5.0	35
2.00	28
1.18	25
0.600	22
0.425	19
0.212	14
0.150	13
0.063	10

Earthworks Materials Granular		Earthworks Materials Cohesive		Aggregates Concrete	
Group	Complies	Group	Complies	Group	Complies
Class 1A	✓	Class 2A		40mm SS	
Class 1B	✓	Class 2B		20mm SS	
Class 1C	✓	Class 2C		14mm SS	
Class 6A		Class 2D		10mm SS	
Class 6B		Class 7A		6mm SS	
Class 6C		Class 7C		5mm SS	
Class 6D		Class 7D		40mm All-in	
Class 6E	✓	Class 7E		20mm All-in	
Class 6F1	✓	Class 7F		10mm All-in	
Class 6F2	✓	**Sub-base Materials Un-bound Granular**		5mm All-in	
Class 6F3*	✓			Concrete Sand	
Class 6F4		Group	Complies	Concrete - C	
Class 6F6		Type 1	✓	Concrete - M	
Class 6F71		Type 2	✓	Concrete - F	
Class 6F72		**Aggregates Drainage Materials**		Type A Sand	
Class 6H				Type B Sand	
Class 6I	✓	Group	Complies	Type S Sand	
Class 6J	✓	Type A Filter		Type G Sand	
Class 6K		Type B Filter			
Class 6L		40-5mm			
Class 6M	✓	20-5mm			
Class 6N	✓	14-5mm			
Class 6P	✓				

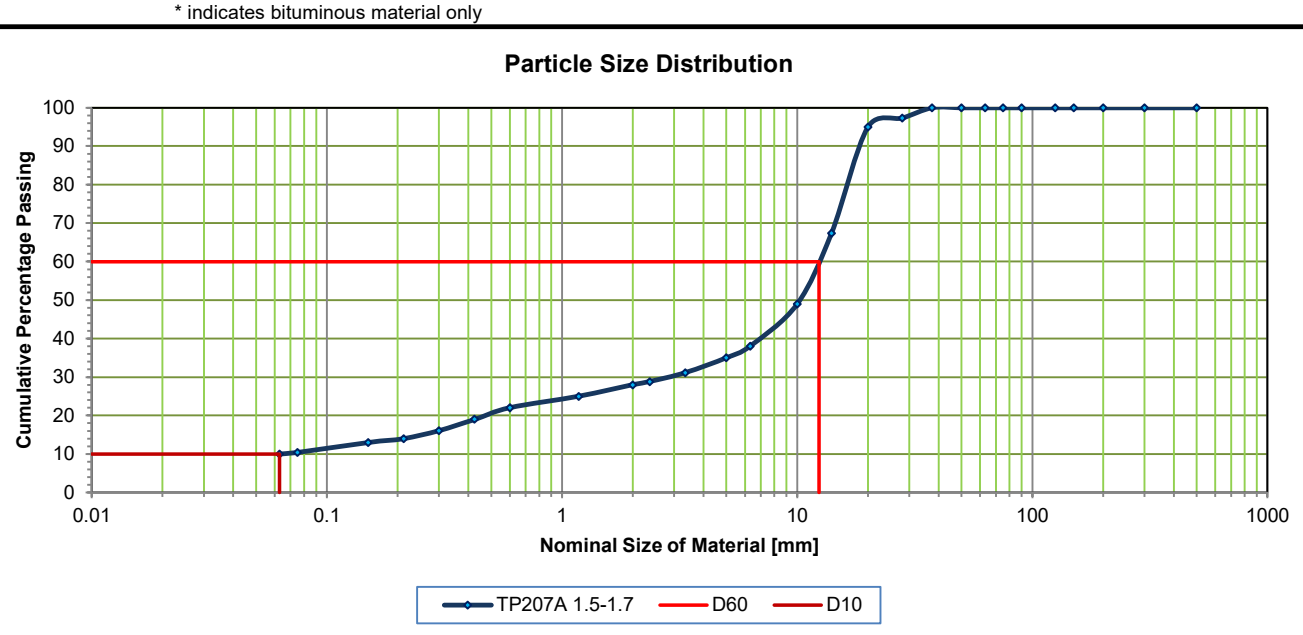
Uniformity Coefficient Calculation	
D60	12.391 mm
D10	0.063 mm
UC = D60 / D10	196.7

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**0%**	
Cobbles		200 mm	60 mm	**0%**	
Gravel	Coarse	60 mm	20 mm	5%	
	Medium	20 mm	6.0 mm	58%	**72%**
	Fine	6.0 mm	2.0 mm	9%	
Sand	Coarse	2.00 mm	0.60 mm	6%	
	Medium	0.60 mm	0.20 mm	8%	**18%**
	Fine	0.20 mm	0.06 mm	4%	
SILT and CLAY		<0.06 mm		**10%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	BH203
Depth:	1.2-1.5
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	92
37.5	67
20	38
10	27
6.3	23
5.0	20
2.00	15
1.18	13
0.600	10
0.425	9
0.212	6
0.150	5
0.063	5

Earthworks Materials Granular		Earthworks Materials Cohesive		Aggregates Concrete	
Group	Complies	Group	Complies	Group	Complies
Class 1A	✓	Class 2A		40mm SS	
Class 1B	✓	Class 2B		20mm SS	
Class 1C	✓	Class 2C		14mm SS	
Class 6A	✓	Class 2D		10mm SS	
Class 6B		Class 7A		6mm SS	
Class 6C		Class 7C		5mm SS	
Class 6D		Class 7D		40mm All-in	
Class 6E	✓	Class 7E		20mm All-in	
Class 6F1		Class 7F		10mm All-in	
Class 6F2	✓	**Sub-base Materials Un-bound Granular**		5mm All-in	
Class 6F3*	✓			Concrete Sand	
Class 6F4		Group	Complies	Concrete - C	
Class 6F6		Type 1		Concrete - M	
Class 6F71	✓	Type 2		Concrete - F	
Class 6F72		**Aggregates Drainage Materials**		Type A Sand	
Class 6H				Type B Sand	
Class 6I	✓	Group	Complies	Type S Sand	
Class 6J	✓	Type A Filter		Type G Sand	
Class 6K		Type B Filter			
Class 6L		40-5mm			
Class 6M	✓	20-5mm			
Class 6N	✓	14-5mm			
Class 6P	✓				

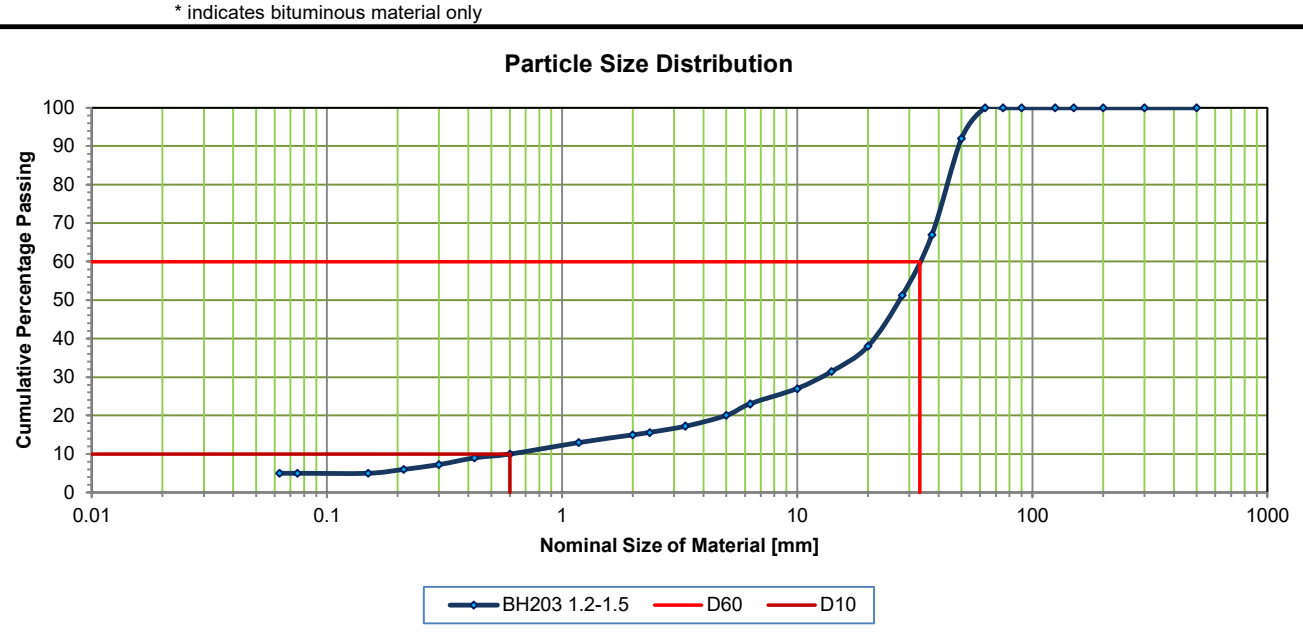
Uniformity Coefficient Calculation	
D60	33.276 mm
D10	0.600 mm
UC = D60 / D10	55.5

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**0%**	
Cobbles		200 mm	60 mm	**2%**	
Gravel	Coarse	60 mm	20 mm	60%	
	Medium	20 mm	6.0 mm	16%	**83%**
	Fine	6.0 mm	2.0 mm	7%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	4%	**10%**
	Fine	0.20 mm	0.06 mm	1%	
SILT and CLAY		<0.06 mm		**5%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP101
Depth:	2.1-2.5
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	79
37.5	61
20	41
10	28
6.3	25
5.0	21
2.00	15
1.18	13
0.600	11
0.425	10
0.212	8
0.150	7
0.063	6

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	✓
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	✓
Class 6F72	
Class 6H	
Class 6I	✓
Class 6J	✓
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

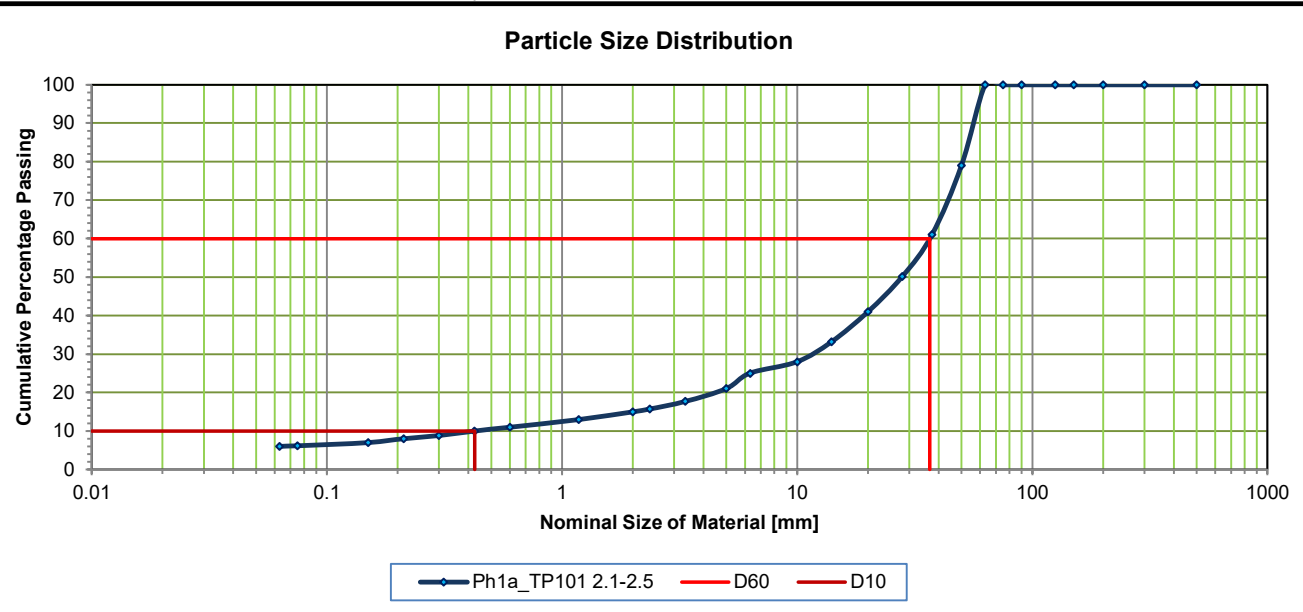
Uniformity Coefficient Calculation	
D60	36.625 mm
D10	0.425 mm
UC = D60 / D10	86.2

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	5%	
Gravel	Coarse	60 mm	20 mm	54%	
	Medium	20 mm	6.0 mm	17%	80%
	Fine	6.0 mm	2.0 mm	9%	
Sand	Coarse	2.00 mm	0.60 mm	4%	
	Medium	0.60 mm	0.20 mm	3%	9%
	Fine	0.20 mm	0.06 mm	2%	
SILT and CLAY		<0.06 mm		6%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP102
Depth:	0.8-1.1
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	100
50	92
37.5	85
20	46
10	34
6.3	29
5.0	26
2.00	20
1.18	18
0.600	15
0.425	13
0.212	10
0.150	9
0.063	8

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	✓
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	✓
Class 6J	✓
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

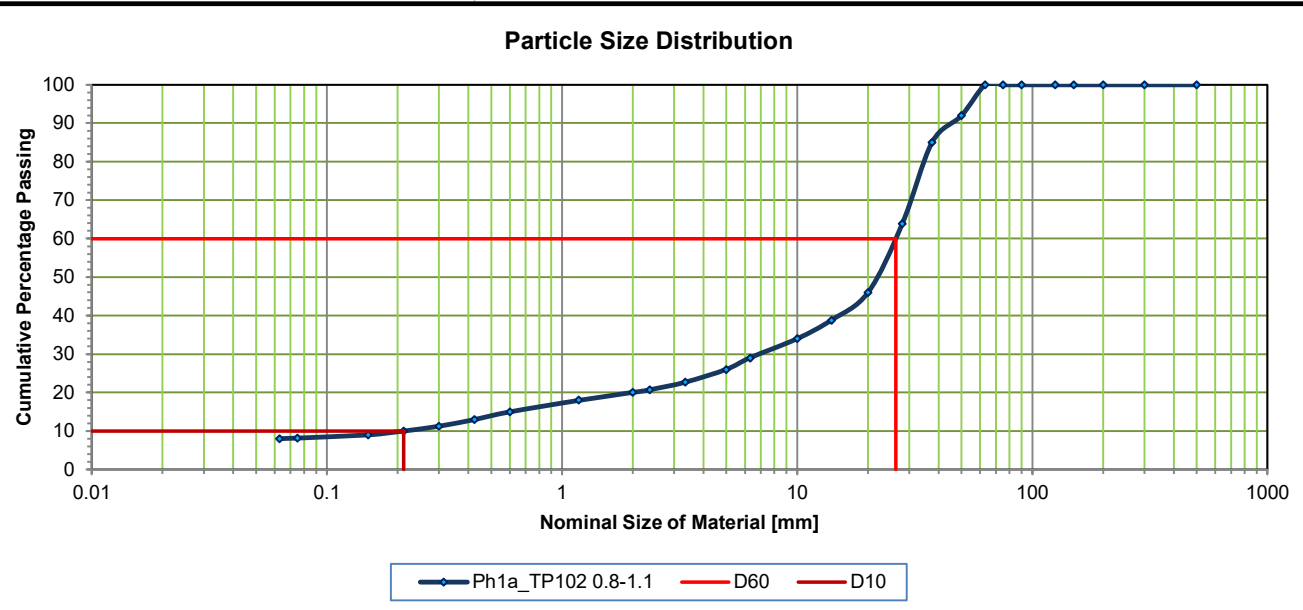
Uniformity Coefficient Calculation	
D60	26.282 mm
D10	0.212 mm
UC = D60 / D10	124.0

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	2%	
Gravel	Coarse	60 mm	20 mm	52%	
	Medium	20 mm	6.0 mm	18%	78%
	Fine	6.0 mm	2.0 mm	8%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	5%	12%
	Fine	0.20 mm	0.06 mm	2%	
SILT and CLAY		<0.06 mm		8%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP103
Depth:	0.2-0.6
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	87
50	67
37.5	55
20	36
10	31
6.3	29
5.0	29
2.00	28
1.18	27
0.600	24
0.425	21
0.212	13
0.150	10
0.063	8

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	✓
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	✓
Class 6J	✓
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

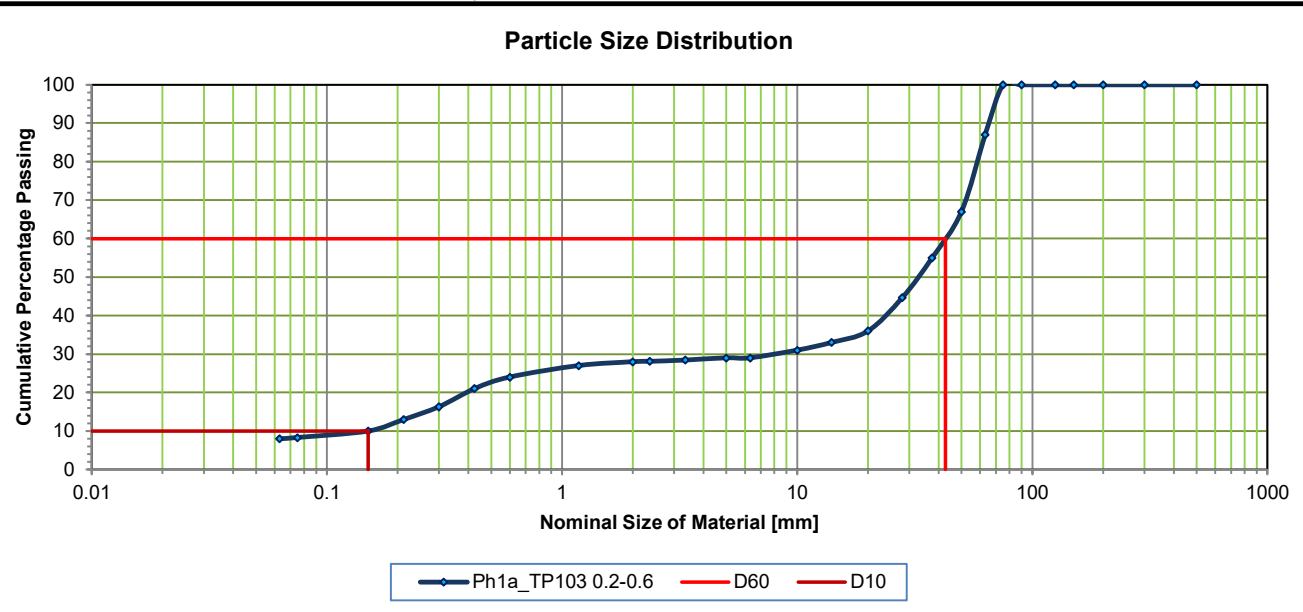
Uniformity Coefficient Calculation	
D60	42.708 mm
D10	0.150 mm
UC = D60 / D10	284.7

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	18%	
Gravel	Coarse	60 mm	20 mm	46%	
	Medium	20 mm	6.0 mm	7%	54%
	Fine	6.0 mm	2.0 mm	1%	
Sand	Coarse	2.00 mm	0.60 mm	4%	
	Medium	0.60 mm	0.20 mm	12%	20%
	Fine	0.20 mm	0.06 mm	4%	
SILT and CLAY		<0.06 mm		8%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP104a
Depth:	1.6-1.8
Description:	Rhondda Member

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	89
63	77
50	60
37.5	50
20	34
10	25
6.3	22
5.0	18
2.00	13
1.18	11
0.600	9
0.425	8
0.212	7
0.150	7
0.063	6

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	
Class 6F3*	
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	
Class 6N	
Class 6P	

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

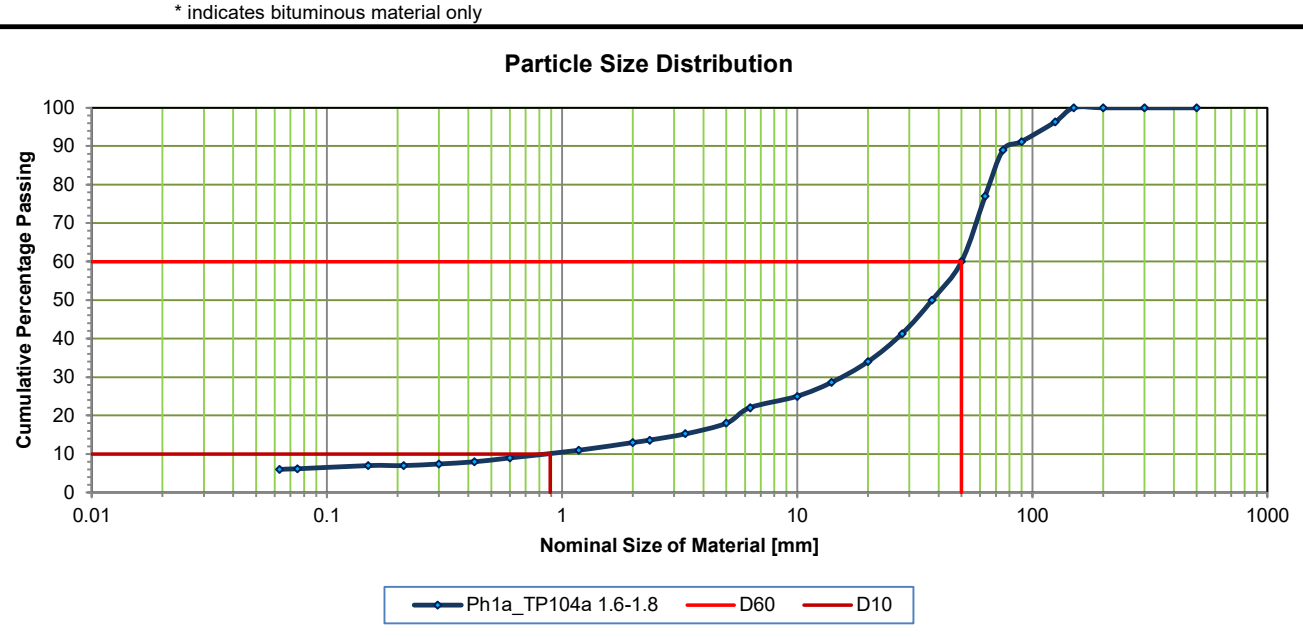
Uniformity Coefficient Calculation	
D60	50.000 mm
D10	0.890 mm
UC = D60 / D10	56.2

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	27%	
Gravel	Coarse	60 mm	20 mm	39%	
	Medium	20 mm	6.0 mm	13%	60%
	Fine	6.0 mm	2.0 mm	8%	
Sand	Coarse	2.00 mm	0.60 mm	4%	
	Medium	0.60 mm	0.20 mm	2%	7%
	Fine	0.20 mm	0.06 mm	1%	
SILT and CLAY		<0.06 mm		6%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP105
Depth:	0.2-0.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	80
63	75
50	67
37.5	61
20	42
10	30
6.3	26
5.0	24
2.00	20
1.18	18
0.600	15
0.425	13
0.212	9
0.150	8
0.063	6

Earthworks Materials Granular	
Group	Complies
Class 1A	
Class 1B	
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	
Class 6F3*	
Class 6F4	
Class 6F6	
Class 6F71	
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	
Class 6N	
Class 6P	

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

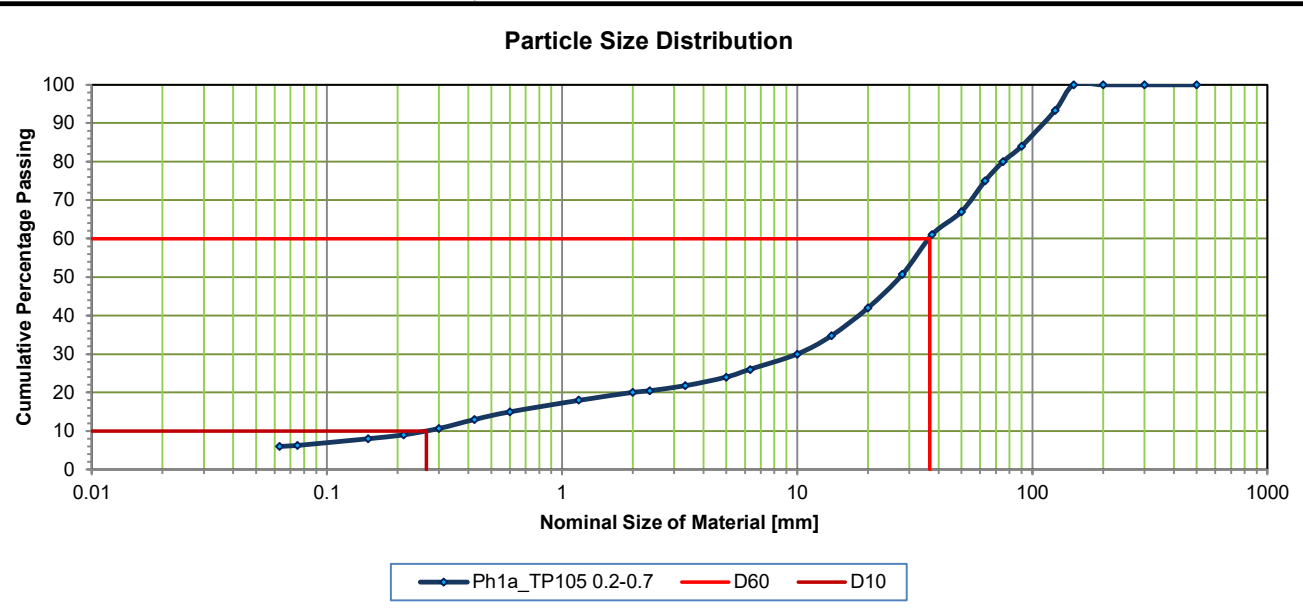
Uniformity Coefficient Calculation	
D60	36.579 mm
D10	0.265 mm
UC = D60 / D10	137.9

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	27%	
Gravel	Coarse	60 mm	20 mm	31%	
	Medium	20 mm	6.0 mm	16%	53%
	Fine	6.0 mm	2.0 mm	6%	
Sand	Coarse	2.00 mm	0.60 mm	5%	
	Medium	0.60 mm	0.20 mm	6%	14%
	Fine	0.20 mm	0.06 mm	3%	
SILT and CLAY		<0.06 mm		6%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP107
Depth:	0.2-0.7
Description:	Made Ground

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	86
50	79
37.5	71
20	46
10	19
6.3	16
5.0	14
2.00	11
1.18	10
0.600	9
0.425	8
0.212	6
0.150	5
0.063	4

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	✓
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	✓
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

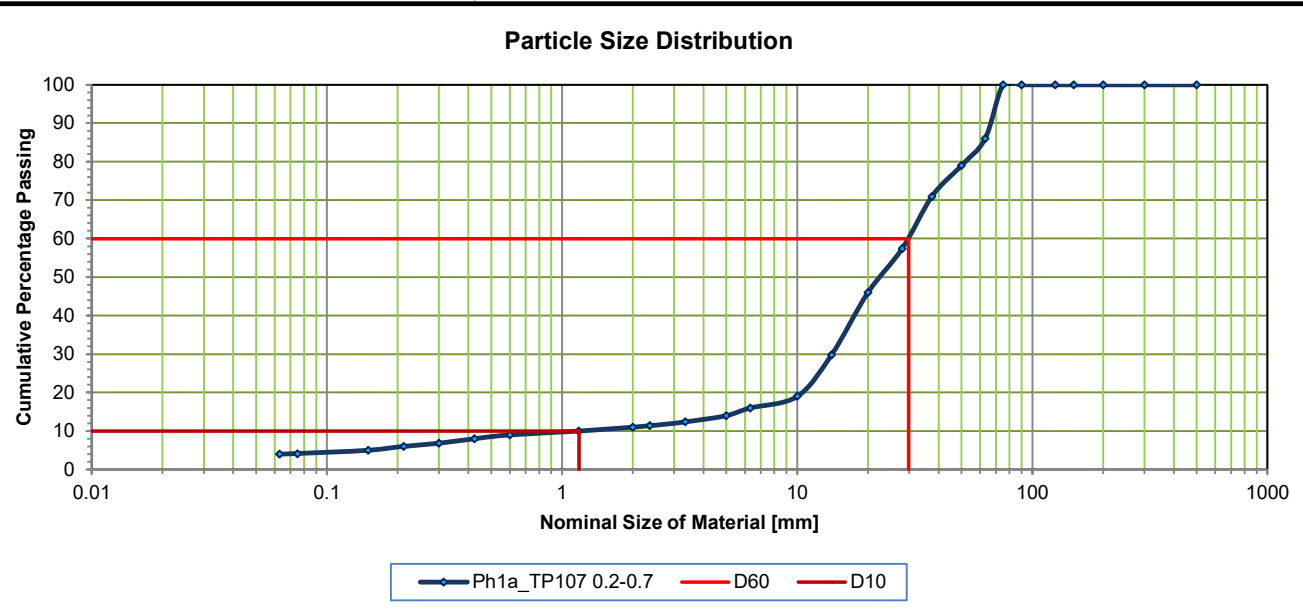
Uniformity Coefficient Calculation	
D60	29.800 mm
D10	1.180 mm
UC = D60 / D10	25.3

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	16%	
Gravel	Coarse	60 mm	20 mm	38%	
	Medium	20 mm	6.0 mm	30%	73%
	Fine	6.0 mm	2.0 mm	5%	
Sand	Coarse	2.00 mm	0.60 mm	2%	
	Medium	0.60 mm	0.20 mm	3%	7%
	Fine	0.20 mm	0.06 mm	2%	
SILT and CLAY		<0.06 mm		4%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP108
Depth:	2.2-2.9
Description:	Rhondda Member

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	89
50	63
37.5	50
20	25
10	21
6.3	19
5.0	18
2.00	15
1.18	14
0.600	12
0.425	11
0.212	8
0.150	7
0.063	6

Earthworks Materials Granular	
Group	Complies
Class 1A	✓
Class 1B	✓
Class 1C	✓
Class 6A	
Class 6B	
Class 6C	
Class 6D	
Class 6E	
Class 6F1	
Class 6F2	✓
Class 6F3*	✓
Class 6F4	
Class 6F6	
Class 6F71	✓
Class 6F72	
Class 6H	
Class 6I	
Class 6J	
Class 6K	
Class 6L	
Class 6M	✓
Class 6N	✓
Class 6P	✓

Earthworks Materials Cohesive	
Group	Complies
Class 2A	
Class 2B	
Class 2C	
Class 2D	
Class 7A	
Class 7C	
Class 7D	
Class 7E	
Class 7F	

Sub-base Materials Un-bound Granular	
Group	Complies
Type 1	
Type 2	

Aggregates Drainage Materials	
Group	Complies
Type A Filter	
Type B Filter	
40-5mm	
20-5mm	
14-5mm	

Aggregates Concrete	
Group	Complies
40mm SS	
20mm SS	
14mm SS	
10mm SS	
6mm SS	
5mm SS	
40mm All-in	
20mm All-in	
10mm All-in	
5mm All-in	
Concrete Sand	
Concrete - C	
Concrete - M	
Concrete - F	
Type A Sand	
Type B Sand	
Type S Sand	
Type G Sand	

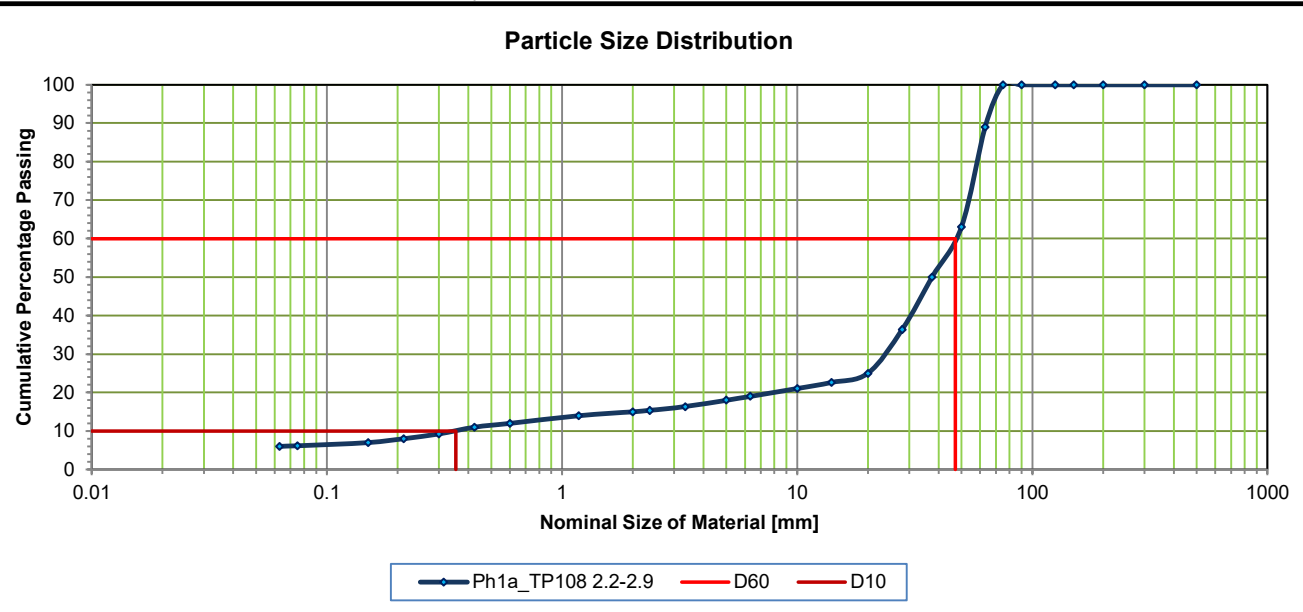
Uniformity Coefficient Calculation	
D60	47.115 mm
D10	0.354 mm
UC = D60 / D10	133.1

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		0%	
Cobbles		200 mm	60 mm	17%	
Gravel	Coarse	60 mm	20 mm	58%	
	Medium	20 mm	6.0 mm	6%	68%
	Fine	6.0 mm	2.0 mm	4%	
Sand	Coarse	2.00 mm	0.60 mm	3%	
	Medium	0.60 mm	0.20 mm	4%	9%
	Fine	0.20 mm	0.06 mm	2%	
SILT and CLAY		<0.06 mm		6%	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Material Grading Compliance	
Location:	Ph1a_TP109
Depth:	2.0-2.4
Description:	Rhondda Member

Sieve Analysis Data	
BS Sieve Size [mm]	Test Report % Passing
150	100
75	100
63	94
50	77
37.5	64
20	35
10	29
6.3	26
5.0	25
2.00	24
1.18	23
0.600	21
0.425	19
0.212	14
0.150	13
0.063	10

Earthworks Materials Granular		Earthworks Materials Cohesive		Aggregates Concrete	
Group	Complies	Group	Complies	Group	Complies
Class 1A	✓	Class 2A		40mm SS	
Class 1B	✓	Class 2B		20mm SS	
Class 1C	✓	Class 2C		14mm SS	
Class 6A		Class 2D		10mm SS	
Class 6B		Class 7A		6mm SS	
Class 6C		Class 7C		5mm SS	
Class 6D		Class 7D		40mm All-in	
Class 6E	✓	Class 7E		20mm All-in	
Class 6F1		Class 7F		10mm All-in	
Class 6F2	✓	**Sub-base Materials Un-bound Granular**		5mm All-in	
Class 6F3*	✓			Concrete Sand	
Class 6F4		Group	Complies	Concrete - C	
Class 6F6		Type 1		Concrete - M	
Class 6F71		Type 2		Concrete - F	
Class 6F72		**Aggregates Drainage Materials**		Type A Sand	
Class 6H				Type B Sand	
Class 6I	✓	Group	Complies	Type S Sand	
Class 6J	✓	Type A Filter		Type G Sand	
Class 6K		Type B Filter			
Class 6L		40-5mm			
Class 6M	✓	20-5mm			
Class 6N	✓	14-5mm			
Class 6P	✓				

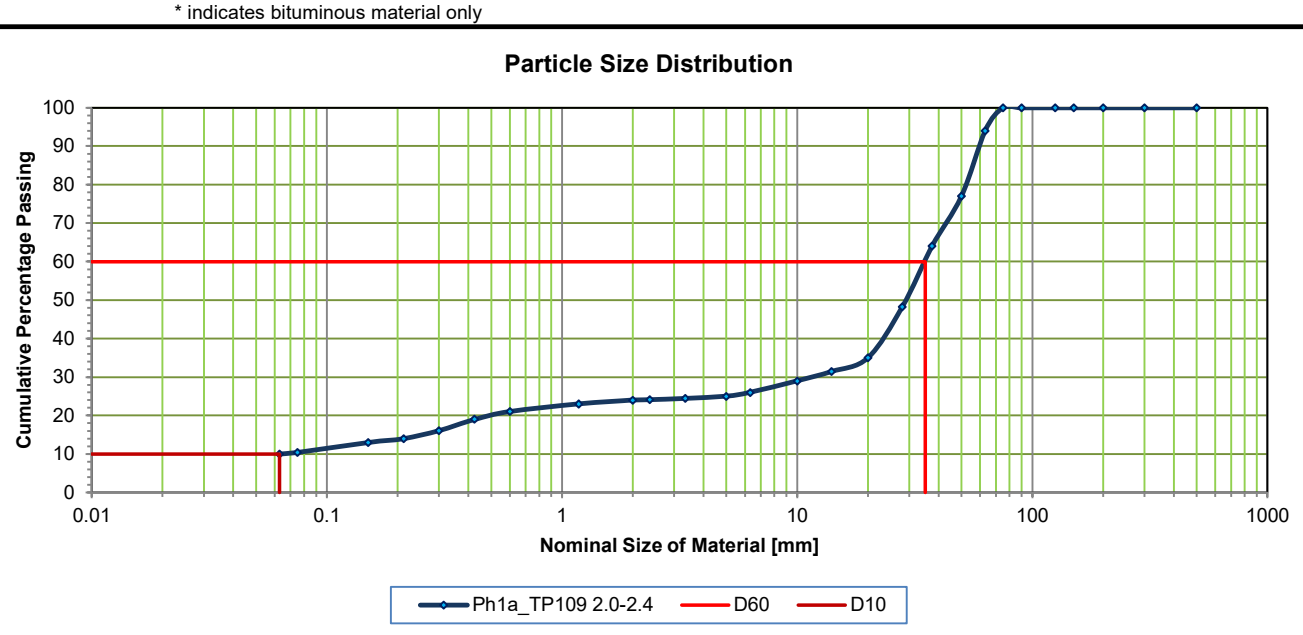
Uniformity Coefficient Calculation	
D60	35.086 mm
D10	0.063 mm
UC = D60 / D10	556.9

Proportion of Constituent Material Sizes

Descriptive Term		Nominal Size Maximum	Nominal Size Minimum	Percentage of Material	
Boulder		>200 mm		**0%**	
Cobbles		200 mm	60 mm	**10%**	
Gravel	Coarse	60 mm	20 mm	55%	
	Medium	20 mm	6.0 mm	9%	**66%**
	Fine	6.0 mm	2.0 mm	2%	
Sand	Coarse	2.00 mm	0.60 mm	3%	
	Medium	0.60 mm	0.20 mm	7%	**14%**
	Fine	0.20 mm	0.06 mm	4%	
SILT and CLAY		<0.06 mm		**10%**	

Comments: Uniformity Coefficient should be compared against SHW Table 6/1 for specific class requirements

* indicates bituminous material only



Hydrock

Client	Location or material to which this assessment applies
Trivallis	Made Ground
Project	
Phase 1a Penrhys Village	
Job number	
30603	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	6	2	
No. tests in 20% data set	1	0	
No. tests with suspected pyrite		0	
Maximum value	356	0.6	
Mean of highest two values	309	1	
Mean of highest 20%			
Characteristic Value	**309**	**0.6**	
			Mg not required

	[no pyrite]	[pyrite suspected]
DS Class	**DS-1**	**DS-2**

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

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

Water data

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

DS Class

pH data

	Soil	Water
Number of tests	8	0
No. tests in 20% data set	2	
Lowest pH	8.2	
Mean of lowest 20%	8.4	
Characteristic value	**8.4**	
Design value	**8.4**	
Number of soil pH results less than 5.5	0	

DS Class design value

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

ACEC Class design value

Brownfield Static groundwater **AC-1s**

Hydrock

Client	Location or material to which this assessment applies
Trivallis	Rhondda Member
Project	
Phase 1a Penrhys Village	
Job number	
30603	

Concrete in aggressive ground

After BRE Special Digest 1:2005 + 2017 3e

Soil data

	(Adjusted) water soluble sulfate (mg/l)	Total potential sulfate (%)	Water soluble magnesium (mg/l)
Number of tests	5	5	
No. tests in 20% data set	1	1	
No. tests with suspected pyrite		0	
Maximum value	117	0.1	
Mean of highest two values	108	0	
Mean of highest 20%			
Characteristic Value	**108**	**0**	

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

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

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

Water data

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

DS Class

pH data

	Soil	Water
Number of tests	5	0
No. tests in 20% data set	1	
Lowest pH	7.3	
Mean of lowest 20%	7.3	
Characteristic value	**7.3**	
Design value	**7.3**	
Number of soil pH results less than 5.5	0	

DS Class design value

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

ACEC Class design value

Natural ground

Static groundwater **AC-1s**

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

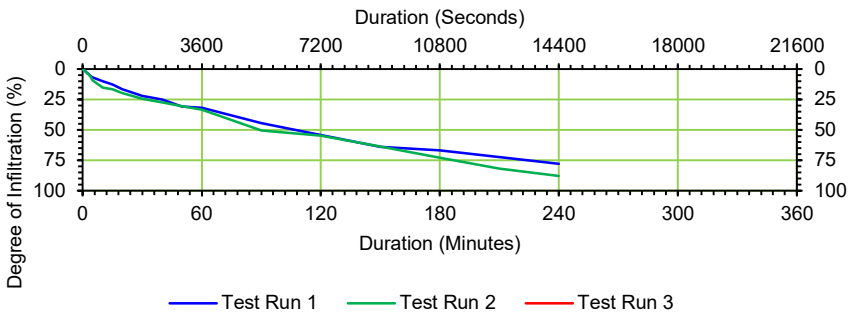
Site: Penrhys Phase 1a
Client: Trivallis
Test Location TP103 **Date of start** 19/02/2025 **Date at end** 19/02/2025

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.100m	Trial Pit Length (L)	2.100m	Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.800m	Trial Pit Breadth / Width (B)	0.800m	Trial Pit Breadth / Width (B)	
Effective Depth (D)	1.900m	Effective Depth (D)	1.800m	Effective Depth (D)	
Time at Start of Filling	9.25	Time at Start of Filling	14.10	Time at Start of Filling	
Time at End of Filling	9.38	Time at End of Filling	14.15	Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.180m	Depth below Surface to Water (D_{TW})	1.140m	Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.720m	Water Depth (W_D)	0.660m	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.210m³	Maximum Fill Volume (V_W)	1.109m³	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	100.000	Porosity of Gravel Backfill (P_t)	100.000	Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.210m³	Corrected Water Volume (V_{WC})	1.109m³	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	9.380	1.180	0	1	14.150	1.140	0				
1	9.390	1.190	60	1	14.160	1.150	60				
1	9.400	1.200	120	1	14.170	1.160	120				
1	9.410	1.210	180	1	14.180	1.170	180				
1	9.420	1.220	240	1	14.190	1.180	240				
1	9.430	1.230	300	1	14.200	1.200	300				
1	9.480	1.250	600	1	14.250	1.240	600				
1	9.530	1.270	900	1	14.300	1.250	900				
1	9.580	1.300	1200	1	14.350	1.270	1200				
1	10.080	1.340	1800	1	14.450	1.300	1800				
1	10.180	1.360	2400	1	14.550	1.320	2400				
1	10.280	1.400	3000	1	15.050	1.340	3000				
1	10.380	1.410	3600	1	15.150	1.360	3600				
1	11.080	1.500	5400	1	15.450	1.473	5400				
1	11.380	1.570	7200	1	16.150	1.500	7200				
1	12.080	1.640	9000	1	16.450	1.560	9000				
1	12.380	1.660	10800	1	17.150	1.620	10800				
1	13.080	1.700	12600	1	17.450	1.680	12600				
1	13.380	1.740	14400	1	18.150	1.720	14400				
			14400				14400				
			14400				14400				
			14400				14400				
			14400				14400				

25% water loss (75% full)	1.360m	**25% water loss (75% full)**	1.305m	**25% water loss (75% full)**	-
50% water loss (50% full)	1.540m	**50% water loss (50% full)**	1.470m	**50% water loss (50% full)**	-
75% water loss (25% full)	1.720m	**75% water loss (25% full)**	1.635m	**75% water loss (25% full)**	-
25% time (seconds)	2200 sec	**25% time (seconds)**	1950 sec	**25% time (seconds)**	-
75% time (seconds)	13500 sec	**75% time (seconds)**	11250 sec	**75% time (seconds)**	-
Vp 75-25	0.605m³	**Vp 75-25**	0.554m³	**Vp 75-25**	-
as 50 (Actual area from test)	10.612m²	**as 50 (Actual area from test)**	10.206m²	**as 50 (Actual area from test)**	-
tp 75 - 25	11300 sec	**tp 75 - 25**	9300 sec	**tp 75 - 25**	
Soil Infiltration Rate	**5.04E-06m/s**	**Soil Infiltration Rate**	**5.84E-06m/s**	**Soil Infiltration Rate**	-



Form completed by		
Tested By	PRINT	EMILY FRANKISH
	SIGN	
	DATE	19.02.25
Calculated By	PRINT	EMILY FRANKISH
	SIGN	
	DATE	06.03.25
Checked by	PRINT	KURT GILMORE
	SIGN	
	DATE	31.03.25

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

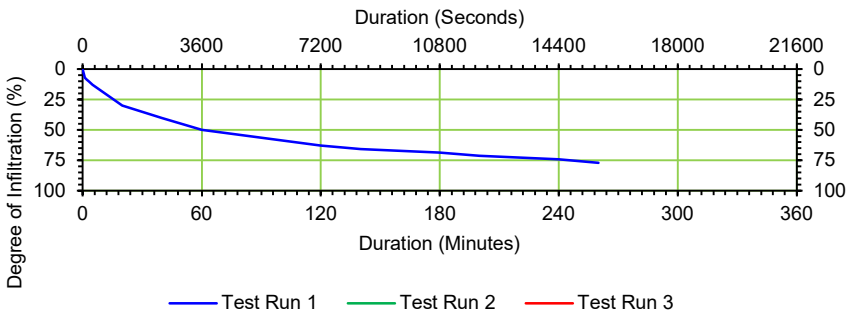
Site: Penrhys Phase 1a
Client: Trivallis
Test Location TP109 **Date of start** 19/02/2025 **Date at end** 19/02/2025

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.300m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.400m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	11.40	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	11.47	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.700m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.700m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.127m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.127m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	11.470	1.700	0								
1	11.480	1.750	60								
1	11.490	1.760	120								
1	11.500	1.770	180								
1	11.520	1.790	300								
1	12.070	1.910	1200								
1	12.270	1.980	2400								
1	12.470	2.050	3600								
1	13.470	2.140	7200								
1	14.070	2.160	8400								
1	14.470	2.180	10800								
1	15.070	2.200	12000								
1	15.470	2.220	14400								
1	16.070	2.240	15600								
			15600								
			15600								
			15600								
			15600								
			15600								
			15600								
			15600								
			15600								
			15600								
			15600								

25% water loss (75% full)			1.875m	**25% water loss (75% full)**			-	**25% water loss (75% full)**			-
50% water loss (50% full)			2.050m	**50% water loss (50% full)**			-	**50% water loss (50% full)**			-
75% water loss (25% full)			2.225m	**75% water loss (25% full)**			-	**75% water loss (25% full)**			-
25% time (seconds)			937 sec	**25% time (seconds)**			-	**25% time (seconds)**			-
75% time (seconds)			14700 sec	**75% time (seconds)**			-	**75% time (seconds)**			-
Vp 75-25			0.564m³	**Vp 75-25**			-	**Vp 75-25**			-
as 50 (Actual area from test)			13.910m²	**as 50 (Actual area from test)**			-	**as 50 (Actual area from test)**			-
tp 75 - 25			13763 sec	**tp 75 - 25**				**tp 75 - 25**			
Soil Infiltration Rate		**2.94E-06m/s**		**Soil Infiltration Rate**		-		**Soil Infiltration Rate**		-	



Form completed by		
Tested By	PRINT	Emily Frankish
	SIGN	
	DATE	19.02.25
Calculated By	PRINT	Emily Frankish
	SIGN	
	DATE	06.03.25
Checked by	PRINT	Kurt Gilmore
	SIGN	
	DATE	31.03.25

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

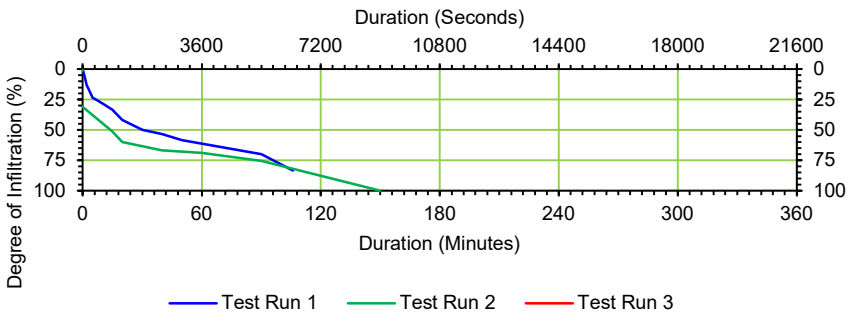
Site: Penrhys Phase 1a
Client: Trivallis
Test Location TP111 **Date of start** 19/02/2025 **Date at end** 19/02/2025

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.500m	Trial Pit Length (L)	2.100m	Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.800m	Trial Pit Breadth / Width (B)	0.800m	Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.400m	Effective Depth (D)	2.100m	Effective Depth (D)	
Time at Start of Filling	10.15	Time at Start of Filling	12.08	Time at Start of Filling	
Time at End of Filling	10.22	Time at End of Filling	12.08	Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.800m	Depth below Surface to Water (D_{TW})	1.650m	Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.600m	Water Depth (W_D)	0.450m	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.200m³	Maximum Fill Volume (V_W)	0.756m³	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.200m³	Corrected Water Volume (V_{WC})	0.756m³	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	10.220	1.800	0	1	12.080	1.650	0				
1	10.230	1.840	60	1	12.013	1.750	-402				
1	10.240	1.880	120	1	12.230	1.880	900				
1	10.250	1.900	180	1	12.280	1.920	1200				
1	10.260	1.920	240	1	12.480	1.950	2400				
1	10.270	1.940	300	1	13.080	1.960	3600				
1	10.320	1.970	600	1	13.380	1.990	5400				
1	10.370	2.000	900	1	14.380	2.100	9000				
1	10.420	2.050	1200				9000				
1	10.520	2.100	1800				9000				
1	11.020	2.120	2400				9000				
1	11.120	2.150	3000				9000				
1	11.520	2.220	5400				9000				
1	12.080	2.300	6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				
			6360				9000				

25% water loss (75% full)	1.950m	**25% water loss (75% full)**	1.763m	**25% water loss (75% full)**	-
50% water loss (50% full)	2.100m	**50% water loss (50% full)**	1.875m	**50% water loss (50% full)**	-
75% water loss (25% full)	2.250m	**75% water loss (25% full)**	1.988m	**75% water loss (25% full)**	-
25% time (seconds)	400 sec	**25% time (seconds)**	-277 sec	**25% time (seconds)**	-
75% time (seconds)	5760 sec	**75% time (seconds)**	5250 sec	**75% time (seconds)**	-
Vp 75-25	0.600m³	**Vp 75-25**	0.378m³	**Vp 75-25**	-
as 50 (Actual area from test)	15.860m²	**as 50 (Actual area from test)**	12.555m²	**as 50 (Actual area from test)**	-
tp 75 - 25	5360 sec	**tp 75 - 25**	5527 sec	**tp 75 - 25**	
Soil Infiltration Rate	**7.06E-06m/s**	**Soil Infiltration Rate**	**5.45E-06m/s**	**Soil Infiltration Rate**	-



Form completed by		
Tested By	PRINT	Emily Frankish
	SIGN	
	DATE	19.02.25
Calculated By	PRINT	Emily Frankish
	SIGN	
	DATE	06.03.25
Checked by	PRINT	Kurt Gilmore
	SIGN	
	DATE	31.03.25

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	26/02/2025

Test Results:

Sample Description: MADE GROUND: Slightly sandy slightly gravelly silty CLAY. Gravel of sandstone and inclusions of brick and concrete.

Test Location: TP101

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	80	80
Layer 2	3	3	4	170	250
Layer 3	14	17	53	73	323
Layer 4	21	38	>100	17	340

Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Obstruction encountered at 340mm depth.

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	28/02/2025

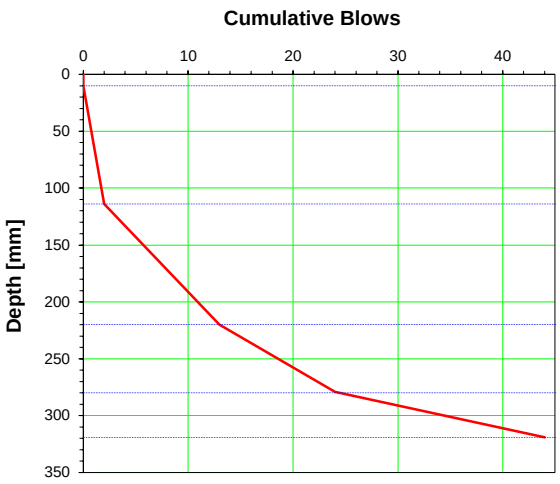
Test Results:

Sample Description: MADE GROUND: Slightly gravelly sandy CLAY. With abundant brick, concrete, breezeblock and timber below 0.2m.

Test Location: TP102

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	10	10
Layer 2	1	1	2	104	114
Layer 3	12	13	30	106	220
Layer 4	10	23	45	60	280
Layer 5	21	44	>100	39	319



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$
Obstruction encountered at 370mm depth.

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	28/02/2025

Test Results:

Sample Description: MADE GROUND: Clayey slightly gravelly fine to coarse SAND with fragments of concrete.

Test Location: TP103

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	129	129
Layer 2	2	2	6	84	213
Layer 3	7	9	24	77	290
Layer 4	6	15	15	105	395
Layer 5	8	23	21	98	493
Layer 6	5	28	20	66	559
Layer 7	2	30	10	51	610
Layer 8	2	32	9	55	665

Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	28/02/2025

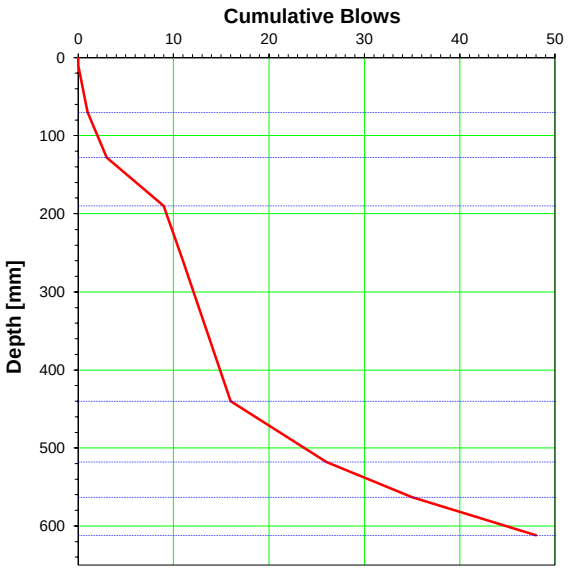
Test Results:

Sample Description: MADE GROUND: Slightly gravelly clayey fine to coarse SAND with occasional fragments of concrete and brick.

Test Location: TP104A

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	1	1	3	70	70
Layer 2	1	2	4	58	128
Layer 3	7	9	30	62	190
Layer 4	6	15	6	250	440
Layer 5	9	24	31	78	518
Layer 6	9	33	55	45	563
Layer 7	15	48	86	49	612



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Form Number: HD-TRL-DCP ver1

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	28/02/2025

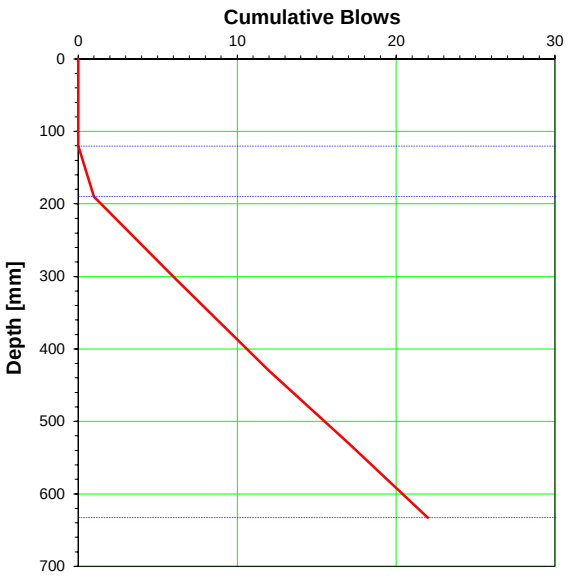
Test Results:

Sample Description: MADE GROUND: Sandy silty gravelly CLAY with fragments of brick, concrete, breezeblock, blacktop and polystyrene.

Test Location: TP105

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	120	120
Layer 2	2	2	7	70	190
Layer 3	20	22	11	443	633



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	26/02/2025

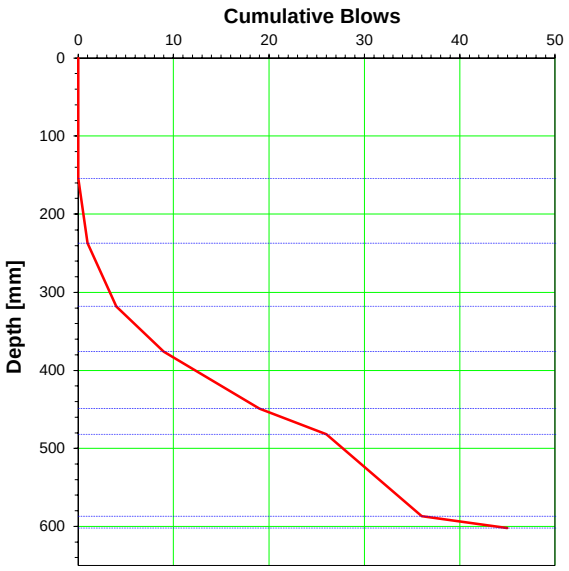
Test Results:

Sample Description: MADE GROUND: Sandy slightly gravelly silty CLAY with brick and concrete fragments.

Test Location: TP106

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	154	154
Layer 2	1	1	3	83	237
Layer 3	3	4	9	81	318
Layer 4	5	9	23	58	376
Layer 5	10	19	37	73	449
Layer 6	7	26	59	33	482
Layer 7	9	35	23	105	587
Layer 8	10	45	>100	15	602



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	26/02/2025

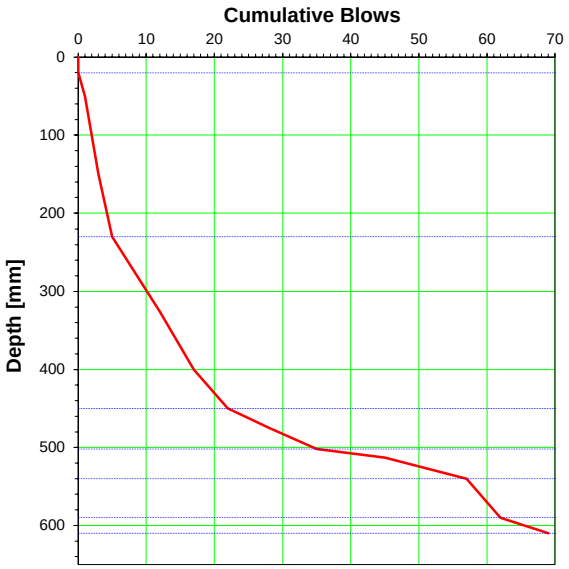
Test Results:

Sample Description: MADE GROUND: Slightly gravelly sandy silty CLAY with fragments of brick and concrete.

Test Location: TP107

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	20	20
Layer 2	5	5	6	210	230
Layer 3	17	22	20	220	450
Layer 4	13	35	70	52	502
Layer 5	22	57	>100	38	540
Layer 6	5	62	26	50	590
Layer 7	7	69	100	20	610



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	27/02/2025

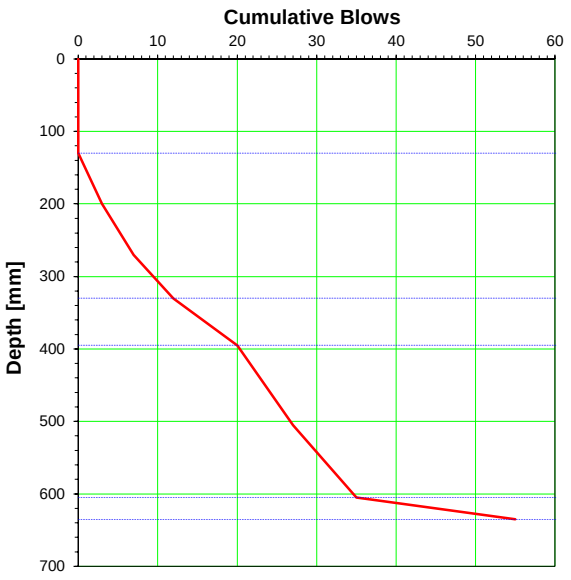
Test Results:

Sample Description: MADE GROUND: Slightly sandy slightly gravelly silty CLAY with fragments of concrete, brick and timber.

Test Location: TP108

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	130	130
Layer 2	12	12	15	200	330
Layer 3	8	20	33	65	395
Layer 4	15	35	19	210	605
Layer 5	20	55	>100	30	635



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hard obstruction at 605mm to 635mm depth.

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	27/02/2025

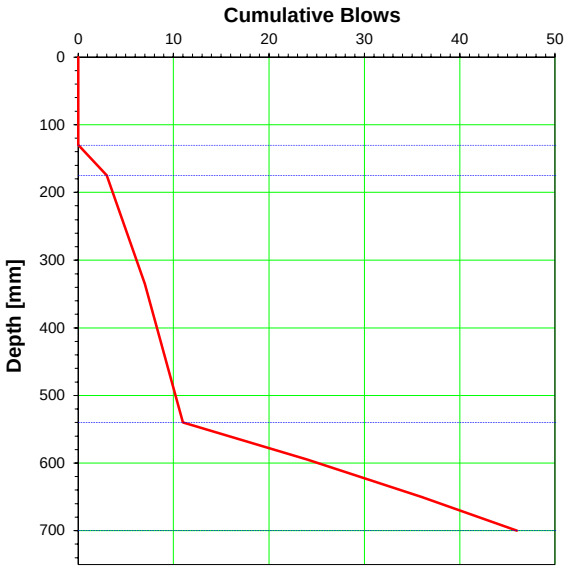
Test Results:

Sample Description: MADE GROUND: Slightly gravelly sandy silty CLAY with fragments of brick, concrete and timber.

Test Location: TP109

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	130	130
Layer 2	3	3	17	45	175
Layer 3	8	11	5	365	540
Layer 4	35	46	61	160	700



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	27/02/2025

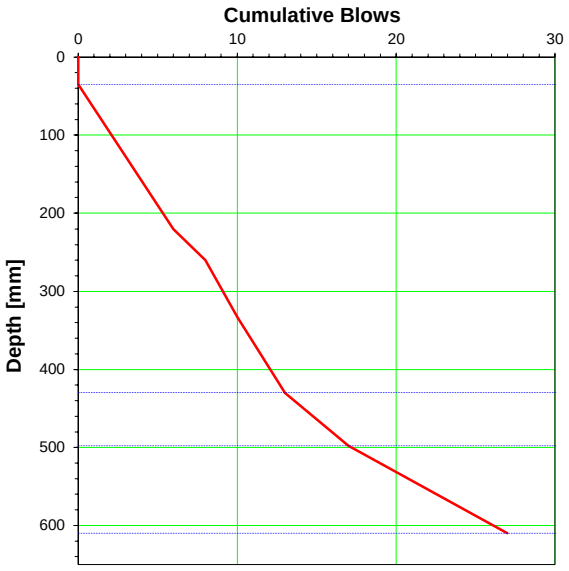
Test Results:

Sample Description: MADE GROUND: Slightly gravelly sandy silty CLAY with fragments of concrete, brick, timber and glass.

Test Location: TP110

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	35	35
Layer 2	13	13	8	395	430
Layer 3	4	17	15	68	498
Layer 4	10	27	23	112	610



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	27/02/2025

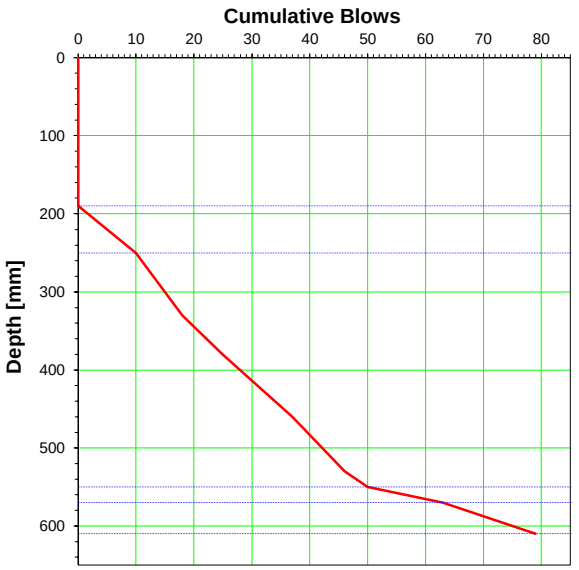
Test Results:

Sample Description: MADE GROUND: Sandy silty CLAY with fragments of brick, blacktop and glass.

Test Location: TP111

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	190	190
Layer 2	10	10	45	60	250
Layer 3	40	50	36	300	550
Layer 4	13	63	>100	20	570
Layer 5	16	79	>100	40	610



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$

Hydrock now Stantec

TEST CERTIFICATE

Determination of TRL Dynamic Cone Penetrometer

Tested in accordance with In TRL Road Note 31 & 8 and IAN 73/06 (2009 amendment)

Client:	Trivallis	**Job Number:**	30603
Site Name:	Penrhys Phase 1a	**Date Tested:**	26/02/2025

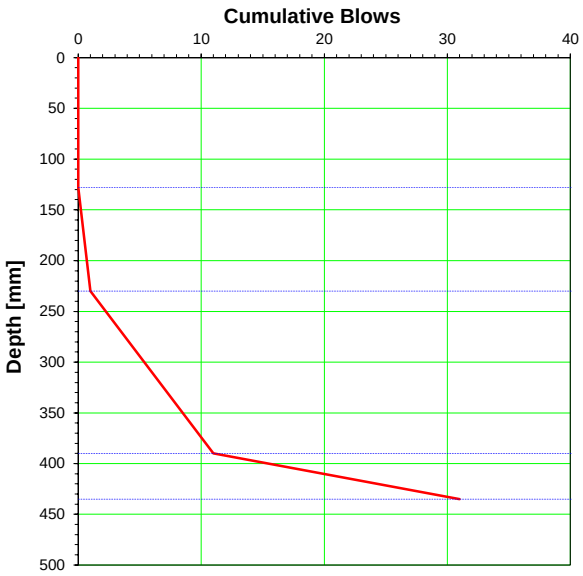
Test Results:

Sample Description: MADE GROUND: Gravelly clayey fine to coarse sand with abundant fragments of concrete and rare brick.

Test Location: TP113

Start Depth [mm]: 0

Layer	No of Blows	Cumulative Blows	CBR [%]	Layer Thickness [mm]	Total Depth [mm]
Layer 1	0	0	0	128	128
Layer 2	1	1	2	102	230
Layer 3	10	11	16	160	390
Layer 4	20	31	>100	45	435



Comments: TRL Equation : $Log_{10}(CBR) = 2.480 - 1.057 \times Log_{10}(Strength)$
With hard obstruction at 435mm depth.

Appendix E Site monitoring data

Site monitoring data

Ground Gas Monitoring Form

Hydrock

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**06/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH301	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	0.07	0.0	0.0	0.2	20.8			
0:00:30	-	0.0	0.0	0.1	20.2			
0:01:00	-	0.0	0.0	0.1	20.2			
0:02:00	-	0.0	0.0	0.1	20.2			
0:03:00	-	0.0	0.0	0.1	20.2			
0:04:00	-		0.0	0.1	20.2			
0:05:00	-							
0:06:00	-							
0:07:00	-							
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	969	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling 10 hPa in 24hrs		0.1	0.1	21.9			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	Dry
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.43
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Ground Gas Monitoring Form

Hydrock

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**06/03/2025**	**Weather:**	Dry and sunny
Comments:	**Well flooded - data unsuitable.**	**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH201	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	0.50
Well Material:	uPVC	**Base of Screen (m bgl):**	1.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	112.05	28.9	0.0	0.2	20.3			
0:00:30	-	21.7	0.8	0.2	10.5			
0:01:00	-	11.1	0.9	0.3	9.5			
0:02:00	-	3.7	1.1	0.4	7.7			
0:03:00	-	1.5	No further monitoring possible as water pumped into tubing					
0:04:00	-	0.7						
0:05:00	-	0.6						
0:06:00	-	0.4						
0:07:00	-	0.3						
0:08:00	-	0.2						
0:09:00	-	0.1						
0:10:00	-	0.0						

Ambient readings

Atmospheric pressure (mb):	972	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling 10 hPa in 24hrs		0.1	0.1	21.9			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	0.27
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	0.96
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Ground Gas Monitoring Form

Hydrock

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**06/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH202	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-1.01	0.1	0.0	0.2	20.2			
0:00:30	-	0.0	0.0	0.1	17.1			
0:01:00	-	-0.1	0.0	0.1	17.1			
0:02:00	-	-0.1	0.0	0.1	16.9			
0:03:00	-	-0.1	0.0	0.1	16.9			
0:04:00	-	-0.1	0.0	0.1	16.9			
0:05:00	-	-0.1	0.0	0.1	17.0			
0:06:00	-	-0.1	0.0	0.1	17.1			
0:07:00	-		0.0	0.1	17.2			
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	969	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling 10 hPa in 24hrs		0.0	0.0	21.5			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datur `	Ground Level	**Water Level Depth (m bd):**	1.65
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.04
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**12/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH301	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-0.51	0.0	0.0	0.2	21.0			
0:00:30	-	0.0	0.0	0.1	20.1			
0:01:00	-	0.0	0.0	0.1	20.1			
0:02:00	-	0.0	0.0	0.1	20.1			
0:03:00	-	0.0	0.0	0.1	20.1			
0:04:00	-		0.0	0.1	20.1			
0:05:00	-							
0:06:00	-							
0:07:00	-							
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	968 (S)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling c. 5mb in 24hrs		0.0	0.2	21.0			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	Dry
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.43
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**12/03/2025**	**Weather:**	Dry and sunny
Comments:	**Well purged prior to gas monitoring.**	**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH201	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	0.50
Well Material:	uPVC	**Base of Screen (m bgl):**	1.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-0.39	0.0	0.0	0.2	21.3			
0:00:30	-	0.0	0.3	0.4	19.4			
0:01:00	-	0.0	0.3	0.4	19.2			
0:02:00	-	0.0	0.4	0.5	18.8			
0:03:00	-	0.0	0.4	0.5	18.1			
0:04:00	-		No further monitoring possible - pump failure.					
0:05:00	-							
0:06:00	-							
0:07:00	-							
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	972 (S)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling 10 hPa in 24hrs		0.1	0.1	21.9			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	0.70
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	0.93
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**12/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH202	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	0.62	0.0	0.0	0.2	20.9			
0:00:30	-	0.0	0.0	0.1	19.2			
0:01:00	-	0.0	0.0	0.1	19.1			
0:02:00	-	0.0	0.0	0.1	19.1			
0:03:00	-	0.0	0.0	0.1	19.1			
0:04:00	-		0.0	0.1	19.1			
0:05:00	-							
0:06:00	-							
0:07:00	-							
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	970 (S)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Falling 10 hPa in 24hrs		0.0	0.2	21.0			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datur `	Ground Level	**Water Level Depth (m bd):**	1.65
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.04
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**19/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH301	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-0.1	0.0	0.0	0.2	20.7			
0:00:30	-	0.0	0.0	0.0	20.3			
0:01:00	-	0.0	0.0	0.1	20.1			
0:02:00	-	0.0	0.0	0.1	20.1			
0:03:00	-	0.0	0.0	0.1	20.1			
0:04:00	-		0.0	0.1	20.1			
0:05:00	-							
0:06:00	-							
0:07:00	-							
0:08:00	-							
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	977 (F)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Fall in pressure of c. 5mb over 24 hours.		0.0	0.2	20.9			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	Dry
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.43
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**19/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH201	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	0.50
Well Material:	uPVC	**Base of Screen (m bgl):**	1.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-167.6	0.0	0.0	0.1	20.4			
0:00:30	-	0.0	0.7	0.5	14.6			
0:01:00	-	-25.6	0.8	0.5	13.8			
0:02:00	-	-15.7	0.9	0.6	12.6			
0:03:00	-	-8.0	1.0	0.6	12.2			
0:04:00	-	-3.0	No further monitoring possible - pump failure.					
0:05:00	-	-1.4						
0:06:00	-	-0.7						
0:07:00	-	-0.5						
0:08:00	-	-0.4						
0:09:00	-	-0.3						
0:10:00	-	-0.4						

Ambient readings

Atmospheric pressure (mb):	981 (F)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Fall in pressure of c. 5mb over 24 hours.		0.0	0.1	20.0			

Observations during monitoring

No further bulk gas monitoring possible after 4 minutes due to pump failure. Concluded to be due to water in standpipe creating a vacuum and stressing pump. On removal of tubing from gas tap, an audible hiss was observed as standpipe pressure normalised.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	0.65
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	0.96
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Hydrock

Ground Gas Monitoring Form

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Visit Details			
Date:	**19/03/2025**	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Well Details			
Well ID:	BH202	**Casing Level above GL (m):**	0.00
Single or dual gas tap:	Single	**Top of Screen (m bgl):**	1.00
Well Material:	uPVC	**Base of Screen (m bgl):**	2.00
Well Diameter D (mm):	50	**Top of Screen (m b.casing):**	-
Hole Diameter R (mm):	100	**Base of Screen (m b.casing):**	-
Expected headspace air volume:			
Equipment Details			
Gas Analyser Type:	GA 5000	**Instrument Serial Number:**	G504584
Calibration Date:	18/07/2025	**Span gas check ok:**	OK
PID instrument:	**-**	**Instrument Serial Number:**	-
Calibration Date:	**-**	**Calibration check ok:**	-
Well conditons:			

Monitoring well in good, serviceble condition with no damage evident.

Well measurement readings

Parameter Details

Time (hh:mm:ss)	Relative BH pressure (hPA/mb)	Borehole flow (litres/hour)	CH4 (%)	CO2 (%)	O2 (%)	CO (ppm)	H2S (ppm)	VOC (ppm)
0:00:00	-0.02	0.0	0.0	0.2	20.8			
0:00:30	-	0.0	0.0	0.1	19.5			
0:01:00	-	0.0	0.0	0.1	19.4			
0:02:00	-	-0.1	0.0	0.1	19.3			
0:03:00	-	-0.1	0.0	0.1	19.3			
0:04:00	-	0.0	0.0	0.1	19.2			
0:05:00	-	0.0	0.0	0.1	19.1			
0:06:00	-	0.0	0.0	0.1	19.1			
0:07:00	-	0.0	0.0	0.1	19.1			
0:08:00	-		0.0	0.1	19.1			
0:09:00	-							
0:10:00	-							

Ambient readings

Atmospheric pressure (mb):	970 (F)	Ambient concentrations:					
Pressure trends in previous 24 hrs:		**CH4**	**CO2**	**O2**	**CO**	**H2S**	**VOC**
Fall in pressure of c. 5mb over 24 hours.		0.0	0.2	21.0			

Observations during monitoring

None.

Groundwater Gauging:

Monitoring Data

Monitoring Datum:	Ground Level	**Water Level Depth (m bd):**	1.72
Depth to NAPL (m bd):	None	**Measured Well Depth (m bd):**	2.07
NAPL Thickness (mm):	None	**Correction for dip tape depth to base (mm):**	20

Groundwater Gauging Form

Hydrock

Project Details			
Project Name:	Penrhys Phase 1a	**Project Number:**	30603
Well Details			
Well ID:	BH203	**Top of Screen (m bgl):**	5.00
Well Type:	Standpipe	**Base of Screen (m bgl):**	8.00
Well Condition:	Serviceable	**Top of Screen (m b.casing):**	5.25
Casing Level above GL (m):	0.25	**Base of Screen (m b.casing):**	8.25
Equipment Details			
Interface/Dip Meter ID:	Interface meter 8227417	**Calibration/Check Date:**	n/a

Visit Details			
Date:	06/03/2025	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Groundwater Gauging			
Monitoring Data			
Monitoring Datum:	☑ Casing	☐ Ground Level	
Depth to NAPL (m bd):	Not encountered	**Water Level Depth (m bd):**	Dry
NAPL Thickness (mm):	n/a	**Measured Well Depth (m bd):**	8.25
Correction for dip tape depth to base (mm):	20		

Visit Details			
Date:	12/03/2025	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Groundwater Gauging			
Monitoring Data			
Monitoring Datum:	☑ Casing	☐ Ground Level	
Depth to NAPL (m bd):	Not encountered	**Water Level Depth (m bd):**	Dry
NAPL Thickness (mm):	n/a	**Measured Well Depth (m bd):**	8.26
Correction for dip tape depth to base (mm):	20		

Visit Details			
Date:	19/03/2025	**Weather:**	Dry and sunny
Comments:		**Recorded by:**	Emily Frankish
Groundwater Gauging			
Monitoring Data			
Monitoring Datum:	☑ Casing	☐ Ground Level	
Depth to NAPL (m bd):	Not encountered	**Water Level Depth (m bd):**	Dry
NAPL Thickness (mm):	n/a	**Measured Well Depth (m bd):**	8.25
Correction for dip tape depth to base (mm):	20		

Ground gas risk classification

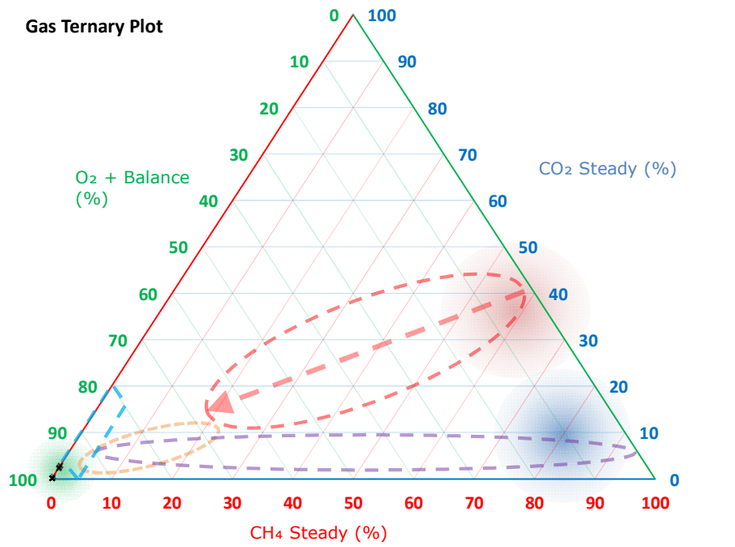
Hydrock Bulk Gases Ternary Plot Analysis

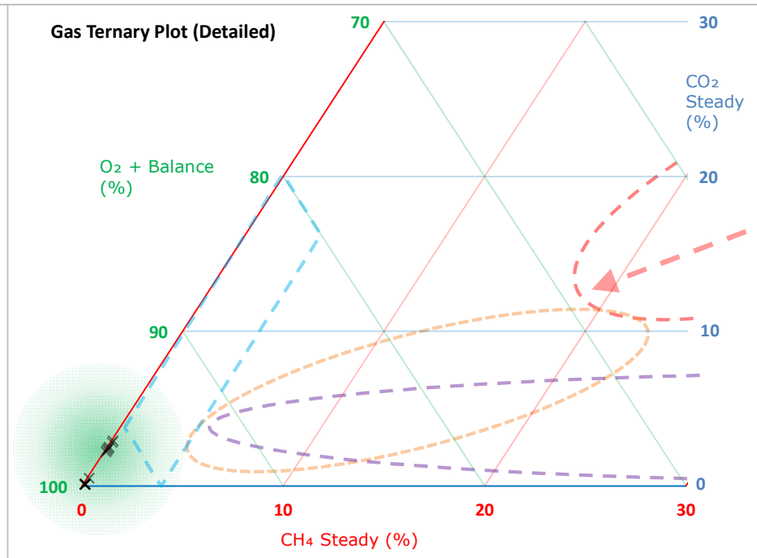
Client:	Trivallis
Site Name:	Phase 1a Penrhys Village
Contract Number:	C-30603
Assessment Date:	01/04/2025

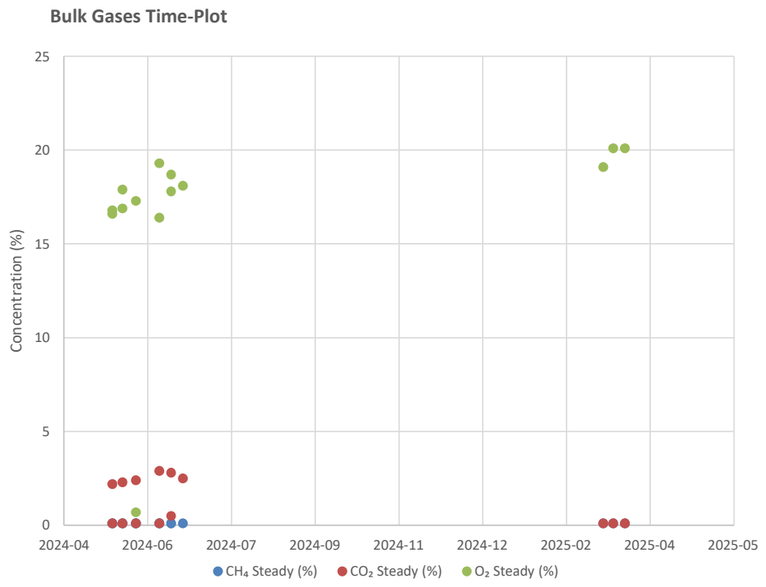
Screened Strata:	Made Ground
Site Zone:	Whole site

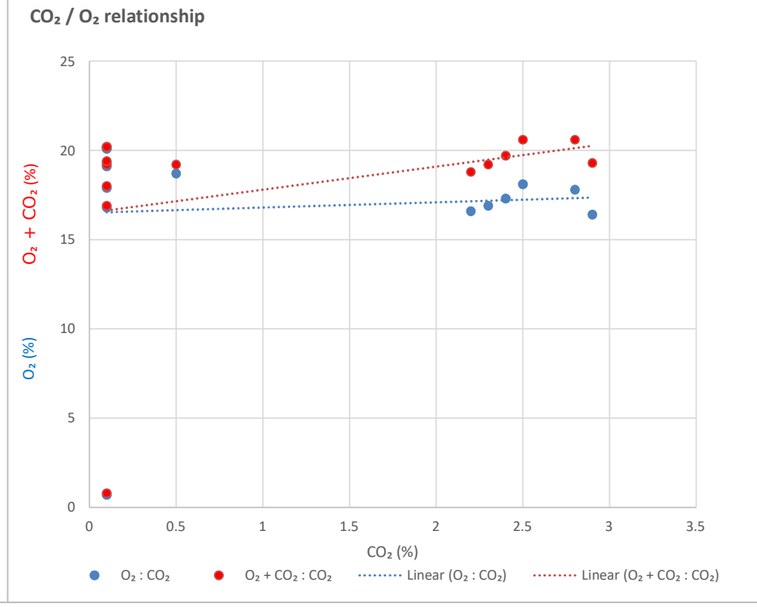
Locations

BH_Ph1a_202 | BH301 | BH302B | (blank)









Key:

	Indicative of landfill gas migration (assuming source composition 60% methane / 40% carbon dioxide) as it displaces air from the ground. Assumes no chemical changes. Below 20% methane and 13% carbon dioxide relationship for landfill gas migration unclear. Arrow shows direction of dilution with fresh air
	Microbial respiration of organic material in soil. Zero methane and low flow. (Direct consumption of oxygen to produce carbon dioxide)
	Potentially indicative of methane outgassing from groundwater to borehole headspace (Hydrock dataset).
	Potentially indicative of microbial degradation of LNAPL vapours in unsaturated zone. (Hydrock dataset)
	Indicative of a landfill gas source (e.g 60% CH_4 / 40% CO_2)
	Indicative of geogenic gas (e.g mine-workings)
	Fresh air

Additional Notes

A direct linear downwards relationship between CO_2 and O_2 indicates depletion of oxygen to produce carbon dioxide via microbial respiration using the following equation: $CH_2O + O_2 \rightarrow CO_2 + H_2O$ In this scenerio $CO_2 + O_2$ should be around 21% (i.e. the O_2 concentration in the atmosphere)

There may also be trace amounts of methane up to about 3% caused by anaerobic decomposition in small anaerobic hotspots or the reduction of carbon dioxide by methanogens. Oxygen concentrations may be depleted but in this scenario oxygen deficient air is not likely to be emitted quickly from the ground and it does not pose a risk.

After: Wilson et al, 2018. Ground Gas Information Sheet No. 1
Hydrock datasets (methane outgassing / LNAPL vapour degradation)

Version: 1 09/07/2019

Hydrock

Site: Phase 1a Penrhys Village
Job number: 30603
Client: Trivallis

Gas analyser: GA5000
Equipment check OK: Y
Service in date: Y
Calibration check OK: Y
Name of person monitoring: EF (Hydrock), GEL (2024 monitoring)

Notes on site conditions:

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

Monitoring round		Borehole details						Pressure and flow											GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipie & filter pack) (m^3)	Atmospheric pressure (hPa)	Atm pressure falling / rising / steady	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	CH_4 (%v/v)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes on condition of borehole and surrounding ground
													Steady	Absolute	Peak	Steady	Minimum	Steady				
								Max. individual values:				0.4		1.1		2.9		20.5		0.004	0.0029	
								Min. individual values:				0.1		0.1		0.1		7.7		0.0001	0.0001	Summary statistics for this monitoring period.
								Worst-case GSVs based on max. individual flow and max. individual conc. over the duration of this table:												0.0044	0.0116	
06/03/25	09:45	BH201	S	0.5	0.27		0.00053	972	R	112.05	0.0	0.1	1.1	1.1	0.4	0.2	7.7	7.7		0.0011	0.0002	Water entered tubing during monitoring - response zone flooded.
12/03/25	10:45	BH201	S	0.5	0.7		0.00173	972	S	-0.39	0.0	0.1	0.4	0.4	0.5	0.5	18.1	18.8		0.0004	0.0005	Water purged from borehole and left for 1.5 hours prior to monitoring.
19/03/25	09:15	BH201	S	0.5	0.65		0.00154	981	F	-167.60	-0.4	0.4	1	1	0.6	0.6	12.2	12.6		0.004	0.0024	Maximum recorded flow of -25.6 l/hr, falling rapidly to -0.4 l/hr considered to be representative of groundwater dropping.
06/03/25	10:15	BH202	S	1.0	1.65		0.00439	969	R	-1.01	-0.1	0.1	0	0.1	0.1	0.1	16.9	17.1		0.0001	0.0001	
12/03/25	10:00	BH202	S	1	1.65		0.00439	970	S	0.62	0.0	0.1	0	0.1	0.1	0.1	19.1	19.1		0.0001	0.0001	
19/03/25	09:45	BH202	S	1	1.72		0.00465	970	F	-0.02	0.0	0.1	0	0.1	0.1	0.1	19.1	19.1		0.0001	0.0001	
06/03/25	09:00	BH301	S	1	2.43	D	0.00730	969	F	0.07	0.0	0.1	0	0.1	0.2	0.1	20.2	20.2		0.0001	0.0001	
12/03/25	09:30	BH301	S	1	2.43	D	0.00730	968	S	-0.51	0.0	0.1	0	0.1	0.1	0.1	20.1	20.1		0.0001	0.0001	
19/03/25	10:15	BH301	S	1	2.43	D	0.00730	977	F	-0.10	0.0	0.1	0	0.1	0.1	0.1	20.1	20.1		0.0001	0.0001	
Historical monitoring:																						
17/05/24	11:50	BH301	S	1	2.5	D	0.00756	974		0.00	0.0	0.1	0	0.1	0	0.1	16.8	16.8		0.0001	0.0001	
23/05/24	11:48	BH301	S	1	2.5	D	0.00756	976		0.00	0.0	0.1	0	0.1	0.1	0.1	17.9	17.9		0.0001	0.0001	
31/05/24	10:45	BH301	S	1	2.5	D	0.00756	982		0.00	0.0	0.1	0	0.1	0.7	0.1	19.3	19.3		0.0001	0.0001	
14/06/24	11:00	BH301	S	1	2.5	D	0.00756	961		0.01	0.0	0.1	0	0.1	0	0.1	19.3	19.3		0.0001	0.0001	
21/06/24	10:03	BH301	S	1	2.5	D	0.00756	974		0.00	0.0	0.1	0	0.1	0.5	0.5	18.7	18.7		0.0001	0.0005	
28/06/24	10:44	BH301	S	1	2.5	D	0.00756	979		0.00	0.0	0.1	0	0.1	0.1	0.1	20.4	20.5		0.0001	0.0001	
17/05/24	12:15	BH302	S	2.8	9.3	D	0.02975	970		0.00	0.0	0.1	0	0.1	2.2	2.2	16.6	16.6		0.0001	0.0022	
23/05/24	12:04	BH302	S	2.8	9.3	D	0.02975	974		0.00	0.0	0.1	0	0.1	2.3	2.3	16.8	16.8		0.0001	0.0023	
31/05/24	11:11	BH302	S	2.8	9.3	D	0.02975	982		0.00	0.0	0.1	0	0.1	2.4	2.4	17.3	17.3		0.0001	0.0024	
14/06/24	11:30	BH302	S	2.8	9.3	D	0.02975	958		-0.02	-0.1	0.1	0	0.1	2.9	2.9	15.4	16.4		0.0001	0.0029	
21/06/24	10:25	BH302	S	2.8	9.3	D	0.02975	974		0.00	0.0	0.1	0	0.1	2.8	2.8	17.8	17.8		0.0001	0.0028	
28/06/24	11:10	BH302	S	2.8	9.3	D	0.02975	976		0.00	0.0	0.1	0	0.1	2.5	2.5	18	18.1		0.0001	0.0025	

Appendix F Contamination test results

Contamination test results

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Analytical Report Number : 25-008619

Replaces Analytical Report Number: 25-008619, issue no. 1
Additional analysis undertaken.
Asbestos Quantification added to sample 460527 as per client's request.

Project / Site name:	Penrhys Phase 1a	**Samples received on:**	21/02/2025
Your job number:	30603	**Samples instructed on/ Analysis started on:**	21/02/2025
Your order number:	PO39633	**Analysis completed by:**	13/03/2025
Report Issue Number:	2	**Report issued on:**	14/03/2025
Samples Analysed:	9 soil samples - 1 leachate sample		

Signed:

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460521	460522	460523	460524	460525
Sample Reference				TP113	TP103	TP105	TP105	TP104A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.05-0.15	0.30-0.50	0.60-0.90	0.90-1.20	0.00-0.10
Date Sampled				18/02/2025	18/02/2025	18/02/2025	18/02/2025	18/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	41.9	43.7	22.2	< 0.1
Moisture Content	%	0.01	NONE	29	15	14	14	28
Total mass of sample received	kg	0.1	NONE	1.3	1.3	1.4	1.4	1.3

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA	DSA
Analysis completed	N/A	N/A	N/A	26/02/2025	26/02/2025	26/02/2025	26/02/2025	26/02/2025
Actinolite detected	Type	N/A	ISO 17025	-	-	-	-	-
Amosite detected	Type	N/A	ISO 17025	-	-	-	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	-	-	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	-	-	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	-	-	-	-
Tremolite detected	Type	N/A	ISO 17025	-	-	-	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	-	-	-	-

Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	-	-	-	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	6.4	7.7	9.4	9.1	6.6
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	-	1200	-
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	0.121	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	42	44	320	200	39
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0208	0.0218	0.16	0.0991	0.0194
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	20.8	21.8	160	99.1	19.4
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	-	-	-	11	-
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	5.3	-
Total Sulphur	mg/kg	50	MCERTS	-	-	-	520	-
Total Sulphur	%	0.005	MCERTS	-	-	-	0.052	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	-	-	-	< 0.5	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-	< 0.05	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.032	0.015	0.014	0.0093	0.05
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	-	-	-	< 2.0	-
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	-	-	-	< 5.0	-

Total Phenols

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

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Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460521	460522	460523	460524	460525
Sample Reference				TP113	TP103	TP105	TP105	TP104A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.05-0.15	0.30-0.50	0.60-0.90	0.90-1.20	0.00-0.10
Date Sampled				18/02/2025	18/02/2025	18/02/2025	18/02/2025	18/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.07
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.05	< 0.05	0.09
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.18
Phenanthrene	mg/kg	0.05	MCERTS	0.22	0.09	0.61	0.1	1.5
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.17	< 0.05	0.35
Fluoranthene	mg/kg	0.05	MCERTS	0.53	0.13	1.5	0.14	4
Pyrene	mg/kg	0.05	MCERTS	0.42	0.11	1.3	0.14	3.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.27	0.08	0.78	0.08	2.5
Chrysene	mg/kg	0.05	MCERTS	0.36	0.12	0.92	0.14	2.9
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.49	0.13	0.99	0.14	4.2
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.2	< 0.05	0.43	< 0.05	1.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37	0.07	0.76	0.08	3.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.4	< 0.05	1.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	< 0.05	0.45
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.43	0.07	1.9
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.32	< 0.80	8.41	0.88	28.2
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	13	11	12	17
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.48	0.55	0.35	0.47
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.7	0.8	0.8	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	< 0.2	0.7	0.4	0.6
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	18	14	18	16	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	15	19	16	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	17	42	16	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	19	63	31	44
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	14	15	11	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	22	20	21	17	21
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	62	170	64	69
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	5	-
Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	10	-

Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460521	460522	460523	460524	460525
Sample Reference				TP113	TP103	TP105	TP105	TP104A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.05-0.15	0.30-0.50	0.60-0.90	0.90-1.20	0.00-0.10
Date Sampled				18/02/2025	18/02/2025	18/02/2025	18/02/2025	18/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPHCWG - Aliphatic >EC16 - EC35 EH_CU_1D_AL	mg/kg	10	MCERTS	-	-	18	-	-
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	18	-	-
TPHCWG - Aliphatic >EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	-	-	< 8.4	-	-
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	-	18	-	-
TPHCWG - Aliphatic >EC5 - EC44 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	-	18	-	-
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	MCERTS	-	-	< 0.010	-	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.02	MCERTS	-	-	< 0.020	-	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	< 10	-	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	30	-	-
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	-	-	31	-	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	-	30	-	-
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	-	61	-	-
TPH Total >EC5 - EC44 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-	-	79	-	-
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Benzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Toluene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	< 5.0	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	< 8.0	-	-
o-Xylene	µg/kg	5	MCERTS	-	-	< 5.0	-	-

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

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Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460526	460527	460528	460529
Sample Reference				TP102	BH203	TP107	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				1.50-1.70	0.80-1.00	0.40-0.60	1.40-1.50
Date Sampled				19/02/2025	19/02/2025	19/02/2025	19/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Stone Content	%	0.1	NONE	66.8	30.1	64.6	63.1
Moisture Content	%	0.01	NONE	8.9	18	7.6	11
Total mass of sample received	kg	0.1	NONE	1.4	1.4	1.5	1.5

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	Not-detected
Asbestos Analyst ID	N/A	N/A	N/A	DSA	DSA	DSA	DSA
Analysis completed	N/A	N/A	N/A	26/02/2025	26/02/2025	26/02/2025	26/02/2025
Actinolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Amosite detected	Type	N/A	ISO 17025	-	Detected	-	-
Anthophyllite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Chrysotile detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Crocidolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-
Tremolite detected	Type	N/A	ISO 17025	-	Not-detected	-	-

Asbestos % by hand picking/weighing	%	0.001	ISO 17025	-	< 0.001	-	-

Asbestos Containing Material Types Detected (ACM)	Type	N/A	ISO 17025	-	Loose Fibres	-	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	10.6	8	7.9	11.4
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	2300	-	-	-
Total Sulphate as SO_4	%	0.005	MCERTS	0.229	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	410	37	73	550
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.205	0.0186	0.0366	0.276
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	205	18.6	36.6	276
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	40	-	-	-
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	20	-	-	-
Total Sulphur	mg/kg	50	MCERTS	950	-	-	-
Total Sulphur	%	0.005	MCERTS	0.095	-	-	-
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	-	-	-
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	-	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0074	0.017	0.0055	0.011
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	4.6	-	-	-
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	-	-	-

Total Phenols

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

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Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460526	460527	460528	460529
Sample Reference				TP102	BH203	TP107	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				1.50-1.70	0.80-1.00	0.40-0.60	1.40-1.50
Date Sampled				19/02/2025	19/02/2025	19/02/2025	19/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	0.14
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.31	0.13	0.13	0.33
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.29	0.36	0.1	0.27
Pyrene	mg/kg	0.05	MCERTS	0.23	0.34	0.09	0.23
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.14	0.23	0.06	0.13
Chrysene	mg/kg	0.05	MCERTS	0.28	0.32	0.12	0.28
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.21	0.34	0.1	0.23
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.1	0.13	< 0.05	0.08
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.1	0.26	0.05	0.13
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.08	0.13	< 0.05	0.09
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.1	0.16	< 0.05	0.1
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	1.91	2.4	< 0.80	2.02
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.7	19	6.6	9.5
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.46	0.38	0.6	0.39
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.6	0.8	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (III)	mg/kg	1	NONE	14	14	16	15
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	16	16	15
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	16	8.6	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	26	12	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	12	12	24	9.9
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2	1.2	1.3	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	15	18	16	12
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	94	56	57	140
Magnesium (leachate equivalent)	mg/l	2.5	NONE	2.8	-	-	-
Magnesium (water soluble)	mg/kg	5	NONE	5.7	-	-	-

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Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				460526	460527	460528	460529
Sample Reference				TP102	BH203	TP107	TP110
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				1.50-1.70	0.80-1.00	0.40-0.60	1.40-1.50
Date Sampled				19/02/2025	19/02/2025	19/02/2025	19/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Petroleum Hydrocarbons							
TPHCWG - Aliphatic >EC5 - EC6 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 HS_1D_AL	mg/kg	0.01	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 EH_CU_1D_AL	mg/kg	1	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 EH_CU_1D_AL	mg/kg	2	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC16 - EC35 EH_CU_1D_AL	mg/kg	10	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 EH_CU_1D_AL	mg/kg	8	MCERTS	-	-	-	-
TPHCWG - Aliphatic >EC35 - EC44 EH_CU_1D_AL	mg/kg	8.4	NONE	-	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	-	-	-
TPHCWG - Aliphatic >EC5 - EC44 EH_CU+HS_1D_AL	mg/kg	10	NONE	-	-	-	-
TPHCWG - Aromatic >EC5 - EC7 HS_1D_AR	mg/kg	0.01	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC7 - EC8 HS_1D_AR	mg/kg	0.01	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC8 - EC10 HS_1D_AR	mg/kg	0.02	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC10 - EC12 EH_CU_1D_AR	mg/kg	1	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC12 - EC16 EH_CU_1D_AR	mg/kg	2	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC16 - EC21 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC21 - EC35 EH_CU_1D_AR	mg/kg	10	MCERTS	-	-	-	-
TPHCWG - Aromatic >EC35 - EC44 EH_CU_1D_AR	mg/kg	8.4	NONE	-	-	-	-
TPHCWG - Aromatic >EC5 - EC35 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	-	-	-
TPHCWG - Aromatic >EC5 - EC44 EH_CU+HS_1D_AR	mg/kg	10	NONE	-	-	-	-
TPH Total >EC5 - EC44 EH_CU+HS_1D_TOTAL	mg/kg	10	NONE	-	-	-	-
VOCs							
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	-	-	-	-
Benzene	µg/kg	5	MCERTS	-	-	-	-
Toluene	µg/kg	5	MCERTS	-	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	-	-	-	-
p & m-Xylene	µg/kg	8	MCERTS	-	-	-	-
o-Xylene	µg/kg	5	MCERTS	-	-	-	-

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

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Analytical Report Number: **25-008619**
Project / Site name: **Penrhys Phase 1a**
Your Order No: **PO39633**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample	Analysis completed	Analyst ID
460527	BH203	0.80-1.00	124	Loose Fibres	**Amosite**	< 0.001	**< 0.001**	13/03/2025	DSA

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

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

Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a

Your Order No: PO39633

Lab Sample Number	460522
Sample Reference	TP103
Sample Number	None Supplied
Water Matrix	N/A
Depth (m)	0.30-0.50
Date Sampled	18/02/2025
Time Taken	None Supplied

Analytical Parameter (Leachate Analysis)	Units	Test Limit of detection	Test Accreditation Status	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	8
Electrical Conductivity	µS/cm	10	ISO 17025	86
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1
Sulphate as SO_4	µg/l	45	ISO 17025	4100
Chloride	mg/l	0.15	ISO 17025	1.8
Fluoride	µg/l	50	ISO 17025	150
Ammoniacal Nitrogen as N	µg/l	15	NONE	510
Ammoniacal Nitrogen as NH_3	µg/l	15	NONE	610
Ammoniacal Nitrogen as NH_4^+	µg/l	15	NONE	650
Nitrate as N	mg/l	0.01	NONE	0.19
Nitrate as NO_3	mg/l	0.05	NONE	0.86
Nitrite as N	µg/l	1	ISO 17025	11
Nitrite as NO_2	µg/l	5	ISO 17025	37
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (monohydric) low level	µg/l	1	NONE	4
Speciated PAHs				
Naphthalene	µg/l	0.01	NONE	< 0.01
Acenaphthylene	µg/l	0.01	NONE	0.15
Acenaphthene	µg/l	0.01	NONE	0.06
Fluorene	µg/l	0.01	NONE	0.2
Phenanthrene	µg/l	0.01	NONE	0.59
Anthracene	µg/l	0.01	NONE	< 0.01
Fluoranthene	µg/l	0.01	NONE	0.15
Pyrene	µg/l	0.01	NONE	0.14
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
PAH Sums				
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.04	NONE	< 0.040
Sum of Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.02	NONE	< 0.020
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	NONE	1.29

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Analytical Report Number: 25-008619
Project / Site name: Penrhys Phase 1a

Your Order No: PO39633

Lab Sample Number				460522
Sample Reference				TP103
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.30-0.50
Date Sampled				18/02/2025
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	12	ISO 17025	210
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	2.1
Barium (dissolved)	µg/l	0.05	ISO 17025	8.9
Boron (dissolved)	µg/l	10	ISO 17025	18
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	0.7
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	2.3
Iron (dissolved)	mg/l	0.004	ISO 17025	0.24
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0
Manganese (dissolved)	µg/l	0.06	ISO 17025	5.6
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	0.6
Silver (dissolved)	µg/l	1	NONE	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Tin (dissolved)	µg/l	1	ISO 17025	< 1.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Zinc (dissolved)	µg/l	0.4	ISO 17025	< 0.4

Calcium (dissolved)	mg/l	0.012	ISO 17025	14
Sodium (dissolved)	mg/l	0.01	ISO 17025	2.2

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

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Analytical Report Number : 25-008619
Project / Site name: Penrhys Phase 1a

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
460521	TP113	None Supplied	0.05-0.15	Brown loam and clay with gravel and vegetation
460522	TP103	None Supplied	0.30-0.50	Brown loam and clay with vegetation and stones
460523	TP105	None Supplied	0.60-0.90	Brown loam and clay with vegetation and stones
460524	TP105	None Supplied	0.90-1.20	Brown loam and sand with vegetation and stones
460525	TP104A	None Supplied	0.00-0.10	Brown loam and clay with vegetation
460526	TP102	None Supplied	1.50-1.70	Brown clay and sand with stones
460527	BH203	None Supplied	0.80-1.00	Brown loam and clay with vegetation and stones
460528	TP107	None Supplied	0.40-0.60	Brown clay and loam with gravel and vegetation
460529	TP110	None Supplied	1.40-1.50	Brown clay and loam with gravel and vegetation

Analytical Report Number : 25-008619
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references	HSE Report No: 83/1996, HSG 248 (2021), HSG 264 (2012) & SCA Blue Book (draft)	A006B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
TPH Chromatogram in soil	TPH Chromatogram in soil	In-house method	L064B	D	NONE

Analytical Report Number : 25-008619
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	MCERTS
Nitrate as N in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

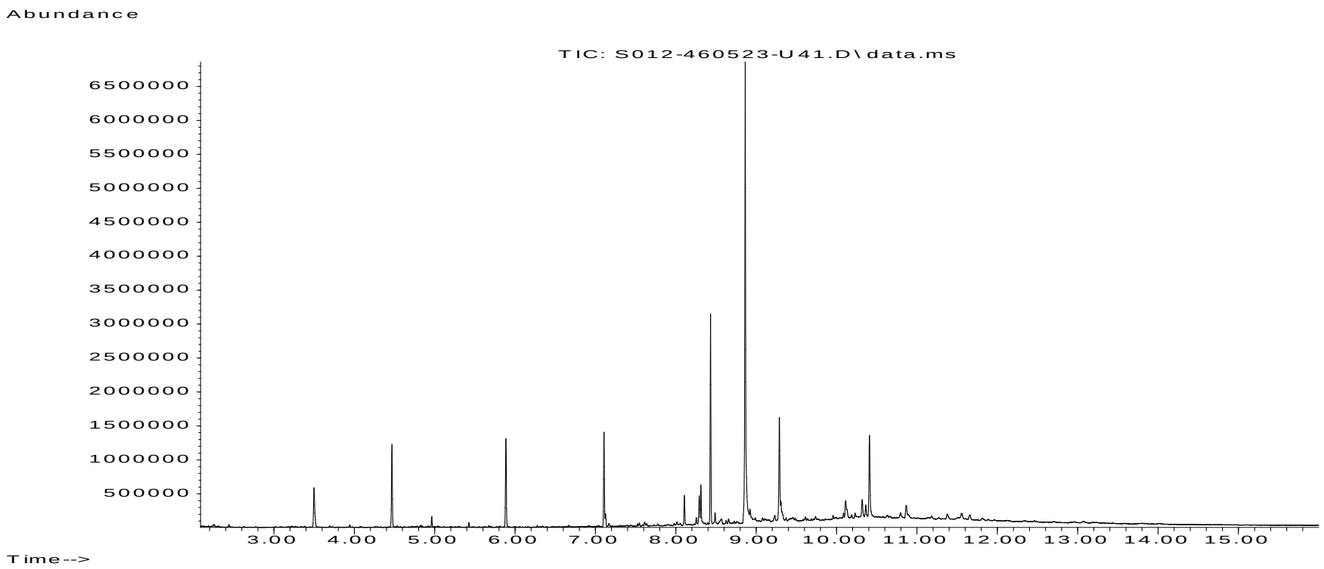
Analytical Report Number : 25-008619
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH3 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
Nitrite as N in leachate	Determination of nitrite in leachate by addition of sulphanilamide and NED followed by discrete analyser (colorimetry)	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		NONE
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution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Analytical Report Number : 25-009139

Project / Site name:	Penrhys Phase 1a	**Samples received on:**	21/02/2025
Your job number:	30603	**Samples instructed on/ Analysis started on:**	25/02/2025
Your order number:	PO39633	**Analysis completed by:**	05/03/2025
Report Issue Number:	1	**Report issued on:**	05/03/2025
Samples Analysed:	4 soil samples		

Signed:

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-009139
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				463166	463167	464443	464444
Sample Reference				TP104	TP103	TP104A	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.20-0.40	1.50-1.95	1.00-1.20	2.50-2.60
Date Sampled				18/02/2025	18/02/2025	18/02/2025	19/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Stone Content	%	0.1	NONE	30.8	54.9	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	11	14	14
Total mass of sample received	kg	0.1	NONE	1.1	1	1.2	1.2

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	-	-	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	-	-	MMI	-
Analysis completed	N/A	N/A	N/A	-	-	03/03/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	8.2	7.7	7.3	9
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1.0	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	490	390	270	710
Total Sulphate as SO_4	%	0.005	MCERTS	0.049	0.039	0.027	0.071
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	110	150	13	150
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0549	0.0744	0.0064	0.0757
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	54.9	74.4	6.4	75.7
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	13	7.1	5.1	21
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	6.7	3.6	2.6	10
Total Sulphur	mg/kg	50	MCERTS	300	150	110	280
Total Sulphur	%	0.005	MCERTS	0.03	0.015	0.011	0.028
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	0.6
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	-	-	0.015	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	11	< 2.0	< 2.0	4.7
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	5.7	< 5.0	< 5.0	< 5.0

Total Phenols

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

Analytical Report Number: 25-009139
Project / Site name: Penrhys Phase 1a
Your Order No: PO39633

Lab Sample Number				463166	463167	464443	464444
Sample Reference				TP104	TP103	TP104A	TP101
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				0.20-0.40	1.50-1.95	1.00-1.20	2.50-2.60
Date Sampled				18/02/2025	18/02/2025	18/02/2025	19/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	-	-	0.07	-
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	-	-	0.21	-
Pyrene	mg/kg	0.05	MCERTS	-	-	0.22	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	0.22	-
Chrysene	mg/kg	0.05	MCERTS	-	-	0.26	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	-	-	0.38	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	-	-	0.17	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	0.3	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	0.13	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	0.12	-
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	-	-	2.08	-
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	7.4	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	0.52	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	0.5	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	-	-	< 1.8	-
Chromium (III)	mg/kg	1	NONE	-	-	18	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	19	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	34	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	7.6	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	24	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	17	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	73	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.9	3.5	< 2.5	< 2.5
Magnesium (water soluble)	mg/kg	5	NONE	12	7.1	< 5.0	< 5.0

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 25-009139
Project / Site name: Penrhys Phase 1a

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
463166	TP104	None Supplied	0.20-0.40	Brown clay and sand with gravel and stones
463167	TP103	None Supplied	1.50-1.95	Brown clay and sand with stones
464443	TP104A	None Supplied	1.00-1.20	Brown loam and sand with gravel and vegetation
464444	TP101	None Supplied	2.50-2.60	Brown clay and sand with gravel

Analytical Report Number : 25-009139
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS

Analytical Report Number : 25-009139
Project / Site name: Penrhys Phase 1a

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

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

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

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

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Analytical Report Number : 25-009154

Project / Site name:	Penrhys Phase 1a	**Samples received on:**	25/02/2025
Your job number:	30603	**Samples instructed on/ Analysis started on:**	25/02/2025
Your order number:	PO39691	**Analysis completed by:**	05/03/2025
Report Issue Number:	1	**Report issued on:**	05/03/2025
Samples Analysed:	4 soil samples - 1 leachate sample		

Signed:

Adan Cazas Garcia
Key Account Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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

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

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-009154
Project / Site name: Penrhys Phase 1a
Your Order No: PO39691

Lab Sample Number				463268	463269	463270	463271
Sample Reference				TP111	TP109	TP106	TP112
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				1.60-1.90	1.20-1.30	0.40-0.50	0.40-0.50
Date Sampled				20/02/2025	20/02/2025	20/02/2025	20/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Stone Content	%	0.1	NONE	26.9	28.7	46.1	9.9
Moisture Content	%	0.01	NONE	14	19	12	17
Total mass of sample received	kg	0.1	NONE	1.2	1.1	1.2	1.1

Asbestos

Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-
Asbestos Analyst ID	N/A	N/A	N/A	SCA	SCA	SCA	-
Analysis completed	N/A	N/A	N/A	28/02/2025	28/02/2025	28/02/2025	-

General Inorganics

pH (L099)	pH Units	N/A	MCERTS	7.8	7.2	10.6	7.8
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	630	-	1100	900
Total Sulphate as SO_4	%	0.005	MCERTS	0.063	-	0.11	0.09
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	200	62	430	240
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0981	0.031	0.217	0.122
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	98.1	31	217	122
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	4.4	-	36	12
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.2	-	18	5.7
Total Sulphur	mg/kg	50	MCERTS	230	-	410	540
Total Sulphur	%	0.005	MCERTS	0.023	-	0.041	0.054
Ammoniacal Nitrogen as NH_4^+	mg/kg	0.5	MCERTS	< 0.5	-	< 0.5	< 0.5
Ammonium as NH_4^+ (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.0065	0.019	0.0095	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	-	< 2.0	4.3
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	-	< 5.0	< 5.0

Total Phenols

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

Analytical Report Number: 25-009154
Project / Site name: Penrhys Phase 1a
Your Order No: PO39691

Lab Sample Number				463268	463269	463270	463271
Sample Reference				TP111	TP109	TP106	TP112
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A
Depth (m)				1.60-1.90	1.20-1.30	0.40-0.50	0.40-0.50
Date Sampled				20/02/2025	20/02/2025	20/02/2025	20/02/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**				
Speciated PAHs							
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.06	0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.06	0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.07	0.07	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-
Total PAH							
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	< 0.80	-
Heavy Metals / Metalloids							
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7	8.4	9.5	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.76	0.79	0.5	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	0.6	0.7	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	-
Chromium (III)	mg/kg	1	NONE	16	16	11	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	17	12	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8	11	9	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	8.9	13	21	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	32	21	12	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.4	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	17	17	14	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	90	56	37	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	4.9	-	4	12
Magnesium (water soluble)	mg/kg	5	NONE	9.8	-	8.1	23

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

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Analytical Report Number: 25-009154
Project / Site name: Penrhys Phase 1a

Your Order No: PO39691

Lab Sample Number				463267
Sample Reference				TP111
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.60-0.90
Date Sampled				20/02/2025
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
General Inorganics				
pH (automated)	pH Units	N/A	ISO 17025	9.3
Electrical Conductivity	µS/cm	10	ISO 17025	95
Total Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1.0
Free Cyanide (Low Level 1 µg/l)	µg/l	1	NONE	< 1
Sulphate as SO_4	µg/l	45	ISO 17025	4630
Chloride	mg/l	0.15	ISO 17025	2.9
Fluoride	µg/l	50	ISO 17025	180
Ammoniacal Nitrogen as N	µg/l	15	NONE	33
Ammoniacal Nitrogen as NH_3	µg/l	15	NONE	40
Ammoniacal Nitrogen as NH_4^+	µg/l	15	NONE	42
Nitrate as N	mg/l	0.01	NONE	0.04
Nitrate as NO_3	mg/l	0.05	NONE	0.18
Nitrite as N	µg/l	1	ISO 17025	4.3
Nitrite as NO_2	µg/l	5	ISO 17025	14
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002
Total Phenols				
Total Phenols (monohydric) low level	µg/l	1	NONE	2.1
Speciated PAHs				
Naphthalene	µg/l	0.01	NONE	0.12
Acenaphthylene	µg/l	0.01	NONE	< 0.01
Acenaphthene	µg/l	0.01	NONE	0.03
Fluorene	µg/l	0.01	NONE	0.03
Phenanthrene	µg/l	0.01	NONE	0.06
Anthracene	µg/l	0.01	NONE	< 0.01
Fluoranthene	µg/l	0.01	NONE	< 0.01
Pyrene	µg/l	0.01	NONE	< 0.01
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01
Chrysene	µg/l	0.01	NONE	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01
PAH Sums				
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.04	NONE	< 0.040
Sum of Benzo(ghi)perylene & Indeno(1,2,3-cd)pyrene	µg/l	0.02	NONE	< 0.020
Total PAH				
Total EPA-16 PAHs	µg/l	0.16	NONE	0.24

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Analytical Report Number: 25-009154
Project / Site name: Penrhys Phase 1a

Your Order No: PO39691

Lab Sample Number				463267
Sample Reference				TP111
Sample Number				None Supplied
Water Matrix				N/A
Depth (m)				0.60-0.90
Date Sampled				20/02/2025
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**	
Heavy Metals / Metalloids				
Aluminium (dissolved)	µg/l	12	ISO 17025	2400
Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7
Arsenic (dissolved)	µg/l	1	ISO 17025	4.3
Barium (dissolved)	µg/l	0.05	ISO 17025	26
Boron (dissolved)	µg/l	10	ISO 17025	17
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0
Chromium (III)	µg/l	5	NONE	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	4.4
Cobalt (dissolved)	µg/l	0.3	ISO 17025	< 0.3
Copper (dissolved)	µg/l	0.7	ISO 17025	4.3
Iron (dissolved)	mg/l	0.004	ISO 17025	1.6
Lead (dissolved)	µg/l	1	ISO 17025	4.4
Manganese (dissolved)	µg/l	0.06	ISO 17025	30
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.6
Silver (dissolved)	µg/l	1	NONE	< 1.0
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0
Tin (dissolved)	µg/l	1	ISO 17025	< 1.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	5.6
Zinc (dissolved)	µg/l	0.4	ISO 17025	16
Calcium (dissolved)	mg/l	0.012	ISO 17025	12
Sodium (dissolved)	mg/l	0.01	ISO 17025	1.5

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Analytical Report Number : 25-009154
Project / Site name: Penrhys Phase 1a

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
463268	TP111	None Supplied	1.60-1.90	Brown clay and loam with vegetation and stones
463269	TP109	None Supplied	1.20-1.30	Brown clay and loam with vegetation and stones
463270	TP106	None Supplied	0.40-0.50	Brown clay and sand with gravel and stones
463271	TP112	None Supplied	0.40-0.50	Brown clay and loam with vegetation and stones

Analytical Report Number : 25-009154
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	D	ISO 17025
Bromate in leachate by IC	Determination of bromate in leachate based on ion chromatography	In-house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008B	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight	In-house method based on British Standard Methods and MCERTS requirements.	L019B	D	NONE
Electrical conductivity at 20°C of leachate	Determination of electrical conductivity in leachate by electrometric measurement	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031B	W	ISO 17025
Fluoride in leachate	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination	L033B	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L038B	D	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES	In-house method based on Second Site Properties version 3	L038B	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES	In-house method based on TRL 447	L038B	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES	In-house method	L038B	D	MCERTS
Exotic metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil	L039B	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
Nitrate as N in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE
Nitrate, leachate soluble, in leachate	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08	L078-PL	W	NONE

Analytical Report Number : 25-009154
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Water Soluble Nitrate (leachate equivalent)	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction	L078-PL	W	NONE
Chromium III in leachate	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL	W	NONE
Chromium III in soil	In-house method by calculation from total Cr and Cr VI	In-house method by calculation	L080-PL/L130B	W	NONE
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry	In-house method	L080-PL	W	MCERTS
Free cyanide (low level) in leachate	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols (low level) in leachate	Determination of phenols in leachate by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Total cyanide (low level) in leachate	Determination of total cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	NONE
Chloride in leachate	Determination of Chloride colorimetrically by discrete analyser	In-house based on MEWAM Method ISBN 0117516260	L082B	W	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser	In-house method	L082B	D	MCERTS
Ammonia as NH3 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	MCERTS
Nitrite as N in leachate	Determination of nitrite in leachate by addition of sulphanilamide and NED followed by discrete analyser (colorimetry)	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

Analytical Report Number : 25-009154
Project / Site name: Penrhys Phase 1a

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement	In-house method	L099-PL	D	MCERTS
pH at 20°C in leachate (automated)	Determination of pH in leachate by electrometric measurement	In-house method	L099-PL	W	ISO 17025
Speciated PAHs and/or Semi-volatile organic compounds in leachate	SVOCs and PAHs in leachate	In-house method	L102B		NONE
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082B	W	NONE
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate	In-house method	L009B	D	MCERTS
Nitrite, leachate soluble, in leachate	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton & Polish Standard Method PN-82/C-04579.08	L082B	W	ISO 17025

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

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

GAC derivation

Background

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

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

Land use scenarios

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

All GAC have been rounded to two significant figures.

Exposure parameters

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

Approach to consumption rates

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

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

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

Chemical and toxicity parameters

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

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

Approach to Cyanide GAC

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

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

Approach to Phenol GAC

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

Approach to PCB GAC

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

Sub-surface soil to indoor air correction factors

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

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

- TPHCWG fractions, namely aliphatic EC>5-44 and aromatic EC>6-44;
- PAHs (acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene), benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h,)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene);
- BTEX;
- Isopropylbenzene;
- Propylbenzene;
- 1,2,4- and 1,3,5-trimethylbenzene; and
- Styrene.

Approach to saturation limits

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

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

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

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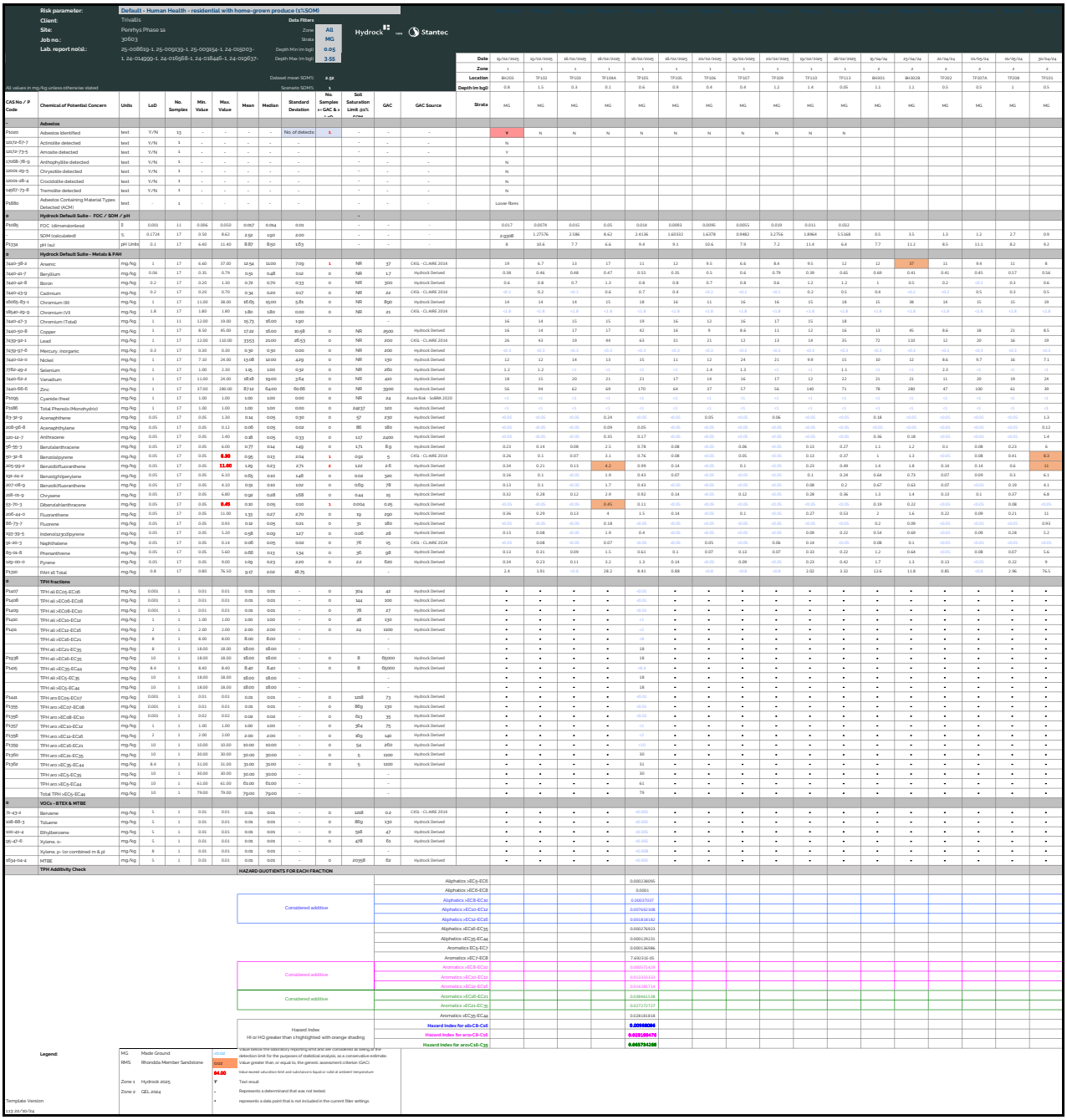
Human health GAC screening results

Assessment of Chemicals of Potential Concern to Human Health - Made Ground



Risk parameter:	Default - Human Health - residential with home-grown produce (1%SOM)
Client:	Trivallis
Site:	Penrhys Phase 1a
Job no.:	30603
Lab. report no(s).:	25-008619-1, 25-009139-1, 25-009154-1, 24-015003-1, 24-014999-1, 24-016568-1, 24-018446-1, 24-019637-

Data Filters: Zone All; Strata MG; Depth Min (m bgl) 0.05; Depth Max (m bgl) 3.55; Dataset mean SOM% 2.52; Scenario SOM% 1

Hydrock Stantec

All values in mg/kg unless otherwise stated.

Date	19/02/2025	19/02/2025	18/02/2025	18/02/2025	18/02/2025	18/02/2025	20/02/2025	19/02/2025	20/02/2025	19/02/2025	18/02/2025	15/04/24	23/04/24	22/04/24	01/05/24	01/05/24	30/04/24
Zone	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
Location	BH201	TP102	TP103	TP104A	TP105	TP106	TP106	TP107	TP108	TP110	TP113	BH101	BH102B	TP202	TP207A	TP208	TP101
Depth (m bgl)	0.8	1.5	0.3	0.1	0.4	0.9	0.4	0.4	1.2	1.4	0.05	1.1	1.1	0.5	0.5	1	0.5
Strata	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
C	**Asbestos**																
Pa120	Asbestos Identified	Y	N	N	N	N	N	N	N	N	N	N					
Pa122-617-7	Actinolite detected	N															
Pa122-73-5	Amosite detected	Y															
Pa158-76-9	Anthophyllite detected	N															
Pa120-29-5	Chrysotile detected	N															
Pa120-28-4	Crocidolite detected	N															
Pa877-73-8	Tremolite detected	N															
Pa880	Asbestos Containing Material Types Detected (ACM)	Loose fibres															
B	**Hydrock Default Suite - POC / SOM / pH**																
Pa185	POC (dimensionless)	0.017	0.0074	0.015	0.01	0.014	0.0083	0.0095	0.0055	0.019	0.011	0.012					
	SOM (calculated)	2.9398	1.27576	2.586	1.742	2.4136	1.43312	1.6379	0.9482	3.2756	1.8964	5.5168	0.5	3.5	1.3	1.2	2.7	0.9
Pc134	pH (lab)	8	10.6	7.7	6.4	9.4	9.1	10.6	7.9	7.2	11.4	6.4	7.7	11.2	8.5	11.1	8.2	9.2
A	**Hydrock Default Suite - Metals & PAH**																	
Na10-38-2	Arsenic	19	6.7	13	17	11	12	8.5	6.4	8.4	9.5	12	12	37	11	9.4	11	8
Na10-41-7	Beryllium	0.38	0.46	0.48	0.47	0.55	0.35	0.5	0.4	0.79	0.39	0.65	0.69	0.41	0.41	0.45	0.57	0.56
Na10-42-8	Boron	0.6	0.8	0.7	1.3	0.8	0.8	0.7	0.8	0.6	1.2	1.2	1	0.5	0.2	<0.2	0.3	0.6
Na10-43-9	Cadmium	<0.2	0.2	<0.2	0.4	0.7	0.4	<0.2	<0.2	<0.2	0.2	0.5	0.4	<0.2	<0.2	0.5	0.3	0.5
Na10-65-3-1	Chromium (III)	14	14	14	15	18	16	11	16	16	15	18	15	28	14	15	15	19
Na10-29-9	Chromium (VI)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Na10-47-3	Chromium (Total)	14	14	15	15	19	16	12	16	17	15	18	-	-	-	-	-	-
Na10-50-8	Copper	16	14	17	17	42	16	9	8.6	11	12	16	13	45	8.6	18	21	8.5
Na10-92-1	Lead	26	43	19	44	63	31	21	12	13	14	35	72	110	12	20	16	19
Na10-97-6	Mercury, inorganic	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Na10-02-0	Nickel	12	12	14	13	15	11	12	24	21	9.9	15	10	12	8.6	9.7	16	7.1
Na10-49-2	Selenium	1.2	1.2	<1	<1	<1	<1	1.4	1.3	<1	<1	1.1	<1	<1	2.3	<1	<1	<1
Na10-62-2	Vanadium	18	15	20	21	21	17	14	14	17	12	22	21	21	11	20	19	24
Na10-66-6	Zinc	56	84	62	69	170	64	37	57	56	140	71	78	280	47	100	61	39
Pa195	Cyanide (free)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pa186	Total Phenols (Monohydric)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
83-32-9	Acenaphthene	<0.05	<0.05	<0.05	0.24	<0.05	<0.05	0.06	<0.05	0.06	<0.05	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	1.3
208-96-8	Acenaphthylene	<0.05	<0.05	<0.05	0.09	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
120-12-7	Anthracene	<0.05	<0.05	<0.05	0.35	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.36	0.18	<0.05	<0.05	<0.05	1.4
56-55-3	Benzo(a)anthracene	0.23	0.14	0.08	2.5	0.78	0.08	<0.05	0.06	<0.05	0.13	0.27	1.1	1.2	0.1	0.08	0.22	6
50-32-8	Benzo(a)pyrene	0.26	0.1	0.07	3.1	0.74	0.08	<0.05	0.05	<0.05	0.13	0.27	1	1.3	<0.05	0.08	0.61	8.3
205-99-2	Benzo(b)fluoranthene	0.34	0.21	0.13	4.2	0.99	0.14	<0.05	0.1	<0.05	0.23	0.49	1.4	1.8	0.16	0.14	0.6	11
191-24-2	Benzo(ghi)perylene	0.16	0.1	<0.05	1.9	0.43	0.07	<0.05	<0.05	<0.05	0.1	0.24	0.64	0.79	0.07	0.09	0.3	6.1
207-08-9	Benzo(k)fluoranthene	0.13	0.1	<0.05	1.7	0.43	<0.05	<0.05	<0.05	<0.05	0.08	0.2	0.67	0.63	0.07	<0.05	0.19	6.1
218-01-9	Chrysene	0.32	0.28	0.12	2.9	0.92	0.14	<0.05	0.12	<0.05	0.28	0.36	1.3	1.4	0.13	0.1	0.37	6.8
53-70-3	Dibenz(ah)anthracene	<0.05	<0.05	<0.05	0.45	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	0.22	<0.05	<0.05	0.08	<0.05
206-44-0	Fluoranthene	0.36	0.29	0.13	4	1.5	0.14	<0.05	0.1	<0.05	0.27	0.53	2	1.6	0.22	0.09	0.21	11
86-73-7	Fluorene	<0.05	<0.05	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2	0.09	<0.05	<0.05	<0.05	<0.05	0.93
193-39-5	Indeno(123cd)pyrene	0.13	0.08	<0.05	1.9	0.4	<0.05	<0.05	<0.05	0.09	0.22	0.54	0.69	<0.05	0.09	0.28	5.2	
91-20-3	Naphthalene	<0.05	0.08	<0.05	0.07	<0.05	<0.05	0.05	<0.05	0.06	0.14	<0.05	0.08	0.1	<0.05	<0.05	<0.05	<0.05
85-01-8	Phenanthrene	0.13	0.31	0.09	1.5	0.61	0.1	0.07	0.13	0.07	0.33	0.22	1.2	0.64	<0.05	0.08	0.07	5.6
129-00-0	Pyrene	0.34	0.23	0.11	3.2	1.3	0.14	<0.05	0.09	<0.05	0.23	0.42	1.7	1.3	0.13	<0.05	0.22	9
Pc110	PAH 16 Total	2.4	1.91	<0.8	28.2	8.41	0.88	<0.8	<0.8	<0.8	2.02	3.32	12.4	11.8	0.85	<0.8	2.96	74.5
B	**TPH fractions**																	
Pa107	TPH all (EC5-EC16)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa108	TPH all (>EC16-EC18)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa109	TPH all (>EC18-EC21)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa110	TPH all (>EC21-EC12)	•	•	•	•	<1	•	•	•	•	•	•	•	•	•	•	•	•
Pa111	TPH all (>EC12-EC16)	•	•	•	•	<2	•	•	•	•	•	•	•	•	•	•	•	•
	TPH all (>EC16-EC21)	•	•	•	•	<8	•	•	•	•	•	•	•	•	•	•	•	•
	TPH all (>EC21-EC35)	•	•	•	•	18	•	•	•	•	•	•	•	•	•	•	•	•
Pa238	TPH all (>EC16-EC35)	•	•	•	•	18	•	•	•	•	•	•	•	•	•	•	•	•
Pa165	TPH all (>EC35-EC44)	•	•	•	•	<8.4	•	•	•	•	•	•	•	•	•	•	•	•
	TPH all (>EC5-EC35)	•	•	•	•	18	•	•	•	•	•	•	•	•	•	•	•	•
	TPH all (>EC5-EC44)	•	•	•	•	18	•	•	•	•	•	•	•	•	•	•	•	•
Pa111	TPH aro (EC5-EC21)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa155	TPH aro (>EC16-EC16)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa196	TPH aro (>EC16-EC21)	•	•	•	•	<0.01	•	•	•	•	•	•	•	•	•	•	•	•
Pa157	TPH aro (>EC21-EC12)	•	•	•	•	<1	•	•	•	•	•	•	•	•	•	•	•	•
Pa158	TPH aro (>EC12-EC16)	•	•	•	•	<2	•	•	•	•	•	•	•	•	•	•	•	•
Pa159	TPH aro (>EC16-EC21)	•	•	•	•	<10	•	•	•	•	•	•	•	•	•	•	•	•
Pa160	TPH aro (>EC21-EC35)	•	•	•	•	10	•	•	•	•	•	•	•	•	•	•	•	•
Pa162	TPH aro (>EC35-EC44)	•	•	•	•	21	•	•	•	•	•	•	•	•	•	•	•	•
	TPH aro (>EC5-EC35)	•	•	•	•	10	•	•	•	•	•	•	•	•	•	•	•	•
	TPH aro (>EC5-EC44)	•	•	•	•	61	•	•	•	•	•	•	•	•	•	•	•	•
	Total TPH >EC5-EC44	•	•	•	•	79	•	•	•	•	•	•	•	•	•	•	•	•
B	**VOCs - BTEX & MTBE**																	
71-43-2	Benzene	<0.005	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
108-88-3	Toluene	<0.005	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
100-41-4	Ethylbenzene	<0.005	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
95-47-6	Xylene, o-	<0.001	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Xylene, p- (or combined m & p)	<0.002	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1634-04-4	MTBE	<0.005	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	TPH Additivity Check																	
	HAZARD QUOTIENTS FOR EACH FRACTION																	
	Aliphatics >EC5-EC6					0.000238095												
	Aliphatics >EC6-EC8					0.0001												
Considered additive	Aliphatics >EC8-EC10					0.00037037												
	Aliphatics >EC10-EC12					0.007692308												
	Aliphatics >EC12-EC16					0.001818182												
	Aliphatics >EC16-EC35					0.000276923												
	Aliphatics >EC35-EC44					0.000129231												
	Aromatics EC5-EC7					0.000136986												
	Aromatics >EC7-EC8					7.69231E-05												
Considered additive	Aromatics >EC8-EC10					0.000571429												
	Aromatics >EC10-EC12					0.013333333												
	Aromatics >EC12-EC16					0.014285714												
Considered additive	Aromatics >EC16-EC21					0.038461538												
	Aromatics >EC21-EC35					0.027272727												
	Aromatics >EC35-EC44					0.026181818												
	Hazard Index for alis C8-C16					**0.009890804**												
	Hazard Index for aros C8-C16					**0.031388479**												
	Hazard Index for aros>C16-C35					**0.065734288**												

Hazard Index: HI or HQ greater than 1 highlighted with orange shading

Legend:

MG	Made Ground
RMS	Rhondda Member Sandstone
Zone 1	Hydrock 2025
Zone 2	GEL 2024
<0.02	Value below the laboratory reporting limit and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
0.02	Value greater than, or equal to, the generic assessment criterion (GAC).
64.00	Value exceed saturation limit and substance is liquid or solid at ambient temperature
F	Test result
-	Represents a determinand that was not tested.
•	represents a data point that is not included in the current filter settings.

Template Version: v23.22/30/24

Assessment of Chemicals of Potential Concern to Human Health - Rhondda Member

Risk parameter:	Default - Human Health - residential with home-grown produce (1%SOM)
Client:	Trivallis
Site:	Penrhys Phase 1a
Job no.:	30603
Lab. report no(s).:	25-008619-1, 25-009139-1, 25-009154-1, 24-015003-1, 24-014999-1, 24-016568-1, 24-018446-1, 24-019637-1

Data Filters

Zone	All
Strata	RMS
Depth Min (m bgl)	0.05
Depth Max (m bgl)	3.55

Hydrock now Stantec

Dataset mean SOM%

All values in mg/kg unless otherwise stated — Scenario SOM% 1

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	Soil Saturation Limit @1% SOM	GAC	GAC Source	Strata	Date	18/02/2025	20/02/2025	16/04/24
															Zone	1	1	2
															Location	TP104A	TP111	BH301
															Depth (m bgl)	1	1.6	3.55
-	**Asbestos**																	
P1020	Asbestos Identified	text	Y/N	13	-	-	-	-	No. of detects:	0	-	-	-			N	N	
12172-67-7	Actinolite detected	text	Y/N	1	-	-	-	-	-		-	-	-					
12172-73-5	Amosite detected	text	Y/N	1	-	-	-	-	-		-	-	-					
17068-78-9	Anthophyllite detected	text	Y/N	1	-	-	-	-	-		-	-	-					
12001-29-5	Chrysotile detected	text	Y/N	1	-	-	-	-	-		-	-	-					
12001-28-4	Crocidolite detected	text	Y/N	1	-	-	-	-	-		-	-	-					
14567-73-8	Tremolite detected	text	Y/N	1	-	-	-	-	-		-	-	-					
P1880	Asbestos Containing Material Types Detected (ACM)	text	-	1	-	-	-	-	-		-	-	-					
o	**Hydrock Default Suite - FOC / SOM / pH**										-							
P1085	FOC (dimensionless)	||	0.001	2	0.007	0.015	0.011	0.011	0.01		-	-	-			0.015	0.0065	
-	SOM (calculated)	%	0.1724	4					-		-	-	-			2.586	1.1206	1.3
P1334	pH (su)	pH Units	0.1	3	7.30	10.80	8.63	7.80	1.89		-	-	-			7.3	7.8	10.8
o	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	3	7.00	8.70	7.70	7.40	0.89	0	NR	37	C4SL - CL:AIRE 2014			7.4	7	8.7
7440-41-7	Beryllium	mg/kg	0.06	3	0.52	1.60	0.96	0.76	0.57	0	NR	1.7	Hydrock Derived			0.52	0.76	1.6
7440-42-8	Boron	mg/kg	0.2	3	0.20	0.50	0.40	0.50	0.17	0	NR	300	Hydrock Derived			0.5	0.5	<0.2
7440-43-9	Cadmium	mg/kg	0.2	3	0.20	0.20	0.20	0.20	0.00	0	NR	22	C4SL - CL:AIRE 2014			<0.2	<0.2	<0.2
16065-83-1	Chromium (III)	mg/kg	1	3	16.00	18.00	16.67	16.00	1.15	0	NR	890	Hydrock Derived			18	16	16
18540-29-9	Chromium (VI)	mg/kg	1.8	3	1.80	1.80	1.80	1.80	0.00	0	NR	21	C4SL - CL:AIRE 2014			<1.8	<1.8	<1.8
7440-47-3	Chromium (Total)	mg/kg	1	2	17.00	19.00	18.00	18.00	1.41			-				19	17	
7440-50-8	Copper	mg/kg	1	3	5.20	34.00	15.73	8.00	15.88	0	NR	2500	Hydrock Derived			34	8	5.2
7439-92-1	Lead	mg/kg	1	3	2.80	8.90	6.43	7.60	3.21	0	NR	200	C4SL - CL:AIRE 2014			7.6	8.9	2.8
7439-97-6	Mercury, inorganic	mg/kg	0.3	3	0.30	0.30	0.30	0.30	0.00	0	NR	200	Hydrock Derived			<0.3	<0.3	<0.3
7440-02-0	Nickel	mg/kg	1	3	24.00	42.00	32.67	32.00	9.02	0	NR	130	Hydrock Derived			24	32	42
7782-49-2	Selenium	mg/kg	1	3	1.00	1.00	1.00	1.00	0.00	0	NR	260	Hydrock Derived			<1	<1	<1
7440-62-2	Vanadium	mg/kg	1	3	17.00	20.00	18.00	17.00	1.73	0	NR	410	Hydrock Derived			17	17	20
7440-66-6	Zinc	mg/kg	1	3	73.00	90.00	79.00	74.00	9.54	0	NR	3900	Hydrock Derived			73	90	74
P1095	Cyanide (free)	mg/kg	1	3	1.00	1.00	1.00	1.00	0.00	0	NR	24	Acute Risk - SoBRA 2020			<1	<1	<1
P1186	Total Phenols (Monohydric)	mg/kg	1	3	1.00	1.00	1.00	1.00	0.00	0	24237	120	Hydrock Derived			<1	<1	<1
83-32-9	Acenaphthene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	57	230	Hydrock Derived			<0.05	<0.05	<0.05
208-96-8	Acenaphthylene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	86	180	Hydrock Derived			<0.05	<0.05	<0.05
120-12-7	Anthracene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	1.17	2400	Hydrock Derived			<0.05	<0.05	<0.05
56-55-3	Benz(a)anthracene	mg/kg	0.05	3	0.05	0.22	0.11	0.05	0.10	0	1.71	8.9	Hydrock Derived			0.22	<0.05	<0.05
50-32-8	Benzo(a)pyrene	mg/kg	0.05	3	0.05	0.30	0.13	0.05	0.14	0	0.91	5	C4SL - CL:AIRE 2014			0.3	<0.05	<0.05
205-99-2	Benzo(b)fluoranthene	mg/kg	0.05	3	0.05	0.38	0.16	0.05	0.19	0	1.22	2.6	Hydrock Derived			0.38	<0.05	<0.05
191-24-2	Benzo(ghi)perylene	mg/kg	0.05	3	0.05	0.12	0.07	0.05	0.04	0	0.02	320	Hydrock Derived			0.12	<0.05	<0.05
207-08-9	Benzo(k)fluoranthene	mg/kg	0.05	3	0.05	0.17	0.09	0.05	0.07	0	0.69	78	Hydrock Derived			0.17	<0.05	<0.05
218-01-9	Chrysene	mg/kg	0.05	3	0.05	0.26	0.12	0.05	0.12	0	0.44	15	Hydrock Derived			0.26	<0.05	<0.05
53-70-3	Dibenz(ah)anthracene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	0.004	0.25	Hydrock Derived			<0.05	<0.05	<0.05
206-44-0	Fluoranthene	mg/kg	0.05	3	0.05	0.21	0.10	0.05	0.09	0	19	290	Hydrock Derived			0.21	<0.05	<0.05
86-73-7	Fluorene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	31	180	Hydrock Derived			<0.05	<0.05	<0.05
193-39-5	Indeno(123cd)pyrene	mg/kg	0.05	3	0.05	0.13	0.08	0.05	0.05	0	0.06	28	Hydrock Derived			0.13	<0.05	<0.05
91-20-3	Naphthalene	mg/kg	0.05	3	0.05	0.05	0.05	0.05	0.00	0	76	15	C4SL - CL:AIRE 2024			<0.05	<0.05	<0.05
85-01-8	Phenanthrene	mg/kg	0.05	3	0.05	0.07	0.06	0.05	0.01	0	36	98	Hydrock Derived			0.07	<0.05	<0.05
129-00-0	Pyrene	mg/kg	0.05	3	0.05	0.22	0.11	0.05	0.10	0	2.2	620	Hydrock Derived			0.22	<0.05	<0.05
P1310	PAH 16 Total	mg/kg	0.8	3	0.80	2.08	1.23	0.80	0.74			-				2.08	<0.8	<0.8

Legend:

MG	Made Ground
RMS	Rhondda Member Sandstone
Zone 1	Hydrock 2025
Zone 2	GEL 2024

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

Template Version:
113: 22/10/24

Phytotoxic GAC screening results

Assessment of Chemicals of Potential Concern to Plant Life - all strata

Risk parameter:	**Phytotoxic pH >7**
Client:	Trivallis
Site:	Penrhys Phase 1a
Job no.:	30603
Lab. report no(s).:	25-008619-1, 25-009139-1, 25-009154-1, 24-015003-1, 24-014999-1, 24-016568-1, 24-018446-1, 24-019637-1

Data Filters

Zone	**All**
Strata	**All**
Depth Min (m bgl)	**0.05**
Depth Max (m bgl)	**3.55**
Dataset mean pH	**8.84**
Scenario pH	**>7**

Hydrock now Stantec

All values in mg/kg unless otherwise stated

CAS No / P Code	Chemical of Potential Concern	Units	LoD	No. Samples	Min. Value	Max. Value	Mean	Median	Standard Deviation	No. Samples >= GAC & > LoD	GAC	GAC Source	Strata	Date	Zone	Location	Depth (m bgl)	Strata
														19/02/2025	1	BH203	0.8	MG
														19/02/2025	1	TP102	1.5	MG
														18/02/2025	1	TP103	0.3	MG
														18/02/2025	1	TP104A	0.1	MG
														18/02/2025	1	TP104A	1	RMS
														18/02/2025	1	TP105	0.6	MG
														18/02/2025	1	TP105	0.9	MG
														20/02/2025	1	TP106	0.4	MG
														19/02/2025	1	TP107	0.4	MG
														20/02/2025	1	TP109	1.2	MG
														19/02/2025	1	TP110	1.4	MG
														20/02/2025	1	TP111	1.6	RMS
														18/02/2025	1	TP113	0.05	MG
														15/04/24	2	BH301	1.1	MG
														16/04/24	2	BH301	3.55	RMS
														23/04/24	2	BH302B	1.1	MG
														22/04/24	2	TP202	0.5	MG
														01/05/24	2	TP207A	0.5	MG
														01/05/24	2	TP208	1	MG
														30/04/24	2	TP101	0.5	MG
0	**Hydrock Default Suite - FOC / SOM / pH**																	
P1334	pH (su)	pH Units	0.1	20	6.40	11.40	8.84	8.35	1.62		-	-		8	10.6	7.7	6.6	7.3
														9.4	9.1	10.6	7.9	7.2
														11.4	7.8	6.4	7.7	10.8
														11.2	8.5	11.1	8.2	9.2
0	**Hydrock Default Suite - Metals & PAH**																	
7440-38-2	Arsenic	mg/kg	1	20	6.60	37.00	11.81	10.25	6.75	0	250	MAFF 1998		19	6.7	13	17	7.4
														11	12	9.5	6.6	8.4
														9.5	7	12	12	8.7
														37	11	9.4	11	8
7440-42-8	Boron	mg/kg	0.2	20	0.20	1.30	0.68	0.65	0.33	0	5	Nable, et al. 1997		0.6	0.8	0.7	1.3	0.5
														0.8	0.8	0.7	0.8	0.6
														1.2	0.5	1.2	1	<0.2
														0.5	0.2	<0.2	0.3	0.6
16065-83-1	Chromium (III)	mg/kg	1	20	11.00	38.00	16.65	15.50	5.34	0	400	MAFF 1998 (Cr(T))		14	14	14	15	18
														18	16	11	16	16
														15	16	18	15	16
														38	14	15	15	19
18540-29-9	Chromium (VI)	mg/kg	1.8	20	1.80	1.80	1.80	1.80	0.00	0	25	ICRCL 70/90 1990		<1.8	<1.8	<1.8	<1.8	<1.8
														<1.8	<1.8	<1.8	<1.8	<1.8
														<1.8	<1.8	<1.8	<1.8	<1.8
														<1.8	<1.8	<1.8	<1.8	<1.8
7440-50-8	Copper	mg/kg	1	20	5.20	45.00	17.00	15.00	11.01	0	200	BS3882 2015		16	14	17	17	34
														42	16	9	8.6	11
														12	8	16	13	5.2
														45	8.6	18	21	8.5
7440-02-0	Nickel	mg/kg	1	20	7.10	42.00	16.02	12.50	8.69	0	110	BS3882 2015		12	12	14	13	24
														15	11	12	24	21
														9.9	32	15	10	42
														12	8.6	9.7	16	7.1
7440-66-6	Zinc	mg/kg	1	20	37.00	280.00	85.90	70.00	55.83	0	300	BS3882 2015		56	94	62	69	73
														170	64	37	57	56
														140	90	71	78	74
														280	47	100	61	39

Legend:

MG	Made Ground
RMS	Rhondda Member Sandstone

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

Template Version:
113: 22/10/24

Controlled waters GAC screening results

Groundwater Risk Assessment of Soil Leachate Data

Scenario	Controlled Waters (England & Wales)
Assessment Level	RTM Level 1 - Soil Zone Assessment - leachate samples
Data set:	Leachate
Client:	Trivallis
Site:	Penrhys Village
Job no:	C30603
Lab. report no(s).:	25-008619-2, 25-009154-1

Hydrock now Stantec

Data Filters	
Zone	All Zones
Strata Filter	All Strata
Date Min	22/04/2024
Date Max	20/02/2025

Results Shading Key	
123*	Exceeds solubility value
<1	Grey text and "<" sign if value <= L
50	Exceeds screening value
500	Exceeds 10 x screening value

		Determinand Designations			Sample Summaries						Water Quality Target (WQT) (Exceeded if Red Text)										No. Samples > WQT	No. Samples above LoD > WQT	Zone	1	1	2	3
																							Screened Strata	Made Ground	Made Ground	Made Ground	Made Ground
																							Date	18/02/25	20/02/25	22/04/24	01/05/24
																							Sampling Round	0.3	0.6	1.5	1
CAS / AGS Number	Determinand	EQS Category	Hazardous Substance Status	Solubility Limit (µg/l)	Units	Limit of Detection (Lod)	No. of Samples	No. of Samples > LoD	Min	Max	EQS (inland) (England and Wales)		-		-		Screening Value (minimum of WQT)						Location	TP103	TP111	TP202	TP208
P1133	Hardness as mg/l $CaCO_3$	-	-	-	mgCaCO3/l	0	2	2	17.8	60.9	-	-	-	-	-	-	-									17.8	60.9
P1134	pH (min.) (su)	O	-	-	pH Units	0	4	4	7.4	9.3	6	h	-	-	-	-	6	0	0					8	9.3	7.4	8.2
P1287	Electrical conductivity (µS/cm)	-	-	-	µS/cm	0	4	4	42	100	-	-	-	-	-	-	-	-	-					86	95	42	100
P1095	Cyanide (free) (hydrogen cyanide)	SP	NP	-	µg/l	1	4	0	<1	<1	1	h	-	-	-	-	1	0	0					<1	<1	<1	<1
57-12-5	Cyanide (total)	-	-	-	µg/l	1	4	0	<1	<1	-	-	-	-	-	-	-	-	-					<1	<1	<1	<1
P1140	Ammonium (NH_4^+)	-	NP	-	µg/l	15	4	4	29	650	-	-	-	-	-	-	-	-	-					650	42	80	29
P1238	Ammnoniacal Nitrogen (as N)	-	NP	-	µg/l	15	2	2	33	510	300	g	-	-	-	-	300	1	1					510	33		
P1720	Ammonia (unionised) (NH_3 as N) (free ammonia)	SP	NP	-	µg/l	15	2	2	40	610	-	h	-	-	-	-	-	-	-					610	40		
15541-45-4	Bromate (BrO_3)	-	-	-	mg/l	0.002	4	0	<0.002	<0.002	-	-	-	-	-	-	-	-	-					<0.002	<0.002	<0.002	<0.002
16887-00-6	Chloride (Cl^-)	O	-	-	mg/l	0.15	4	4	0.97	320	250	h	-	-	-	-	250	1	1					1.8	2.9	0.97	320
16984-48-8	Fluoride (F^-)	O	-	-	µg/l	50	4	3	29	180	1000	h	-	-	-	-	1000	0	0					150	180	80	<25
P1348	Nitrate (NO_3^-)	-	-	-	mg/l	0.05	4	4	0.18	1.04	-	-	-	-	-	-	-	-	-					0.86	0.18	0.6	1.04
P1349	Nitrite (NO_2^-)	-	-	-	µg/l	5	4	3	<5	37	-	-	-	-	-	-	-	-	-					37	14	<5	25
14808-79-8	Sulfate (SO_4^{2-})	O	-	-	mg/l	0.045	4	4	1	4630	400	h	-	-	-	-	400	2	2					4100	4630	1.13	1
7429-90-5	Aluminium (Al) (dissolved)	-	-	-	µg/l	1	4	4	28	2400	-	-	-	-	-	-	-							210	2400	28	62
7440-36-0	Antimony (Sb) (dissolved)	-	NP	-	µg/l	0.4	4	0	1.7	1.7	-	-	-	-	-	-	-	-	-					<1.7	<1.7	<1.7	<1.7
7440-38-2	Arsenic (As) (dissolved)	SP	H	-	µg/l	0.15	4	4	1.3	4.3	50	h	-	-	-	-	50	0	0					2.1	4.3	1.3	1.8
7440-39-3	Barium (Ba) (dissolved)	-	-	-	µg/l	0.06	4	4	3.4	26	-	-	-	-	-	-	-	-	-					8.9	26	3.4	9.3
7440-42-8	Boron (B) (dissolved)	O	NP	-	µg/l	10	4	2	<10	18	2000	h	-	-	-	-	2000	0	0					18	17	<10	<10
7440-43-9	Cadmium (Cd) (dissolved)	PHS	NP	-	µg/l	0.02	4	0	0.08	0.08	0.08	h	-	-	-	-	0.08	0	0					<0.08	<0.08	<0.08	<0.08
7440-70-2	Calcium (Ca) (dissolved)	-	-	-	mg/l	0.012	2	2	12	14	-	-	-	-	-	-	-	-	-					14	12		
16065-83-1	Chromium (Cr III) (dissolved)	SP	-	-	µg/l	5	4	0	<5	<5	4.7	h	-	-	-	-	4.7	4	0					<5	<5	<5	<5
18540-29-9	Chromium (Cr VI) (dissolved)	SP	H	-	µg/l	5	4	0	<5	<5	3.4	h	-	-	-	-	3.4	4	0					<5	<5	<5	<5
7440-47-3	Chromium (Cr) (dissolved)	-	-	-	µg/l	0.2	4	3	0.4	4.4	-	-	-	-	-	-	-	-	-					0.7	4.4	<0.4	1.2
7440-48-4	Cobalt (Co) (dissolved)	O	NP	-	µg/l	0.2	4	0	0.3	0.3	3	h	-	-	-	-	3	0	0					<0.3	<0.3	<0.3	<0.3
7440-50-8	Copper (Cu) (dissolved)	SP	NP	-	µg/l	0.5	4	4	2.3	8	1	h	-	-	-	-	1	4	4					2.3	4.3	3.9	8
7439-89-6	Iron (Fe) (dissolved)	SP	-	-	mg/l	0.004	4	4	0.008	1.6	1	h	-	-	-	-	1	1	1					0.24	1.6	0.008	0.19
7439-92-1	Lead (Pb) (dissolved)	PS	H	-	µg/l	0.2	4	2	1	4.4	1.2	h	-	-	-	-	1.2	2	2					<1	4.4	1.9	<1
P1286	Manganese (Mn) (dissolved)	SP	-	-	µg/l	0.05	4	4	5.6	57	123	h	-	-	-	-	123	0	0					5.6	30	33	57
7439-97-6	Mercury (Hg) (dissolved)	PHS	H	56	µg/l	0.05	4	0	0.007	0.5	0.07	h	-	-	-	-	0.07	2	0					<0.5	<0.5	<0.007	<0.007
7440-02-0	Nickel (Ni) (dissolved)	PS	NP	-	µg/l	0.5	4	2	0.3	1.6	4	h	-	-	-	-	4	0	0					0.6	1.6	<0.3	<0.3
7782-49-2	Selenium (Se) (dissolved)	-	NP	-	µg/l	0.6	4	0	1	4	-	-	-	-	-	-	-	-	-					<4	<4	<4	<4
7440-22-4	Silver (Ag) (dissolved)	O	-	-	µg/l	1	4	0	<1	<1	0.05	h	-	-	-	-	0.05	4	0					<1	<1	<1	<1
7440-23-5	Sodium (Na) (dissolved)	-	-	-	mg/l	0.01	3	3	0.91	1.8	-	-	-	-	-	-	-	-	-					2.2.	1.5	0.91	1.8
7440-31-5	Tin (Sn) (dissolved)	O	-	-	µg/l	0.2	2	0	1	1	25	h	-	-	-	-	25	0	0					<1	<1		
7440-62-2	Vanadium (V) (dissolved)	O	-	-	µg/l	0.2	4	1	1.7	5.6	20	h	-	-	-	-	20	0	0					<1.7	5.6	<1.7	<1.7
7440-66-6	Zinc (Zn) (dissolved)	SP	NP	-	µg/l	0.5	2	1	0.4	16	10.9	h	-	-	-	-	10.9	1	1					<0.4	16		
83-32-9	Acenaphthene	-	H	4110	µg/l	0.01	4	2	<0.01	0.06	-	-	-	-	-	-	-	-	-					0.06	0.03	<0.01	<0.01
208-96-8	Acenaphthylene	-	-	7950	µg/l	0.01	4	1	<0.01	0.15	-	-	-	-	-	-	-	-	-					0.15	<0.01	<0.01	<0.01
120-12-7	Anthracene	PHS	H	56	µg/l	0.01	4	0	<0.01	<0.01	0.1	h	-	-	-	-	0.1	0	0					<0.01	<0.01	<0.01	<0.01
56-55-3	Benzo(a)anthracene	-	-	3.8	µg/l	0.01	4	0	<0.01	<0.01	-	-	-	-	-	-	-	-	-					<0.01	<0.01	<0.01	<0.01
50-32-8	Benzo(a)pyrene	PHS	H	3.8	µg/l	0.01	4	0	<0.01	<0.01	0.00017	h	-	-	-	-	0.00017	4	0					<0.01	<0.01	<0.01	<0.01
205-99-2	Benzo(b)fluoranthene	PHS	H	2	µg/l	0.01	4	0	<0.01	<0.01	0.017	h	-	-	-	-	0.017	0	0					<0.01	<0.01	<0.01	<0.01
191-24-2	Benzo(ghi)perylene	PHS	H	0.26	µg/l	0.01	4	0	<0.01	<0.01	0.0082	h	-	-	-	-	0.0082	4	0					<0.01	<0.01	<0.01	<0.01
207-08-9	Benzo(k)fluoranthene	PHS	H	0.8	µg/l	0.01	4	0	<0.01	<0.01	0.017	h	-	-	-	-	0.017	0	0					<0.01	<0.01	<0.01	<0.01
218-01-9	Chrysene	-	-	2	µg/l	0.01	4	0	<0.01	<0.01	-	-	-	-	-	-	-	-	-					<0.01	<0.01	<0.01	<0.01
53-70-3	Dibenz(a,h)anthracene	-	-	0.6	µg/l	0.01	4	0	<0.01	<0.01	-	-	-	-	-	-	-	-	-					<0.01	<0.01	<0.01	<0.01
206-44-0	Fluoranthene	PS	H	230	µg/l	0.01	4	1	<0.01	0.15	0.0063	h	-	-	-	-	0.0063	4	1					0.15	<0.01	<0.01	<0.01
86-73-7	Fluorene	-	-	1860	µg/l	0.01	4	2	<0.01	0.2	-	-	-	-	-	-	-	-	-					0.2	0.03	<0.01	<0.01
193-39-5	Indeno(1,2,3-cd)pyrene	PHS	H	0.2	µg/l	0.01	4	0	<0.01	<0.01	-	-	-	-	-	-	-	-	-					<0.01	<0.01	<0.01	<0.01
91-20-3	Naphthalene	PS	NP	19000	µg/l	0.01	4	1	<0.01	0.12	2	h	-	-	-	-	2	0	0					<0.01	0.12	<0.01	<0.01
85-01-8	Phenanthrene	-	-	1120	µg/l	0.01	4	2	<0.01	0.59	-	-	-	-	-	-	-	-	-					0.59	0.06	<0.01	<0.01
129-00-0	Pyrene	-	-	130	µg/l	0.01	4	1	<0.01	0.14	-	-	-	-	-	-	-	-	-					0.14	<0.01	<0.01	<0.01
GRP01	PAHs = sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene	PHS	H	-	µg/l	0.04	4	0	<0.04	<0.04	-	-	-	-	-	-	-	-	-					<0.04	<0.04	<0.04	<0.04
P1877	Total Phenols	SP	NP	84100000	µg/l	1	4	3	<1	3.6	7.7	h	-	-	-	-	7.7	0	0					3.6	2.1	<1	2

EQS Assessment Notes	
Surface Water Representative Hardness as mg/l $CaCO_3$	10
PNEC calculated (inland EQS)	

Substance Designation	
EQS Category	
PS	**Priority substance**
PHS	**Priority hazardous substance**
O	Operational
OP	Other Pollutant
SP	Specific Pollutant
JAGDAG Hazardous Substances Determination (UK)	
H	Hazardous substance
NP	Non-hazardous pollutant
(-)	Not included in assessment

Data Sources - DWS (England & Wales)	
a	The Water Supply (Water Quality) Regulations 2016 (Statutory Instrument 2016 No. 614)
b	The Water Supply (Water Quality) Regulations 2018 (Statutory Instrument 2018 No. 647 (Wales 121))
c	As above - pesticides not individually specified
d	DRINKING WATER INSPECTORATE. January 2021. Guidance on the Water Supply (Water Quality) Regulations 2016 specific to PFOS (perfluorooctane sulphonate) and PFOA (perfluorooctanoic acid) concentrations in drinking water.
e	WORLD HEALTH ORGANIZATION. 2021. Guidelines for drinking-water quality (4th Edition incorporating the 1st and 2nd addendum). WHO, Geneva.
Data Sources - RPV (Scotland	
f	Position Statement (WAT-PS-10-01) Assigning Groundwater Assessment Criteria for Pollutant Inputs
Data Sources - EQS England and Wales	
g	The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
h	GOV.UK. April 2018. Surface water pollution risk assessment for your environmental permit. https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit, accessed 18/04/2018.
i	Proposed Environmental Quality Standards for Ethylbenzene in Water, R&D Technical Report P2-115/TR4. EA 2001
j	The Water Supply (Water Quality) Regulations 1989
Data Sources - EQS Scotland	
k	Supporting Guidance (WAT-SG-53) Environmental Quality Standards and Standards for Discharges to Surface Waters
Data Sources - Minimum Reporting Values (MRV) & JAGDAG Determination	
l	GOV.UK.January 2017. Hazardous substances to groundwater: https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values, accessed 22/10/2018.
m	https://www.wfduk.org/tagged/hazardous-substances
Data Sources - SoBRA GWVap	
n	Sobra, 2017. Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater.

Appendix G Waste classification

HazWasteOnline™ assessment

Waste Classification Report

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

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

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

326KZ-0AKH8-8H0RA

Report is invalid if pages are removed.

Job name

Phase 1a Penrhys Village

Description/Comments

Project

Phase 1a Penrhys Village

Site

Penrhys Village, Ferndale

Classified by

Name:
Kurt Gilmore
Company:
Hydrock Consultants Ltd
Date:
04 Apr 2025 10:14 GMT
Telephone:

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: -

Course	Date
Hazardous Waste Classification	08 Sep 2020
3 year Refresher overdue	-

Purpose of classification

2 - Material Characterisation

Address of the waste

Penrhys Village, Ferndale **Post Code** CF43 3RE

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Redevelopment of residential village

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

Waste created during site investigation

Description of the waste

Mixed Made Ground and natural soils.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	BH301	1.85	Non Hazardous		3
2	BH301[2]	3.55	Non Hazardous		4
3	BH301[3]	0.6	Non Hazardous		6
4	BH301[4]	1.1	Non Hazardous		7
5	BH302B	1.1	Non Hazardous		9
6	TP202	0.5	Non Hazardous		11
7	TP207A	0.5	Non Hazardous		13
8	TP207A[2]	1.5	Hazardous	HP 8	15
9	TP208	1	Non Hazardous		16
10	TP101	0.5	Non Hazardous		18
11	BH203	0.8	Non Hazardous		20
12	TP102	1.5	Non Hazardous		22
13	TP103	0.3	Non Hazardous		24
14	TP104A	0.1	Non Hazardous		26
15	TP104A[2]	1	Non Hazardous		28
16	TP105	0.6	Non Hazardous		30
17	TP105[2]	0.9	Non Hazardous		33
18	TP106	0.4	Non Hazardous		35
19	TP107	0.4	Non Hazardous		37
20	TP109	1.2	Non Hazardous		39
21	TP110	1.4	Non Hazardous		41
22	TP111	1.6	Non Hazardous		43
23	TP113	0.05	Non Hazardous		45
24	BH301[5]	1.1	Non Hazardous		47
25	BH301[6]	3.55	Non Hazardous		49
26	BH302B[2]	1.1	Non Hazardous		51
27	TP202[2]	0.5	Non Hazardous		53
28	TP207A[3]	0.5	Non Hazardous		55
29	TP208[2]	1	Non Hazardous		57
30	TP101[2]	0.5	Non Hazardous		59

Related documents

#	Name	Description
1	Hydrock Standard plus Cresol (ammended Lead)	waste stream template used to create this Job

Report

Created by: Kurt Gilmore

Created date: 04 Apr 2025 10:14 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	61
Appendix B: Rationale for selection of metal species	62
Appendix C: Version	63

Classification of sample: BH301

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

Sample details

Sample name:	LoW Code:	
BH301	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.85 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No 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							
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH301[2]

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

Sample details

Sample name:
BH301[2]

Sample Depth:
3.55 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	11.487 mg/kg	0.00115 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6 mg/kg	2.775	4.441 mg/kg	0.000444 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				5.2	mg/kg	1.126	5.855	mg/kg	0.000585 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	2.8	mg/kg		2.8	mg/kg	0.00028 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				42	mg/kg	1.579	66.339	mg/kg	0.00663 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				74	mg/kg	1.245	92.109	mg/kg	0.00921 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0206 %		

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: BH301[3]

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

Sample details

Sample name:
BH301[3]
Sample Depth:
0.6 m

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: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		11.4 pH		11.4 pH	11.4 pH		
								Total:	0%		

Key

	User supplied data
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: BH301[4]

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

Sample details

Sample name:		LoW Code:	
BH301[4]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.18 mg/kg		0.18 mg/kg	0.000018 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.36 mg/kg		0.36 mg/kg	0.000036 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.1 mg/kg		1.1 mg/kg	0.00011 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1 mg/kg		1 mg/kg	0.0001 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.4 mg/kg		1.4 mg/kg	0.00014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.64 mg/kg		0.64 mg/kg	0.000064 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.67 mg/kg		0.67 mg/kg	0.000067 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.69 mg/kg	2.775	1.915 mg/kg	0.000191 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1 mg/kg	13.43	13.43 mg/kg	0.00134 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4 mg/kg	1.285	0.514 mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.3 mg/kg		1.3 mg/kg	0.00013 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.19	mg/kg		0.19	mg/kg	0.000019 %		
19		fluoranthene		205-912-4	206-44-0		2	mg/kg		2	mg/kg	0.0002 %		
20		fluorene		201-695-5	86-73-7		0.2	mg/kg		0.2	mg/kg	0.00002 %		
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.54	mg/kg		0.54	mg/kg	0.000054 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	72	mg/kg		72	mg/kg	0.0072 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.08	mg/kg		0.08	mg/kg	0.000008 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		10	mg/kg	1.579	15.795	mg/kg	0.00158 %		
26		pH			PH		10.8	pH		10.8	pH	10.8 pH		
27		phenanthrene		201-581-5	85-01-8		1.2	mg/kg		1.2	mg/kg	0.00012 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		1.7	mg/kg		1.7	mg/kg	0.00017 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		78	mg/kg	1.245	97.088	mg/kg	0.00971 %		
											Total:	0.0266 %		

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: BH302B

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

Sample details

Sample name:		LoW Code:	
BH302B		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.18	mg/kg		0.18	mg/kg	0.000018 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		37	mg/kg	1.32	48.852	mg/kg	0.00489 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		1.2	mg/kg	0.00012 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.3	mg/kg		1.3	mg/kg	0.00013 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.8	mg/kg		1.8	mg/kg	0.00018 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.73	mg/kg		0.73	mg/kg	0.000073 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.63	mg/kg		0.63	mg/kg	0.000063 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41	mg/kg	2.775	1.138	mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5	mg/kg	13.43	6.715	mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		38	mg/kg	1.462	55.539	mg/kg	0.00555 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.4	mg/kg		1.4	mg/kg	0.00014 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		45	mg/kg	1.126	50.665	mg/kg	0.00507 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.22	mg/kg		0.22	mg/kg	0.000022 %		
19		fluoranthene		205-912-4	206-44-0		1.6	mg/kg		1.6	mg/kg	0.00016 %		
20		fluorene		201-695-5	86-73-7		0.09	mg/kg		0.09	mg/kg	0.000009 %		
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.69	mg/kg		0.69	mg/kg	0.000069 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	110	mg/kg		110	mg/kg	0.011 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.1	mg/kg		0.1	mg/kg	0.00001 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
26		pH			PH		11.2	pH		11.2	pH	11.2 pH		
27		phenanthrene		201-581-5	85-01-8		0.64	mg/kg		0.64	mg/kg	0.000064 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		1.3	mg/kg		1.3	mg/kg	0.00013 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		280	mg/kg	1.245	348.52	mg/kg	0.0349 %		
											Total:	0.0652 %		

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: TP202

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

Sample details

Sample name:	LoW Code:	
TP202	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.5 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.07 mg/kg		0.07 mg/kg	0.000007 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.07 mg/kg		0.07 mg/kg	0.000007 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41 mg/kg	2.775	1.138 mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2 mg/kg	13.43	2.686 mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.13 mg/kg		0.13 mg/kg	0.000013 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8.6	mg/kg	1.126	9.683	mg/kg	0.000968 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	12	mg/kg		12	mg/kg	0.0012 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				8.6	mg/kg	1.579	13.584	mg/kg	0.00136 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				47	mg/kg	1.245	58.502	mg/kg	0.00585 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0133 %		

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: TP207A

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

Sample details

Sample name:
TP207A
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4 mg/kg	1.32	12.411 mg/kg	0.00124 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08 mg/kg		0.08 mg/kg	0.000008 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.08 mg/kg		0.08 mg/kg	0.000008 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.09 mg/kg		0.09 mg/kg	0.000009 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45 mg/kg	2.775	1.249 mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				9.7	mg/kg	1.579	15.321	mg/kg	0.00153 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				11.1	pH		11.1	pH	11.1 pH		
				PH									
27		phenanthrene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				100	mg/kg	1.245	124.471	mg/kg	0.0124 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0217 %		

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: TP207A[2]

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:	LoW Code:	
TP207A[2]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.5 m	Entry:	17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 8: Corrosive "waste which on application can cause skin corrosion"

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH (conc.: 11.6 pH)

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
1	●	pH		PH		11.6 pH		11.6 pH	11.6 pH		
								Total:	0%		

Key

	User supplied data
	Hazardous result
●	Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: TP208

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

Sample details

Sample name:
TP208
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.23 mg/kg		0.23 mg/kg	0.000023 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.41 mg/kg		0.41 mg/kg	0.000041 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.6 mg/kg		0.6 mg/kg	0.00006 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.3 mg/kg		0.3 mg/kg	0.00003 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.19 mg/kg		0.19 mg/kg	0.000019 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.57 mg/kg	2.775	1.582 mg/kg	0.000158 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3 mg/kg	13.43	4.029 mg/kg	0.000403 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.3 mg/kg	1.285	0.386 mg/kg	0.00003 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.37 mg/kg		0.37 mg/kg	0.000037 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.28	mg/kg		0.28	mg/kg	0.000028 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		16	mg/kg	0.0016 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				16	mg/kg	1.579	25.272	mg/kg	0.00253 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				61	mg/kg	1.245	75.928	mg/kg	0.00759 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0186 %		

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: TP101

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

Sample details

Sample name:
TP101
Sample Depth:
0.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		1.3 mg/kg		1.3 mg/kg	0.00013 %		
2	acenaphthylene		205-917-1	208-96-8		0.12 mg/kg		0.12 mg/kg	0.000012 %		
3	anthracene		204-371-1	120-12-7		1.4 mg/kg		1.4 mg/kg	0.00014 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8 mg/kg	1.32	10.563 mg/kg	0.00106 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		6 mg/kg		6 mg/kg	0.0006 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		8.3 mg/kg		8.3 mg/kg	0.00083 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		11 mg/kg		11 mg/kg	0.0011 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		6.1 mg/kg		6.1 mg/kg	0.00061 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		4.1 mg/kg		4.1 mg/kg	0.00041 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.56 mg/kg	2.775	1.554 mg/kg	0.000155 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6 mg/kg	13.43	8.058 mg/kg	0.000806 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	27.77 mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		6.8 mg/kg		6.8 mg/kg	0.00068 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8.5	mg/kg	1.126	9.57	mg/kg	0.000957 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				11	mg/kg		11	mg/kg	0.0011 %		
			205-912-4	206-44-0									
20		fluorene				0.93	mg/kg		0.93	mg/kg	0.000093 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				5.2	mg/kg		5.2	mg/kg	0.00052 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	19	mg/kg		19	mg/kg	0.0019 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				7.1	mg/kg	1.579	11.214	mg/kg	0.00112 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.2	pH		9.2	pH	9.2 pH		
				PH									
27		phenanthrene				5.6	mg/kg		5.6	mg/kg	0.00056 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				9	mg/kg		9	mg/kg	0.0009 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				39	mg/kg	1.245	48.544	mg/kg	0.00485 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0214 %		

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: BH203

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

Sample details

Sample name:
BH203
Sample Depth:
0.8 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	25.086 mg/kg	0.00251 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.23 mg/kg		0.23 mg/kg	0.000023 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.26 mg/kg		0.26 mg/kg	0.000026 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.34 mg/kg		0.34 mg/kg	0.000034 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.16 mg/kg		0.16 mg/kg	0.000016 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.13 mg/kg		0.13 mg/kg	0.000013 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.38 mg/kg	2.775	1.055 mg/kg	0.000105 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6 mg/kg	13.43	8.058 mg/kg	0.000806 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.32 mg/kg		0.32 mg/kg	0.000032 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				16	mg/kg	1.126	18.014	mg/kg	0.0018 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.36	mg/kg		0.36	mg/kg	0.000036 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	26	mg/kg		26	mg/kg	0.0026 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8	pH		8	pH	8pH		
				PH									
27		phenanthrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.34	mg/kg		0.34	mg/kg	0.000034 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				56	mg/kg	1.245	69.704	mg/kg	0.00697 %		
		030-013-00-7	215-222-5	1314-13-2									
31		asbestos				10	mg/kg		10	mg/kg	0.001 %		
		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:	0.02 %		

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: TP102

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

Sample details

Sample name:
TP102
Sample Depth:
1.5 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.7 mg/kg	1.32	8.846 mg/kg	0.000885 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.14 mg/kg		0.14 mg/kg	0.000014 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.1 mg/kg		0.1 mg/kg	0.00001 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.21 mg/kg		0.21 mg/kg	0.000021 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.1 mg/kg		0.1 mg/kg	0.00001 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.1 mg/kg		0.1 mg/kg	0.00001 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.46 mg/kg	2.775	1.277 mg/kg	0.000128 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8 mg/kg	13.43	10.744 mg/kg	0.00107 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.2 mg/kg	1.285	0.257 mg/kg	0.00002 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.28 mg/kg		0.28 mg/kg	0.000028 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				14	mg/kg	1.126	15.762	mg/kg	0.00158 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.29	mg/kg		0.29	mg/kg	0.000029 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	43	mg/kg		43	mg/kg	0.0043 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				10.6	pH		10.6	pH	10.6 pH		
				PH									
27		phenanthrene				0.31	mg/kg		0.31	mg/kg	0.000031 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				94	mg/kg	1.245	117.003	mg/kg	0.0117 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0238 %		

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: TP103

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

Sample details

Sample name:
TP103
Sample Depth:
0.3 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08 mg/kg		0.08 mg/kg	0.000008 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.07 mg/kg		0.07 mg/kg	0.000007 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.13 mg/kg		0.13 mg/kg	0.000013 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.48 mg/kg	2.775	1.332 mg/kg	0.000133 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.7 mg/kg	13.43	9.401 mg/kg	0.00094 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.12 mg/kg		0.12 mg/kg	0.000012 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	19	mg/kg		19	mg/kg	0.0019 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				14	mg/kg	1.579	22.113	mg/kg	0.00221 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
27		phenanthrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				62	mg/kg	1.245	77.172	mg/kg	0.00772 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0187 %		

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: TP104A

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

Sample details

Sample name:
TP104A
Sample Depth:
0.1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.24 mg/kg		0.24 mg/kg	0.000024 %		
2	acenaphthylene		205-917-1	208-96-8		0.09 mg/kg		0.09 mg/kg	0.000009 %		
3	anthracene		204-371-1	120-12-7		0.35 mg/kg		0.35 mg/kg	0.000035 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	22.446 mg/kg	0.00224 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		2.5 mg/kg		2.5 mg/kg	0.00025 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		3.1 mg/kg		3.1 mg/kg	0.00031 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		4.2 mg/kg		4.2 mg/kg	0.00042 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		1.9 mg/kg		1.9 mg/kg	0.00019 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		1.7 mg/kg		1.7 mg/kg	0.00017 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.47 mg/kg	2.775	1.304 mg/kg	0.00013 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.3 mg/kg	13.43	17.459 mg/kg	0.00175 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.6 mg/kg	1.285	0.771 mg/kg	0.00006 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		2.9 mg/kg		2.9 mg/kg	0.00029 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				17	mg/kg	1.126	19.14	mg/kg	0.00191 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.45	mg/kg		0.45	mg/kg	0.000045 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				4	mg/kg		4	mg/kg	0.0004 %		
			205-912-4	206-44-0									
20		fluorene				0.18	mg/kg		0.18	mg/kg	0.000018 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				1.9	mg/kg		1.9	mg/kg	0.00019 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	44	mg/kg		44	mg/kg	0.0044 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				13	mg/kg	1.579	20.533	mg/kg	0.00205 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				6.6	pH		6.6	pH	6.6 pH		
				PH									
27		phenanthrene				1.5	mg/kg		1.5	mg/kg	0.00015 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				3.2	mg/kg		3.2	mg/kg	0.00032 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				69	mg/kg	1.245	85.885	mg/kg	0.00859 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0262 %		

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: TP104A[2]

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

Sample details

Sample name:
TP104A[2]
Sample Depth:
1 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7.4 mg/kg	1.32	9.77 mg/kg	0.000977 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.22 mg/kg		0.22 mg/kg	0.000022 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.3 mg/kg		0.3 mg/kg	0.00003 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.38 mg/kg		0.38 mg/kg	0.000038 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.12 mg/kg		0.12 mg/kg	0.000012 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.17 mg/kg		0.17 mg/kg	0.000017 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.52 mg/kg	2.775	1.443 mg/kg	0.000144 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	6.715 mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.26 mg/kg		0.26 mg/kg	0.000026 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				34	mg/kg	1.126	38.28	mg/kg	0.00383 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	7.6	mg/kg		7.6	mg/kg	0.00076 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				24	mg/kg	1.579	37.908	mg/kg	0.00379 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.3	pH		7.3	pH	7.3 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				73	mg/kg	1.245	90.864	mg/kg	0.00909 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0221 %		

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: TP105

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

Sample details

Sample name:
TP105
Sample Depth:
0.6 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		0.05 mg/kg		0.05 mg/kg	0.000005 %		
3	anthracene		204-371-1	120-12-7		0.17 mg/kg		0.17 mg/kg	0.000017 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.78 mg/kg		0.78 mg/kg	0.000078 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.76 mg/kg		0.76 mg/kg	0.000076 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.99 mg/kg		0.99 mg/kg	0.000099 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.43 mg/kg		0.43 mg/kg	0.000043 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.43 mg/kg		0.43 mg/kg	0.000043 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.55 mg/kg	2.775	1.526 mg/kg	0.000153 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8 mg/kg	13.43	10.744 mg/kg	0.00107 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.7 mg/kg	1.285	0.9 mg/kg	0.00007 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.92 mg/kg		0.92 mg/kg	0.000092 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				42	mg/kg	1.126	47.287	mg/kg	0.00473 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		dibenz[a,h]anthracene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
		601-041-00-2	200-181-8	53-70-3									
19		diesel petroleum group				38	mg/kg		38	mg/kg	0.0038 %		
				68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9									
20		ethylbenzene				<5	mg/kg		<5	mg/kg	<0.0005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
21		fluoranthene				1.5	mg/kg		1.5	mg/kg	0.00015 %		
			205-912-4	206-44-0									
22		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-695-5	86-73-7									
23		indeno[123-cd]pyrene				0.4	mg/kg		0.4	mg/kg	0.00004 %		
			205-893-2	193-39-5									
24		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	63	mg/kg		63	mg/kg	0.0063 %		
		082-001-00-6											
25		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
26		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
27		nickel { nickel dihydroxide }				15	mg/kg	1.579	23.692	mg/kg	0.00237 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
28		pH				9.4	pH		9.4	pH	9.4 pH		
				PH									
29		phenanthrene				0.61	mg/kg		0.61	mg/kg	0.000061 %		
			201-581-5	85-01-8									
30		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		604-001-00-2	203-632-7	108-95-2									
31		pyrene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
			204-927-3	129-00-0									
32		TPH (C6 to C40) petroleum group				83.706	mg/kg		83.706	mg/kg	0.00837 %		
				TPH									
33		zinc { zinc oxide }				170	mg/kg	1.245	211.601	mg/kg	0.0212 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.053 %		

Key

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

Supplementary Hazardous Property Information

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

Force this Hazardous Property to non-hazardous for cumulative determinand results below the threshold of: 500 mg/kg (0.05%) because: Sample is not liquid.

Hazard Statements hit:

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

Because of determinands:

diesel petroleum group (conc.: 0.0038%)
TPH (C6 to C40) petroleum group (conc.: 0.00837%)

Classification of sample: TP105[2]

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

Sample details

Sample name:		LoW Code:	
TP105[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.9 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08 mg/kg		0.08 mg/kg	0.000008 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.08 mg/kg		0.08 mg/kg	0.000008 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.07 mg/kg		0.07 mg/kg	0.000007 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.35 mg/kg	2.775	0.971 mg/kg	0.0000971 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8 mg/kg	13.43	10.744 mg/kg	0.00107 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4 mg/kg	1.285	0.514 mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.14 mg/kg		0.14 mg/kg	0.000014 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				16	mg/kg	1.126	18.014	mg/kg	0.0018 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	31	mg/kg		31	mg/kg	0.0031 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				11	mg/kg	1.579	17.374	mg/kg	0.00174 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.1	pH		9.1	pH	9.1 pH		
				PH									
27		phenanthrene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				64	mg/kg	1.245	79.662	mg/kg	0.00797 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0198 %		

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: TP106

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

Sample details

Sample name:		LoW Code:	
TP106		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.4 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.05 mg/kg		0.05 mg/kg	0.000005 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.5 mg/kg	1.32	12.543 mg/kg	0.00125 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.5 mg/kg	2.775	1.388 mg/kg	0.000139 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.7 mg/kg	13.43	9.401 mg/kg	0.00094 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		11 mg/kg	1.462	16.077 mg/kg	0.00161 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		9	mg/kg	1.126	10.133	mg/kg	0.00101 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	21	mg/kg		21	mg/kg	0.0021 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.05	mg/kg		0.05	mg/kg	0.000005 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
26		pH			PH		10.6	pH		10.6	pH	10.6 pH		
27		phenanthrene		201-581-5	85-01-8		0.07	mg/kg		0.07	mg/kg	0.000007 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		37	mg/kg	1.245	46.054	mg/kg	0.00461 %		
											Total:	0.0136 %		

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: TP107

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

Sample details

Sample name:	LoW Code:	
TP107	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
0.4 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.6	mg/kg	1.32	8.714	mg/kg	0.000871 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.06	mg/kg		0.06	mg/kg	0.000006 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.05	mg/kg		0.05	mg/kg	0.000005 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.1	mg/kg		0.1	mg/kg	0.00001 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.6	mg/kg	2.775	1.665	mg/kg	0.000167 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.8	mg/kg	13.43	10.744	mg/kg	0.00107 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16	mg/kg	1.462	23.385	mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.12	mg/kg		0.12	mg/kg	0.000012 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8.6	mg/kg	1.126	9.683	mg/kg	0.000968 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.1	mg/kg		0.1	mg/kg	0.00001 %		
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	12	mg/kg		12	mg/kg	0.0012 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		24	mg/kg	1.579	37.908	mg/kg	0.00379 %		
26		pH			PH		7.9	pH		7.9	pH	7.9 pH		
27		phenanthrene		201-581-5	85-01-8		0.13	mg/kg		0.13	mg/kg	0.000013 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		0.09	mg/kg		0.09	mg/kg	0.000009 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		57	mg/kg	1.245	70.949	mg/kg	0.00709 %		
											Total:	0.0176 %		

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: TP109

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

Sample details

Sample name:	LoW Code:	
TP109	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.2 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.06 mg/kg		0.06 mg/kg	0.000006 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.4 mg/kg	1.32	11.091 mg/kg	0.00111 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.79 mg/kg	2.775	2.193 mg/kg	0.000219 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6 mg/kg	13.43	8.058 mg/kg	0.000806 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				11	mg/kg	1.126	12.385	mg/kg	0.00124 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	13	mg/kg		13	mg/kg	0.0013 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.06	mg/kg		0.06	mg/kg	0.000006 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				21	mg/kg	1.579	33.169	mg/kg	0.00332 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.2	pH		7.2	pH	7.2 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				56	mg/kg	1.245	69.704	mg/kg	0.00697 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0173 %		

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: TP110

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

Sample details

Sample name:	LoW Code:	
TP110	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.4 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.5 mg/kg	1.32	12.543 mg/kg	0.00125 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.13 mg/kg		0.13 mg/kg	0.000013 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.13 mg/kg		0.13 mg/kg	0.000013 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.23 mg/kg		0.23 mg/kg	0.000023 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.1 mg/kg		0.1 mg/kg	0.00001 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.08 mg/kg		0.08 mg/kg	0.000008 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.39 mg/kg	2.775	1.082 mg/kg	0.000108 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.2 mg/kg	13.43	16.116 mg/kg	0.00161 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.2 mg/kg	1.285	0.257 mg/kg	0.00002 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.28 mg/kg		0.28 mg/kg	0.000028 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12	mg/kg	1.126	13.511	mg/kg	0.00135 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		0.27	mg/kg		0.27	mg/kg	0.000027 %		
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.09	mg/kg		0.09	mg/kg	0.000009 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	14	mg/kg		14	mg/kg	0.0014 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.14	mg/kg		0.14	mg/kg	0.000014 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		9.9	mg/kg	1.579	15.637	mg/kg	0.00156 %		
26		pH			PH		11.4	pH		11.4	pH	11.4 pH		
27		phenanthrene		201-581-5	85-01-8		0.33	mg/kg		0.33	mg/kg	0.000033 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		0.23	mg/kg		0.23	mg/kg	0.000023 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		140	mg/kg	1.245	174.26	mg/kg	0.0174 %		
											Total:	0.0271 %		

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: TP111

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

Sample details

Sample name:	LoW Code:	
TP111	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
1.6 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		7 mg/kg	1.32	9.242 mg/kg	0.000924 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.76 mg/kg	2.775	2.109 mg/kg	0.000211 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	6.715 mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8	mg/kg	1.126	9.007	mg/kg	0.000901 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	8.9	mg/kg		8.9	mg/kg	0.00089 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				32	mg/kg	1.579	50.544	mg/kg	0.00505 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				90	mg/kg	1.245	112.024	mg/kg	0.0112 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0222 %		

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: TP113

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

Sample details

Sample name:
TP113
Sample Depth:
0.05 m

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: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12 mg/kg	1.32	15.844 mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.27 mg/kg		0.27 mg/kg	0.000027 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.37 mg/kg		0.37 mg/kg	0.000037 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.49 mg/kg		0.49 mg/kg	0.000049 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.24 mg/kg		0.24 mg/kg	0.000024 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.2 mg/kg		0.2 mg/kg	0.00002 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.65 mg/kg	2.775	1.804 mg/kg	0.00018 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1.2 mg/kg	13.43	16.116 mg/kg	0.00161 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5 mg/kg	1.285	0.643 mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18 mg/kg	1.462	26.308 mg/kg	0.00263 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.36 mg/kg		0.36 mg/kg	0.000036 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				16	mg/kg	1.126	18.014	mg/kg	0.0018 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.53	mg/kg		0.53	mg/kg	0.000053 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	35	mg/kg		35	mg/kg	0.0035 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				15	mg/kg	1.579	23.692	mg/kg	0.00237 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				6.4	pH		6.4	pH	6.4 pH		
				PH									
27		phenanthrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.42	mg/kg		0.42	mg/kg	0.000042 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				71	mg/kg	1.245	88.375	mg/kg	0.00884 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0229 %		

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: BH301[5]

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

Sample details

Sample name:		LoW Code:	
BH301[5]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		0.18	mg/kg		0.18	mg/kg	0.000018 %		
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.36	mg/kg		0.36	mg/kg	0.000036 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	15.844	mg/kg	0.00158 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.1	mg/kg		1.1	mg/kg	0.00011 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1	mg/kg		1	mg/kg	0.0001 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.4	mg/kg		1.4	mg/kg	0.00014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.64	mg/kg		0.64	mg/kg	0.000064 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.67	mg/kg		0.67	mg/kg	0.000067 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.69	mg/kg	2.775	1.915	mg/kg	0.000191 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		1	mg/kg	13.43	13.43	mg/kg	0.00134 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4	mg/kg	1.285	0.514	mg/kg	0.00004 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.3	mg/kg		1.3	mg/kg	0.00013 %		

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	14.637	mg/kg	0.00146 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.19	mg/kg		0.19	mg/kg	0.000019 %		
19		fluoranthene		205-912-4	206-44-0		2	mg/kg		2	mg/kg	0.0002 %		
20		fluorene		201-695-5	86-73-7		0.2	mg/kg		0.2	mg/kg	0.00002 %		
21		indeno[123-cd]pyrene		205-893-2	193-39-5		0.54	mg/kg		0.54	mg/kg	0.000054 %		
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	72	mg/kg		72	mg/kg	0.0072 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		0.08	mg/kg		0.08	mg/kg	0.000008 %		
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		10	mg/kg	1.579	15.795	mg/kg	0.00158 %		
26		pH			PH		7.7	pH		7.7	pH	7.7 pH		
27		phenanthrene		201-581-5	85-01-8		1.2	mg/kg		1.2	mg/kg	0.00012 %		
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		1.7	mg/kg		1.7	mg/kg	0.00017 %		
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		78	mg/kg	1.245	97.088	mg/kg	0.00971 %		
											Total:	0.0266 %		

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: BH301[6]

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

Sample details

Sample name:	LoW Code:	
BH301[6]	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:		
3.55 m	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.7 mg/kg	1.32	11.487 mg/kg	0.00115 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
8	benzo[ghi]perylene		205-883-8	191-24-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		1.6 mg/kg	2.775	4.441 mg/kg	0.000444 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2 mg/kg	13.43	<2.686 mg/kg	<0.000269 %		<LOD
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		16 mg/kg	1.462	23.385 mg/kg	0.00234 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
16		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		5.2	mg/kg	1.126	5.855	mg/kg	0.000585 %		
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }	006-007-00-5				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
18		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19		fluoranthene		205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20		fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }	082-001-00-6			1	2.8	mg/kg		2.8	mg/kg	0.00028 %		
23		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
24		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25		nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		42	mg/kg	1.579	66.339	mg/kg	0.00663 %		
26		pH			PH		10.8	pH		10.8	pH	10.8 pH		
27		phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		phenol	604-001-00-2	203-632-7	108-95-2		<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
29		pyrene		204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		zinc { zinc oxide }	030-013-00-7	215-222-5	1314-13-2		74	mg/kg	1.245	92.109	mg/kg	0.00921 %		
											Total:	0.0206 %		

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: BH302B[2]

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

Sample details

Sample name:		LoW Code:	
BH302B[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1.1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		0.18 mg/kg		0.18 mg/kg	0.000018 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		37 mg/kg	1.32	48.852 mg/kg	0.00489 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		1.2 mg/kg		1.2 mg/kg	0.00012 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		1.3 mg/kg		1.3 mg/kg	0.00013 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		1.8 mg/kg		1.8 mg/kg	0.00018 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.73 mg/kg		0.73 mg/kg	0.000073 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.63 mg/kg		0.63 mg/kg	0.000063 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41 mg/kg	2.775	1.138 mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.5 mg/kg	13.43	6.715 mg/kg	0.000672 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		38 mg/kg	1.462	55.539 mg/kg	0.00555 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		1.4 mg/kg		1.4 mg/kg	0.00014 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				45	mg/kg	1.126	50.665	mg/kg	0.00507 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				1.6	mg/kg		1.6	mg/kg	0.00016 %		
			205-912-4	206-44-0									
20		fluorene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.69	mg/kg		0.69	mg/kg	0.000069 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	110	mg/kg		110	mg/kg	0.011 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				12	mg/kg	1.579	18.954	mg/kg	0.0019 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				11.2	pH		11.2	pH	11.2 pH		
				PH									
27		phenanthrene				0.64	mg/kg		0.64	mg/kg	0.000064 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				1.3	mg/kg		1.3	mg/kg	0.00013 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				280	mg/kg	1.245	348.52	mg/kg	0.0349 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0652 %		

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: TP202[2]

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

Sample details

Sample name:		LoW Code:	
TP202[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.5 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.1 mg/kg		0.1 mg/kg	0.00001 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14 mg/kg		0.14 mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.07 mg/kg		0.07 mg/kg	0.000007 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.07 mg/kg		0.07 mg/kg	0.000007 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.41 mg/kg	2.775	1.138 mg/kg	0.000114 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.2 mg/kg	13.43	2.686 mg/kg	0.000269 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<**LOD**
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		14 mg/kg	1.462	20.462 mg/kg	0.00205 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.13 mg/kg		0.13 mg/kg	0.000013 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8.6	mg/kg	1.126	9.683	mg/kg	0.000968 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	12	mg/kg		12	mg/kg	0.0012 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				8.6	mg/kg	1.579	13.584	mg/kg	0.00136 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.5	pH		8.5	pH	8.5 pH		
				PH									
27		phenanthrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.13	mg/kg		0.13	mg/kg	0.000013 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				47	mg/kg	1.245	58.502	mg/kg	0.00585 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0133 %		

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: TP207A[3]

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

Sample details

Sample name:		LoW Code:	
TP207A[3]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.5 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
2	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
3	anthracene		204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.4	mg/kg	1.32	12.411	mg/kg	0.00124 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.08	mg/kg		0.08	mg/kg	0.000008 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.08	mg/kg		0.08	mg/kg	0.000008 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.14	mg/kg		0.14	mg/kg	0.000014 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.09	mg/kg		0.09	mg/kg	0.000009 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.45	mg/kg	2.775	1.249	mg/kg	0.000125 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		<0.2	mg/kg	13.43	<2.686	mg/kg	<0.000269 %		<**LOD**
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5	mg/kg	1.285	0.643	mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15	mg/kg	1.462	21.923	mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		<**LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.1	mg/kg		0.1	mg/kg	0.00001 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				18	mg/kg	1.126	20.266	mg/kg	0.00203 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	20	mg/kg		20	mg/kg	0.002 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				9.7	mg/kg	1.579	15.321	mg/kg	0.00153 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				11.1	pH		11.1	pH	11.1 pH		
				PH									
27		phenanthrene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
30		zinc { zinc oxide }				100	mg/kg	1.245	124.471	mg/kg	0.0124 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0217 %		

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: TP208[2]

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

Sample details

Sample name:		LoW Code:	
TP208[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
1 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
2	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
3	anthracene		204-371-1	120-12-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11 mg/kg	1.32	14.524 mg/kg	0.00145 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		0.23 mg/kg		0.23 mg/kg	0.000023 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		0.41 mg/kg		0.41 mg/kg	0.000041 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		0.6 mg/kg		0.6 mg/kg	0.00006 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		0.3 mg/kg		0.3 mg/kg	0.00003 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		0.19 mg/kg		0.19 mg/kg	0.000019 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.57 mg/kg	2.775	1.582 mg/kg	0.000158 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.3 mg/kg	13.43	4.029 mg/kg	0.000403 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.3 mg/kg	1.285	0.386 mg/kg	0.00003 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		15 mg/kg	1.462	21.923 mg/kg	0.00219 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8 mg/kg	1.923	<3.462 mg/kg	<0.000346 %		<LOD
15	chrysene	601-048-00-0	205-923-4	218-01-9		0.37 mg/kg		0.37 mg/kg	0.000037 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				21	mg/kg	1.126	23.644	mg/kg	0.00236 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				0.21	mg/kg		0.21	mg/kg	0.000021 %		
			205-912-4	206-44-0									
20		fluorene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				0.28	mg/kg		0.28	mg/kg	0.000028 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	16	mg/kg		16	mg/kg	0.0016 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				16	mg/kg	1.579	25.272	mg/kg	0.00253 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
27		phenanthrene				0.07	mg/kg		0.07	mg/kg	0.000007 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				61	mg/kg	1.245	75.928	mg/kg	0.00759 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0186 %		

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: TP101[2]

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

Sample details

Sample name:		LoW Code:	
TP101[2]		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:			
0.5 m		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	acenaphthene		201-469-6	83-32-9		1.3	mg/kg		1.3	mg/kg	0.00013 %		
2	acenaphthylene		205-917-1	208-96-8		0.12	mg/kg		0.12	mg/kg	0.000012 %		
3	anthracene		204-371-1	120-12-7		1.4	mg/kg		1.4	mg/kg	0.00014 %		
4	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8	mg/kg	1.32	10.563	mg/kg	0.00106 %		
5	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		6	mg/kg		6	mg/kg	0.0006 %		
6	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		8.3	mg/kg		8.3	mg/kg	0.00083 %		
7	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		11	mg/kg		11	mg/kg	0.0011 %		
8	benzo[ghi]perylene		205-883-8	191-24-2		6.1	mg/kg		6.1	mg/kg	0.00061 %		
9	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		4.1	mg/kg		4.1	mg/kg	0.00041 %		
10	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.56	mg/kg	2.775	1.554	mg/kg	0.000155 %		
11	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		0.6	mg/kg	13.43	8.058	mg/kg	0.000806 %		
12	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.5	mg/kg	1.285	0.643	mg/kg	0.00005 %		
13	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19	mg/kg	1.462	27.77	mg/kg	0.00278 %		
14	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.8	mg/kg	1.923	<3.462	mg/kg	<0.000346 %		**<LOD**
15	chrysene	601-048-00-0	205-923-4	218-01-9		6.8	mg/kg		6.8	mg/kg	0.00068 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		copper { dicopper oxide; copper (I) oxide }				8.5	mg/kg	1.126	9.57	mg/kg	0.000957 %		
		029-002-00-X	215-270-7	1317-39-1									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
18		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
19		fluoranthene				11	mg/kg		11	mg/kg	0.0011 %		
			205-912-4	206-44-0									
20		fluorene				0.93	mg/kg		0.93	mg/kg	0.000093 %		
			201-695-5	86-73-7									
21		indeno[123-cd]pyrene				5.2	mg/kg		5.2	mg/kg	0.00052 %		
			205-893-2	193-39-5									
22		lead { lead compounds with the exception of those specified elsewhere in this Annex }			1	19	mg/kg		19	mg/kg	0.0019 %		
		082-001-00-6											
23		mercury { mercury dichloride }				<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
		080-010-00-X	231-299-8	7487-94-7									
24		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
25		nickel { nickel dihydroxide }				7.1	mg/kg	1.579	11.214	mg/kg	0.00112 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
26		pH				9.2	pH		9.2	pH	9.2 pH		
				PH									
27		phenanthrene				5.6	mg/kg		5.6	mg/kg	0.00056 %		
			201-581-5	85-01-8									
28		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
29		pyrene				9	mg/kg		9	mg/kg	0.0009 %		
			204-927-3	129-00-0									
30		zinc { zinc oxide }				39	mg/kg	1.245	48.544	mg/kg	0.00485 %		
		030-013-00-7	215-222-5	1314-13-2									
										Total:	0.0214 %		

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

pH (CAS Number: PH)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

diesel petroleum group (CAS Number: 68334-30-5, 68476-34-6, 94114-59-7, 1159170-26-9)

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 , Skin Irrit. 2; H315 , Acute Tox. 4; H332 , Carc. 2; H351 , Asp. Tox. 1; H304 , STOT RE 2; H373 , 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

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

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

beryllium {beryllium oxide}

Worst case species based on hazard statements

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

Worst case species based on hazard statements

cadmium {cadmium sulfide}

Worst case species based on hazard statements

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Worst case species based on hazard statements

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

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

Worst case species

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

Worst case species based on hazard statements

mercury {mercury dichloride}

Worst case species based on hazard statements

nickel {nickel dihydroxide}

Worst case species based on hazard statements

zinc {zinc oxide}

Worst case species based on hazard statements

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2025.93.6554.11921 (03 Apr 2025)
HazWasteOnline Database: 2025.93.6554.11921 (03 Apr 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
GB MCL List v6.0 - version 6.0 of 15th February 2025

Appendix H Preliminary geotechnical risk register

Geotechnical Hazard Identification – Following Ground Investigation

The preliminary Geotechnical Risk Register following Ground Investigation is set out in Table H.3.

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

Table H.1: Qualitative assessment of hazards and risks

P = probability		I = impact		R = risk rating (P x I)	
1	Very unlikely	1	Very low	1-4	None/negligible
2	Unlikely	2	Low	5-9	Minor
3	Plausible	3	Medium	10-14	Moderate
4	Likely	4	High	15-19	Substantial
5	Very likely	5	Very high	20-25	Severe

Table H.2: Preliminary geotechnical risk register

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
Uncontrolled Made Ground (variable strength and compressibility).	There is Made Ground due to demolition and historical activity at the site.	Residential Dwellings.	Bearing capacity failure, settlement (total and differential).	3	4	12	Design foundations to found below Made Ground or on Made Ground which has been improved.
			Floor slab failure.	3	4	12	Design floor slabs as suspended.
		Roads and Pavements.	Settlement (total and differential) of roads and pavements.	2	2	4	Design roads and pavements using suitable geotechnical parameters.
		Services.	Settlement (differential), causing damage to services.	1	2	2	Anticipated settlements are unlikely to be significant with regard to services. There is a requirement to improve the Made Ground prior to installation of services.
		Gardens.	Settlement (differential), in gardens.	1	2	2	It is unlikely that settlements will be significant with regard to gardens.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavation and replacement with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Table continues:							
Variable lateral and vertical	The Made Ground soils	Residential Dwellings.	Foundation bearing capacity failure,	2	4	8	Design foundations to found below Made Ground or on Made Ground which has been improved.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
changes in ground conditions.	vary laterally and vertically, both in composition and strength.		settlement (total and differential).				
			Floor slab failure.	2	4	8	Design floor slab as suspended.
		Roads and Pavements.	Settlement (total and differential), of roads and pavements.	2	3	6	Design roads and pavements using suitable geotechnical parameters and increase the sub-base and use geo-grids as appropriate. If anticipated settlements are significant, and cannot be mitigated by design, over-excavate and replace unsuitable soils.
		Services.	Settlement (differential), causing damage to services.	1	3	3	Settlements are not anticipated to be significant with regard to services. No additional design requirements envisaged.
		Gardens.	Settlement (differential), in gardens.	1	3	3	It is unlikely that settlements will be significant with respect to gardens.
		Construction staff, vehicles and plant operators.	Trafficking of the site in temporary conditions. Overturning of plant during construction.	2	3	6	Where soft spots encountered, over-excavate and replace with suitable fill. Site inspection and watching brief by Contractor to review working platform frequently and regularly.
Sulfates present in the soils.	The ground investigation has proven that there is the	Attack of buried concrete.	Damage to concrete and reduction in strength.	3	4	12	Design concrete according to BRE sulfate classification of Made Ground.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
	potential for sulfate bearing soils to be present.						
Obstructions.	Obstructions have been proven by the investigation and there is a potential for additional obstructions to be present due to historical construction activity, or unknown fill in Made Ground.	Construction staff, vehicles and plant operators.	Risk of collapse of excavation as obstructions are pulled out.	3	3	9	Allow for a breaker to be present during construction and remove obstructions where encountered during construction.
		Roads and Pavements.	Hard spots in externals and roads / pavements.	3	2	6	
Table continues:							
Slope stability issues – General Slopes.	The site is on sloping ground and the proposed	Residential Dwellings.	Serviceability issues.	2	4	8	Safe slope angles to be assessed during design. Engineered fill requirements to be defined at outline design stage. Drainage requirements to be assessed during design.
		Roads and Pavements.	Serviceability issues.	2	3	6	

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
	development requires slopes to be formed as part of the cut to fill.	Gardens.	Serviceability issues.	1	2	2	Slopes to be constructed at a safe angle.
Slope stability issues – retaining walls.	The site is on sloping ground and the proposed development requires removal and replacement of existing retaining walls	Residential Dwellings.	Serviceability issues.	2	4	8	Design of the retaining to be undertaken in accordance with EC7. Adequate drainage to be designed behind the structure, or for water seepage through the face of the wall. Lateral earth pressure parameters to be characterised during investigation and design.
		Pavement construction and long-term durability highways and external areas.	Serviceability issues.	2	3	6	
		Gardens.	Serviceability issues.	1	2	2	
Table continues:							
Unforeseen ground conditions - risk associated with limited data.	Ground investigation has been undertaken. However, additional	All aspects of the development.		3	4	12	Designers to be contacted if conditions encountered are different to those identified during investigation. Regular inspections of excavations and earthworks for evidence of stability.

Hazard	Comments	Who is at Risk	Consequence	Risk Before Mitigation			Actions Required
				P	I	R	
	information will be obtained during construction. Ground conditions are only defined at exploratory hole locations.						Adequate investigation required to characterise the site and understand the potential risks.

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

Impacts of the design with regard to health and Safety considerations will need to be included by the designer at design stage.

Appendix I Plausible source-pathway-receptor contaminant linkages

Summary of potential contaminant linkages

Table I.2 lists the plausible contaminant linkages which have been identified. These are considered as potentially unacceptable risks in line with guidelines published in LCRM (2023) where the risk is moderate or above, and additional risk assessment is required to resolve these linkages.

Source – Pathway – Receptor Linkages have been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) as modified to reflect changes made in Table A4.5 of NHBC/EA R&D66 (2008), to add a 'no linkage' category, to remove the ambiguous term "low/moderate risk", and to adopt "Extremely low risk" for the lowest risk category in order to differentiate it from the other 'very low' categories that are associated with higher probability and/or consequence. (See Table I.1).

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

Table I.1.: Consequence versus probability assessment

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Low risk
	Low likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Extremely low risk
	No linkage	No risk			

Table I.2. Source-pathway-receptor contaminant linkages

Source	Possible pathway(s)	Receptor	Probability	Consequence	Risk level	Comments
Made Ground containing elevated concentrations of PAH and asbestos containing materials	Direct ingestion of soil Ingestion of soil attached to fruit/vegetables Ingestion of fruit/vegetables Dermal contact with dust derived from soil	Site users	Likely	Medium	Moderate	The proposed development comprises low-rise residential housing with private gardens and therefore all potential pathways will be active for human health. Contact with Made Ground materials is likely in gardens and areas of Public Open Space. Mitigation measures will be required to break the SPR linkage (e.g. removal of Made Ground or placement of engineered cover system)
	Inhalation of soil derived dust (outdoors)	Site end users	Unlikely	Mild	Very low	The risk of significant generation of dust is likely only during site development process and can therefore be controlled using good construction environmental management practices
	Inhalation of soil derived dust (indoors)	Neighbours	Low likelihood	Mild	Low	
	Dissolved phase leaching from unsaturated soils	Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability	Likely	Mild	Low	Testing indicates moderate leachability of contaminants. Due to poor quality of groundwater as per NRW records, consequence is considered to be mild.

Source	Possible pathway(s)	Receptor	Probability	Consequence	Risk level	Comments
	Lateral migration of dissolved phase in groundwater	Groundwater: Rhondda Member Secondary A Aquifer of high vulnerability	Likely	Mild	Low	Testing indicates moderate leachability of contaminants. Due to poor quality of groundwater as per NRW records, consequence is considered to be mild.
	Vertical migration of dissolved phase in groundwater		Likely	Mild	Low	
	Groundwater baseflow to surface water	Surface water: River Rhondda and Afon Rhondda Fach	Likely	Mild	Low	
	Surface water run-off	Surface water: River Rhondda and Afon Rhondda Fach	Low likelihood	Medium	Low	
	Surface water drainage discharge	Surface water: River Rhondda and Afon Rhondda Fach	Likely	Medium	Moderate	

Source	Possible pathway(s)	Receptor	Probability	Consequence	Risk level	Comments
Asbestos within existing buildings/structures	Inhalation of fugitive dust	Site end users	Unlikely	Severe	Low	The risk of significant generation of dust is likely only during site development process and can therefore be controlled. Suppression should be included in control measures. There is ACM present on the wider site that may also be present (also to date undiscovered) in the Phase 1a site, so works to be undertaken in accordance with CAR 2012.
		Construction workers	Likely	Severe	High	
		Neighbours	Low likelihood	Severe	Moderate	
Fly-tipped waste potentially including solvents, metals, metalloids, asbestos and asbestos containing materials	Inhalation of fugitive dust	Site end user	Unlikely	Severe	Low	
		Neighbours	Low likelihood	Severe	Moderate	
		Construction workers	Likely	Severe	High	
Ground gases from the decomposition of organic matter within the Made Ground	Vertical migration and ingress into buildings	On-site buildings and site users	Unlikely	Medium	Very low	No significant ground gas source was identified in the investigation. Post-field work monitoring did not encounter methane above 3% or Carbon dioxide above 5%. No flow was recorded. No ground gas protection measures required.

Appendix J Climate change considerations for CSM

Climate change considerations for the CSM

Table J1 summarises the considerations that have been made in relation the possible implications of predicted climate change. These considerations have been made with reference to prevailing guidance on climate change and land contamination (SoBRA (2022), CL:AIRE (2022), Environment Agency (2010)), and climate change information published by the Met Office and the NRW.

Table J.1 Climate change considerations for CSM

Climate change type	Potential climate change induced effect	Possible considerations on CSM
Increase in frequency and severity of extreme cold and hot weather events	Soil freezing	Could cause failure of surface water drainage network (requiring repair) due to freeze/thaw action but not evident that this would cause a significant change to identified contaminant linkages.
	Soil desiccation/shrinkage	Relatively granular nature of Made Ground deposits and weathered bedrock does not suggest a risk from shrinkage-related subsidence.
	Land fires	Not relevant to current nature and location of site.
	Temporary drop in water (GW and/or SW) levels due to increased water abstraction demand	Underlying shallow aquifer does not have any licenced abstractions registered within 1km of the site. Impact of a drop in water levels in the Sandstone Aquifer not expected to adversely affect identified contaminant linkages.
	Temporary drop in water levels (GW and/or SW) due to lower rainfall.	Drier soils may lead to increased contaminant volatility within the Made Ground with less dilution of contaminants occurring. Likely to pose an increased risk to housing although identified volatile contaminants are limited on the site.

Climate change type	Potential climate change induced effect	Possible considerations on CSM
Long-term decrease in rainfall	Decrease in groundwater levels	See comment above for temporary decrease in groundwater levels above. Whilst it is expected that there will be an increase in winter rainfall it is also expected that there will be a reduction in summer rainfall such that there will be a long-term decrease in the expected seasonal fluctuation in shallow groundwater depth. The impact of long-term rainfall decrease relates not only to contaminant mobility and volatility but also reduces the effect of contaminant dilution within the groundwater body and surface waters.
Long-term change in seasonal temperatures	Change in soil temperature	Worst-case (RCP8.5) prediction for average summer temperatures in 2060-2080 in this area is 2-4 degrees Celsius. Soil temperature at depth below the site (considering the surface cover of buildings and concrete hardstanding) is not expected to rise by this amount and may see a much smaller rise in average temperature as a result of seasonal variation in temperature. A small increase in average soil temperature is not expected to have a significant effect on contaminant fate and transport