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N – Ground Investigation Factual Report

Goat Mill Road – Merthyr Tydfil

784-B077402





Factual Ground Investigation Report

Draft Issue V5

Merthyr Tydfil County Borough Council

October 2026

Document prepared by Tetra Tech Limited. Registered in England number: 03050297

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AOD	above Ordnance Datum
Bgl	below ground level
BGS	British Geological Survey
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C4SL	Category 4 Screening Levels
CIEH	Chartered Institute of Environmental Health
CLEA	Contaminated Land Exposure Assessment
CoC	Constituent of Concern
CSM	Conceptual Site Model
DEFRA	Department of Environment, food and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
DTS	Desktop Study
DRO	Diesel Range Organics
DWS	Drinking Water Standard
EA	Environment Agency (England)
EPH	Extractable Petroleum Hydrocarbons
EQS	Environmental Quality Standards
FOC	Fraction Organic Carbon
GPR	Ground Penetrating Radar
LOD	Limit of detection
LQM	Land Quality Management
NRW	Natural Resources Wales
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PPE	Personal Protection Equipment
Ppm	parts per million
PRO	Petroleum Range Organics
SGV	Soil Guideline Values
SOM	Soil Organic Matter
SVOC	Semi-volatile organic compounds
TPH	Total Petroleum Hydrocarbon
TSV	Tier 1 Screening Values
VOC	Volatile Organic Carbon
VPH	Volatile Petroleum Hydrocarbons

1.0 INTRODUCTION

1.1 INSTRUCTION

Tetra Tech Ltd (Tetra Tech) was commissioned by Merthyr Tydfil County Borough Council (the client) to undertake a Ground Investigation for a site known as Goat Mill Road – Merthyr Tydfil (known hereafter as "the site").

The location of the site is shown on Figure 1, which is appended to the figures section of the report.

1.2 BRIEF

The brief was to provide an intrusive ground investigation which is required to support the discharge of planning conditions associated with land contamination, to allow the discharge of geotechnical risk and to provide information for the detailed design of the site infrastructure. The scope of the investigation has been informed by WSP, following a Desktop Study undertaken by WSP which was provided to Tetra Tech in the Preconstruction Information Pack (UK0041132.2017-WSP-GE-PCI-001) dated September 2025.

The works were designed to comprise of the following elements and are outlined within the WSP Ground Investigation Specification dated September 2025 (UK0041132.2017-GISpec):

- 16 No. Rotary boreholes (BH101-116) to 30m bgl to investigate ground conditions and investigate the presence of mine workings at greater depths with regular SPT intervals taken at 0.5m below the base of the inspection pit, and thereafter at 1.0 metre depth intervals to 5m bgl then at 1.5m depth intervals thereafter.
- 7 No. Cable Percussive boreholes (BH201-207) to 20m bgl to investigate ground conditions within proposed development plots with regular SPT intervals taken at 0.5m below the base of the inspection pit, and thereafter at 1.0 metre depth intervals to 5m bgl then at 1.5m depth intervals thereafter.
- 8 No. Cable Percussive Boreholes (BH301-308) to 7.50m bgl to investigate ground conditions for site infrastructure with regular SPT intervals taken at 0.5m below the base of the inspection pit, and thereafter at 1.0 metre depth intervals to 5m bgl then at 1.5m depth intervals thereafter.
- 2 No. Cable Percussive Boreholes (BH401 and BH402) to 8.0m bgl to investigate ground conditions for site infrastructure with regular SPT intervals taken at 0.5m below the base of the inspection pit, and thereafter at 1.0 metre depth intervals to 5m bgl then at 1.5m depth intervals thereafter.
- 15 No. Machine dug trial pits (TP501-515) with a target depth of 2.0m bgl to investigate ground conditions/contamination within proposed development plots, with soakaway testing undertaken to BRE365.
- 15 No. Machine dug trial pits (TP601-TP615) with a target depth of 4.0m bgl to investigate ground conditions for site infrastructure and undertake plate load tests at 0.50m and 1.00m bgl.
- 6 No. Machine dug trial pits (TP701-TP706) with a target depth of 0.50m bgl to investigate ground conditions with soakaway testing undertaken to BRE365.
- 1 No. Machine dug trial pit (TP801) with a target depth of 1.00m bgl investigate ground conditions with soakaway testing undertaken to BRE365.

- 10 No. Variable Head Permeability Tests (BH102, BH112, BH115, BH203, BH308) at depths to be specified dependent on observed ground conditions.
- Laboratory testing of soil samples to determine geotechnical parameters.
- Laboratory testing of soil samples to determine environmental chemical composition of soils for geo-environmental assessment, waste classification and aggressivity.
- Laboratory testing of surface water samples and groundwater samples to determine environmental chemical composition for geo-environmental assessment.
- Ground gas and groundwater monitoring of installations.
- Preparation of a Factual Ground Investigation report.

The specification of works was completed in accordance with ICE specification for ground investigation and the works themselves be completed in general accordance with the principles set out in BS EN 1997-2:2007 and with the general practice described in BS5930:2015. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175+A1:2017.

1.3 PROPOSED DEVELOPMENT

At the time of writing the report Tetra Tech have not been provided with a proposed development plan. However, based on the WSP UK Ltd Desktop Study ('UK-70116992-DS' dated October 2024), it is understood that the proposed development comprises of a central spine road with commercial units aligned to the east and west with associated access roads. A drainage system comprising of swales alongside the site roads, with attenuation ponds located to the north and south of the site are also proposed. Access to the new development is proposed to be located at the north and west of the site.

1.4 REPORT SCOPE

This report includes the following key elements:

- Full factual records of the site works carried out.
- Summary of the ground conditions encountered.
- In-Situ testing results.
- Environmental laboratory testing results.
- Geotechnical laboratory testing results.

The Factual Ground Investigation Report has been provided to WSP to inform both geotechnical and geo-environmental information aspects, which will be used to address the risks identified within the Desk Study and Coal Mining Risk Assessment (CMRA). The results of the investigation will inform the detailed design of the site infrastructure by defining ground conditions at the site, geotechnical material parameters, allowing the development of a robust Conceptual Ground Model, and identify and mitigate both geotechnical and geo-environmental risk.

1.5 LIMITATIONS

The recommendations and opinions expressed in this report are based on information obtained as part of the desk study or provided by others. Information provided from other sources is taken in good faith and Tetra Tech cannot guarantee its accuracy.

This report is subject to the report conditions presented in Appendix A. The information contained in this report is intended for the use of the Merthyr Tydfil County Borough Council and their agents. Tetra Tech can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.

2.0 SITE INFORMATION

2.1 LOCATION

The site is located in the Dowlais area of Merthyr Tydfil. The site is approximately 14ha in area and is centred on National Grid Reference (NGR) 306239, 206997.

The approximate site address is: Goat Mill Road, Dowlais, Merthyr Tydfil CF48 3TD with centre of the site being approximately situated on what3words ///parent.hope.spike.

A site location plan is presented in Figure 1.

2.2 SITE DESCRIPTION

The site is an open plot of land which lies wholly between the A4102 (Goat Mill Road) and the A4060 dual carriageway, and is bounded by the following, outlined in Table 2-1.

Table 2-1 - Surrounding land uses

Direction	Description
North	Immediately north is an unnamed road, across which are industrial and commercial buildings along Goat Mill Road. A single span concrete bridge leads from the unnamed road to site.
East	Along the eastern boundary is a steep embankment which is vegetated with tree cover with the A4060 dual carriageway with Ffos-Y-Fran situated beyond.
South	To the south of site are residential properties.
West	Immediately west is the A4102/Goat Mill Road across which are industrial buildings, residential properties and the grass sports fields of Oval Playing Fields. The western boundary of the site is comprised of wooded mature trees, which is intersected with a gated access point (what3words: ///wheels.roses.towns).

The site is located east of Goat Mill Road and the A4102 and west of the A4060 dual carriageway. The site is bound to the north by an access road to Phoenix Industrial Estate, and residential properties of Mount View to the south. The site is known to be subject to former industrial and mining activities, most recently opencast workings.

The site generally comprises open, sparsely grassed gravel, with a wooded margin along the western and eastern edges and pockets of dense vegetation growth scattered throughout. Two watercourses are located on site. One is located towards the northern extent of site and the other is located towards the southern side of site. Based on OS Maps, the site is typically shown to decrease in elevation from west to east, from approximately 282m to 279m Above Ordnance Datum (AOD), and decrease from north to south, from approximately 288m to 278m AOD.

There is an unnamed watercourse, which runs along a significant length of the northern site boundary. At its downstream point it exits the site via a culvert under Goat Mill Road. Its upstream channel is partly fed by an off-site culvert, which passes through the base of an embankment that carries the A4046. There is a second unnamed watercourse, of lesser flow, which exits the site in the southwestern part of the site, and

this also utilises a culvert passing beneath Goat Mill Road. The land is used by local residents for dog walking and similar activities.

2.3 GEOLOGY, HYDROGEOLOGY, HYDROLOGY AND RADON

2.3.1 Geology

Details of the geology underlying the site have been obtained from the following sources:

- British Geological Survey (BGS) GeoIndex
- BGS (1979) 1:50,000 scale solid and drift geological map of Merthyr Tydfil (Sheet 231)
- BGS (1972) 1:10,560 scale solid and drift geological map SO00NE
- BGS Online Lexicon – accessed 8th May 2026
- Geology of the South Wales Coalfield, Part V, the country around Merthyr Tydfil. Memoir for 1:50 000 geological sheet 231 (England and Wales)

2.3.2 Made Ground / Artificial Ground

The available geological mapping suggests Made Ground consisting of spoil from coal and iron workings covers much of the site and surrounding area. The BGS Geoindex, indicates that the Made Ground is an Artificial Deposit. The BGS mapping defines Artificial Ground as *'the term used for those areas where the ground surface has been significantly modified by human activity'*

There is an area, labelled 'Many Bell Pits', shown on the western boundary, on the geological mapping where Made Ground is absent. Though not labelled 'Many Bell Pits', a similar outlined area of land on BGS Geoindex also shows Made Ground to be absent. Colliery spoil and backfill is likely to be highly variable in composition, comprising a range of clast sizes with the high potential of comprising anthropogenic material.

2.3.3 Superficial Deposits

Till (Devensian – Diamicton) deposits (shown within Figure 3) are shown to be present underlying the site. Typically, these deposits are described as *'unsorted and unstratified drift, generally overconsolidated, deposited directly by and underneath a glacier without subsequent reworking by water from the glacier. It consists of a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape.'*

It should be noted that available mapping sources show discrepancies in the lateral extent and presence of Glacial Till on site. Where there are discrepancies within the published geological sources, the figures presented in this report are based on the current BGS mapping.

Whilst the BGS mapping indicates that superficial deposits are present to underly the site, these are likely to have been removed and replaced by opencast mining and subsequent restoration within the site footprint.

2.3.4 Solid Geology

BGS mapping indicates that the solid geology underlying the site is comprised of Lower Coal Measure Formation (shown within Figure 4). The BGS lexicon defines its lithological description as *'Grey, (productive) coal-bearing mudstones/siltstones, with seatearths and minor sandstones.'* Geological maps also indicate presence of Ironstone Veins.

The published geology shows the regional geology to dip 6° to the southeast. Inferred on the geological maps is the northwest to southeast trending Dowlais Fault, with the downthrown side towards the southwest. This is the closest mapped fault to site and is approximately 200m to the north. When looking at the 1:10,560 SO00NE geological map suggests the Penydarren Fault and an unlabelled fault are approximately 750m and 500m to the southeast of site respectively. The Penydarren Fault is shown to have a downthrow towards the northeast, the unlabelled fault has a downthrow towards the southwest.

2.3.5 Hydrogeology

The bedrock deposits are designated as a Secondary A Aquifer. The BGS defines these as *'comprise permeable layers that can support local water supplies and may form an important source of base flow to rivers.'*

The superficial deposits are designated as Secondary (Undifferentiated). The BGS defines these as *'aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value.'*

The site is not located within a Source Protection Zone (SPZ), with no SPZ present within 1km of the site.

2.3.6 Hydrology

Details of the hydrology of the area have been obtained from the following sources:

- Environmental database (Groundsure™).
- Natural Resources Wales Interactive Map – accessed 6th May 2026
- WSP Desktop Study 'UK-70116992-DS' dated October 2024 supplied within Preconstruction Information Pack (UK0041132.2017-WSP-GE-PCI-001)

Drainage ditches are located towards the northern extent and the south side of site. A single span concrete bridge crosses the drainage ditch on the south side. A precast concrete bridge culvert crosses the drainage ditch on the northern side. No flow was noted in the drainage ditches during the site walkover; however small body of stagnant water was present within the northern ditch. Surface water features within 500m of the site include:

- A drainage ditch along the A4060, 120m east of the site, which links to three culvert openings which pass beneath the A4060 road embankment and when wet direct surface water westward toward the site. It is postulated that at least one of the most southernly set of culverts (they are positioned within 30m of each other) drain beneath the site in culvert.
- A complex of three ponds, 1 larger and two smaller ponds are found 280m east of the site.
- A pond is located 450m southeast of the site.
- An unnamed surface watercourse passing 80m south of the site.
- A large body of water is present approximately 1.4km east of the Site. This body of water is located within the former Ffos-y-Fran opencast coal mine, that was closed in November 2023.

The River Taff is located approximately 1,400m southwest to the site.

There are no surface water abstractions recorded within 1km of the site.

2.3.7 Radon

The site is shown on the UK Health Security Agency UK maps of radon and is shown as being within the lowest band of radon potential, less than 1% of homes at or above the Action Level.

2.4 SUMMARY OF SITE HISTORY

The following review is based on past editions of readily available Ordnance Survey (OS) maps and obtained from a Groundsure Report (Ref.WSP-PT5-U7G-NVJ-D4M) which is presented in Appendix E of the Preconstruction information provided to Tetra Tech. A full comprehensive site history review is presented within WSP desktop study (ref. UK-70116992-DS).

These include scales of 1:1,250, 1:2,500 and 1:10,000 dated 1884 to 1994 with details changes documented within tables 2-2 and 2-3 below:

Table 2-2: Historical Site Uses

On-site Land Use and Features	Dates
The site is part of the wider Dowlais Great Tip with associated infrastructure including buildings, roads and a railway across site. Various ponds, pits and a reservoir fed by a watercourse that crosses the southern area of the site. Evidence of bell pitting in the southwestern portion of the site. Air shafts located in the centre of site.	1840s-1890s
Expansion of the railways on site. Air shafts indicated to have been abandoned. Some areas of site turned to rough pasture.	1888-1915
Earthworks associated with the former Dowlais Great Tip present. Railway Tracks no longer present on site.	1937-1961
Several ponds and a Sinks are shown onsite. There are 'Ruin' buildings labelled in the northwestern part of the site and towards the eastern extent. One of the two Old Air Shafts is no longer shown.	1944-1973
Majority of the site comprises an opencast mine, an unquarried margin to the north of the railway line comprises numerous ponds.	1988
Site appears to be flat with open sparsely grassed gravel. A wooded margin is present along the western and eastern edges of the site. Opencast mine has been infilled.	2001

Table 2-3 Historical Neighbouring Site Uses

Surrounding Land Uses (250m radius)	Dates	
	From	To
Dowlais Great Tip extends beyond the northeastern boundary of site. Iron works, brick works, steel works surround site. Evidence of ongoing mine across entire surrounding area.	1840s	1890s

Most mining features no longer labelled, within many pits locally becoming disused.	1892	1914
The Brick works, iron works and steel works no longer present on maps. Other industrial premises present across local area. Premises include bakeries, factories and undifferentiated works and depots within former Dowlais iron works. A4060 has been constructed east of site.	1919	1973
Residential properties to the west and south of site are built. Fros -y-Fran opencast mine opens in 2008.	1973	Present

3.0 SITE INVESTIGATION

The site investigation was undertaken between the months of May and June within 2026 and comprised of the following:

- Mobilisation of the site compound occurred between 4th March 2026 and 6th March 2026
- The main site investigation was undertaken between 9th March 2026 and 11th May 2026.
- Following the completion of the main investigation works Tetra Tech were instructed to undertake twenty-four rotary open boreholes between 11th May 2026 and 20th May 2026 to investigate geophysical site anomalies identified during the Geophysical Survey undertaken by TerraDat (Ref. TD9740 Goat Mill Road).
- Demobilisation of the site compound and reinstatement of the site occurred between 21st May and 4th June 2026.

Upon completion of all boreholes, locations were backfilled in accordance with the Ground investigation Specification. At locations requiring installations, the construction details were provided by the WSP Investigation Supervisors

Details of the fieldwork methods are given in the notes section at the end of this report.

3.1 SCOPE OF WORKS UNDERTAKEN

The scope of the site investigation included the following:

- 14 No. Dynamic Sampled boreholes with Rotary follow-on (BH101-106, BH108, BH110-BH115), with 4 No. locations (BH101B, BH107, BH109 and BH116) undertaking rotary coring base of the inspection pit to a maximum depth of 30.85m bgl to investigate ground conditions and investigate the presence of mine workings at greater depths.
- 7 No. Cable Percussive boreholes (BH201-205A) to a maximum depth of 5.50m bgl to investigate ground conditions within proposed development plots.
- 8 No. Cable Percussive Boreholes (BH301-308) to a maximum depth of 7.50m bgl to investigate ground conditions for site infrastructure.
- 1 No. Cable Percussive Borehole (BH401) to a maximum depth of 0.90m bgl, with rotary follow on. 1 No Rotary borehole (BH402) undertaking rotary core from the base of the inspection pit at 1.20m bgl to a depth of 20.00m bgl and 22.40m bgl respectively. These boreholes were to investigate the groundwater conditions.
- Boreholes were undertaken with SPTs generally carried out at regular intervals below the base of the inspection pits, predominantly at 1.0 m and 1.5 m intervals. Occasional shorter or irregular intervals, typically between approximately 0.5 m and 1.0 m, were also recorded due to changes in ground conditions and/or SPT refusal
- 15 No. Machine dug trial pits (TP501-515) excavated to a maximum depth of 2.10m bgl to investigate ground conditions/contamination within proposed development plots, with soakaway testing undertaken to BRE365.

- 18 No. Machine dug trial pits (TP601-TP615) excavated to a maximum depth of 3.70m bgl to investigate ground conditions for site infrastructure and undertake plate load tests at 0.50m and 1.00m bgl.
- 6 No. Machine dug trial pits (TP701-TP706) excavated to a maximum depth of 0.70m bgl to investigate ground conditions with soakaway testing undertaken to BRE365.
- 1 No. Machine dug trial pit (TP801) excavated to 1.10m bgl investigate ground conditions with soakaway testing undertaken to BRE365.
- 11 No. Variable Head Permeability Tests at locations BH102, BH112, and BH115 at depths of 1.50m and 13.50m bgl (BH102), 5.00m bgl (BH112), 2.50m and 9.50m bgl (BH115).
- 25 No. Rotary Openhole Boreholes to (BHOH01 – BHOH24) to a maximum depth of 30.00m bgl investigate ground conditions.
- Geophysical Survey consisting of 5 x 213m ERT profiles targeting depths of up to 30m with ~6Ha EM & magnetic mapping at 1.50m and 3.00m line spacing (report appended within Appendix I).
- Laboratory testing of soil samples to determine geotechnical parameters.
- Laboratory testing of soil samples to determine environmental chemical composition of soils for geo-environmental assessment, waste classification and aggressivity
- Laboratory testing of surface water samples and groundwater samples to determine environmental chemical composition for geo-environmental assessment
- Preparation of a Factual Ground Investigation report.

The specification was completed in accordance with ICE specification for ground investigation and the works themselves were completed in general accordance with the principles set out in BS EN 1997-2:2007 and with the general practice described in BS5930:2015+A1:2020. The geo-environmental aspects of the ground investigation complied with the general requirements of BS 10175+A1:2017.

Figure 2 shows the layout of the exploratory holes advanced during the site investigation, following as built coordinates provided by WSP. Exploratory hole logs are presented in Appendix B with photographic plates presented in the plates section of the report.

3.1.1 Deviations to Scope

There were some deviations to the initial scope of works due to the ground conditions encountered on site that meant the works could not be undertaken.

Deviations included the following:

- Ground conditions across site led to shallow SPT refusals and termination of most cable percussive locations (BH201-BH205A, BH302-BH308) from target depth, following instruction from WSP.
- Due to shallow refusals and shallow bedrock encountered in other cable percussive boreholes across site, BH206 and BH207 were descoped following instruction from WSP.
- Drilling complications due to ground conditions at BH101 led to the hole being terminated and relocated to BH101A and subsequently BH101B. BH101 was terminated due to an obstructing boulder in the natural ground causing the rotary casing to draw at a sub-vertical angle resulting in a sheared tool between 2.5-3.5m bgl (with no recovery). BH101A was terminated due to a shallow boulder (15.50m depth) which was obstructive to advancing casing into the borehole.

- BH401 were amended to include rotary follow on as the location terminated short of the scheduled depth, with BH402 undertaking rotary core from the base of the inspection pit at 1.20m bgl. Following instruction from WSP, BH401 and BH402 were advanced to 20.00m bgl and 22.40m bgl respectively.
- Shallow bedrock was encountered at TP508, TP513, TP603, TP607, TP608, TP609, TP610, TP611 and TP614 leading to early termination of the trial pits.
- During excavation locations TP504, TP505, TP507, TP515, TP601A, TP606, TP606A, TP612, TP613 and TP615 were terminated due to refusal.
- TP509, TP512, TP602 and TP605 were terminated due to poor pit stability, with TP503, TP601 and TP604 due to water ingress.
- Due to undertaking rotary core methods, from the base of the inspection pit (between 1.20m and 2.1m bgl), there was no recovery within BH116. A further position (BH116A) was dynamically sampled from the base of the inspection pit to 2.10m bgl to obtain sample recovery.
- An additional 2 No. ERT profiles targeting depths of up to 30m were undertaken across the site following instruction in an email dated 08th April 2026. Terra Dat advised due to the shorter line length, a 3m electrode spacing at the location of ETR-1 would affect resolution and result in smearing with depth. They therefore suggested reducing the spacing to 1.5m for ETR 1 which is what was undertaken. The other additional ETR profile was undertaken inline with the others.
- Tetra Tech was instructed by WSP to extend the borehole depth of BH402 to 22m bgl beyond the target depth of 20.00m bgl.
- Due to shallow refusal Tetra Tech were instructed by WSP not to undertake soakaway testing in TP504.
- TP508 was not suitable to undertake a soakaway test in accordance with BRE Digest 365, due to the location failing to maintain a stable head test due the rapid infiltration.
- TP509 filled with groundwater at 0.60m and Tetra Tech were instructed to not undertake soakaway testing.
- TP601 filled with surface water and Tetra Tech were instructed not to undertake soakaway testing.
- Tetra Tech was instructed not to undertake soakaway testing TP613 and TP615 due to pit stability issues.
- No permeability testing undertaken during the works within BH203 and BH308 due to shallow refusal and not reaching the required depth.
- Limited groundwater samples were obtained during the monitoring period due to the depth of groundwater and limited head present within the installations on site.

4.0 GROUND CONDITIONS ENCOUNTERED

4.1 STRATA ENCOUNTERED

The strata encountered beneath the site was;

- Made Ground
- Superficial Deposits
- Weathered South Wales Lower Coal Measures (SWLCM)
- South Wales Lower Coal Measures (SWLCM)

A summary of each stratum depth is provided in the table 4-1 below, with descriptions of each stratum detailed in the subsequent sections, and a summary of installation details, following instruction from WSP, are outlined in table 4-3. Exploratory hole logs can be seen in Appendix B, with the photographic plates appended within the plates section of the report.

Following the main intrusive works, twenty-five rotary open-hole (ROH) boreholes targeting geophysical anomalies were undertaken. Due to the nature of Rotary Openhole drilling, the commentary on ground conditions encountered are based on drilling returns and drilling records only. The ground conditions encountered are presented in table 4-2 below.

The weathering grade of the South Wales Lower Coal Measures was undertaken in accordance with BS 5930:2015+A1:2020.

Table 4-1 – Summary of Ground Conditions Encountered

Location	Depth to base of strata (m bgl)						
	Made Ground	Made Ground (Asphalt)	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
BH101	GL - 0.05	*Ne*	0.05-2.50*	*Ne*	*Ne*	*Ne*	*Ne*
BH101A	*Ne*	*Ne*	GL -12.70	12.70-15.50*	*Ne*	*Ne*	*Ne*
BH101B	GL - 0.40	*Ne*	0.40-7.90 12.40-14.70	*Ne*	14.70-30.60*	*Ne*	*Ne*
BH102	GL–6.00	*Ne*	*Ne*	6.00 – 15.80	15.80–17.10 17.60–30.40*	17.10 – 17.60	*Ne*
BH103	GL – 5.60	*Ne*	5.60-8.50	8.50-9.50	8.50 – 24.40 24.60-30.00*	24.40- 24.60	*Ne*
BH104	GL – 6.30	*Ne*	*Ne*	6.30-11.20	11.20-30.50*	19.80- 20.30	*Ne*
BH105	*Ne*	*Ne*	GL -7.50 9.00 – 12.60	12.60-13.20	13.20-30.20*	27.35- 28.05	*Ne*

Location	Depth to base of strata (m bgl)						
	Made Ground	Made Ground (Asphalt)	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
BH106	GL - 6.00	Ne	Ne	6.00-8.00	8.00-14.30 14.70-30.00*	14.30-14.70	Ne
BH107	GL - 2.00	Ne	Ne	Ne	2.00-30.70*	19.20-19.80	Ne
BH108	GL - 0.75	Ne	Ne	0.75-6.00	6.00-30.10*	Ne	Ne
BH109	GL-1.00	Ne	Ne	Ne	1.00-30.85*	Ne	Ne
BH110	GL-0.15	Ne	Ne	0.15-1.50	1.50- 13.90 14.50-30.50*	13.90-14.50	Ne
BH111	GL-3.10	Ne	Ne	Ne	3.10-30.00*	Ne	Ne
BH112	GL - 0.10	Ne	Ne	0.10-1.50	1.50-30.00*	Ne	Ne
BH113	GL-0.80	Ne	Ne	0.80-5.90	5.90-30.10*	Ne	Ne
BH114	GL – 1.90	Ne	Ne	1.90-8.55	8.55-16.90 17.80-30.60	Ne	16.90-17.80**
BH115	GL-1.50	Ne	Ne	1.50-5.10	5.10-21.90 22.40-30.50*	21.90-22.40	Ne
BH116	GL-1.95	Ne	Ne	1.95 – 2.90	2.90 - 30.30*	Ne	Ne
BH201	GL-0.80*	Ne	Ne	Ne	Ne	Ne	Ne
BH201A	GL-1.20*	Ne	Ne	Ne	Ne	Ne	Ne
BH202	GL-1.70*	Ne	Ne	Ne	Ne	Ne	Ne
BH203	GL-1.30*	Ne	Ne	Ne	Ne	Ne	Ne
BH204	GL-5.50*	Ne	Ne	Ne	Ne	Ne	Ne
BH205	GL -0.50*	Ne	Ne	Ne	Ne	Ne	Ne
BH205A	GL -3.00*	Ne	Ne	Ne	Ne	Ne	Ne
BH301	0.30 – 7.50*	GL – 0.30	Ne	Ne	Ne	Ne	Ne
BH302	GL – 5.00*	Ne	Ne	Ne	Ne	Ne	Ne
BH303	GL–3.20*	Ne	Ne	Ne	Ne	Ne	Ne
BH304	GL -3.00*	Ne	Ne	Ne	Ne	Ne	Ne
BH305	GL -3.00	Ne	Ne	3.00-5.50*	Ne	Ne	Ne
BH306	GL -2.20*	Ne	Ne	Ne	Ne	Ne	Ne
BH307	GL -1.00	Ne	Ne	1.00-2.20*	Ne	Ne	Ne

Location	Depth to base of strata (m bgl)						
	Made Ground	Made Ground (Asphalt)	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
BH308	GL-1.20*	Ne	Ne	Ne	Ne	Ne	Ne
BH401	GL-2.50	Ne	2.50-4.00 4.50-7.00	7.00-8.00	8.40-20.00*	Ne	Ne
BH402	GL-3.10 4.10-4.70	Ne	Ne	Ne	5.50– 22.40*	Ne	Ne
BH402A	GL-0.30	Ne	Ne	Ne	Ne	Ne	Ne
BH402B	GL-0.30	Ne	Ne	Ne	Ne	Ne	Ne
BH402C	GL-0.30	Ne	Ne	Ne	Ne	Ne	Ne
TP501	GL-0.20	Ne	0.20-2.00*	Ne	Ne	Ne	Ne
TP502	GL-2.00*	Ne	Ne	Ne	Ne	Ne	Ne
TP503	GL-0.50*	Ne	Ne	Ne	Ne	Ne	Ne
TP504	GL-0.70*	Ne	Ne	Ne	Ne	Ne	Ne
TP505	GL-1.40*	Ne	Ne	Ne	Ne	Ne	Ne
TP506	GL-2.00*	Ne	Ne	Ne	Ne	Ne	Ne
TP507	GL-0.45*	Ne	Ne	Ne	Ne	Ne	Ne
TP508	GL-1.95*	Ne	Ne	Ne	1.95*	Ne	Ne
TP509	GL-0.60*	Ne	Ne	Ne	Ne	Ne	Ne
TP510	GL -2.00*	Ne	Ne	Ne	Ne	Ne	Ne
TP511	GL -2.10*	Ne	Ne	Ne	Ne	Ne	Ne
TP512	GL -1.80*	Ne	Ne	Ne	Ne	Ne	Ne
TP513	GL -1.50*	Ne	Ne	Ne	Ne	Ne	Ne
TP514	GL -2.00*	Ne	Ne	Ne	Ne	Ne	Ne
TP515	GL – 0.60	Ne	Ne	0.60-1.30*	Ne	Ne	Ne
TP601	GL -0.10*	Ne	Ne	Ne	Ne	Ne	Ne
TP601A	GL-1.30*	Ne	Ne	Ne	Ne	Ne	Ne
TP602	GL -3.70*	Ne	Ne	Ne	Ne	Ne	Ne
TP603	GL-3.60	Ne	Ne	3.60*	Ne	Ne	Ne
TP604	GL-2.60*	Ne	Ne	Ne	Ne	Ne	Ne
TP604A	GL-1.60*	Ne	Ne	Ne	Ne	Ne	Ne
TP605	GL -2.40*	Ne	Ne	Ne	Ne	Ne	Ne

Location	Depth to base of strata (m bgl)						
	Made Ground	Made Ground (Asphalt)	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
TP606	GL -1.00*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP606A	GL -1.40*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP607	GL –2.10	*Ne*	*Ne*	2.10-2.40*	*Ne*	*Ne*	*Ne*
TP608	GL-1.80	*Ne*	*Ne*	1.80-1.95*	*Ne*	*Ne*	*Ne*
TP609	GL -1.60	*Ne*	*Ne*	1.60*	*Ne*	*Ne*	*Ne*
TP610	GL -1.25	*Ne*	*Ne*	1.25*	*Ne*	*Ne*	*Ne*
TP611	GL -2.80	*Ne*	*Ne*	2.80*	*Ne*	*Ne*	*Ne*
TP612	GL 0-1.10*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP613	GL-1.60	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP614	GL-2.20	*Ne*	*Ne*	2.20*	*Ne*	*Ne*	*Ne*
TP615	GL-2.00*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP701	GL -0.60*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP702	GL -0.70*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP703	GL -0.60*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP704	GL -0.60*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP705	GL -0.60*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP706	GL -0.60*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*
TP801	GL-1.10*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*	*Ne*

Ne – Not Encountered *Base of strata not proven / **Potential seam (void/workings)

Table 4-2 – Summary of Ground Conditions Encountered (ROH)

Location	Depth to base of strata (m bgl)					
	Made Ground	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
BHOH01	GL -12.00	*Ne*	*Ne*	12.00-14.70 16.60-30.00*	*Ne*	14.70-16.60
BHOH02	GL -12.00	*Ne*	*Ne*	12.00-15.70 17.00-30.00*	*Ne*	15.70-17.00
BHOH03	GL -12.00	*Ne*	*Ne*	12.00-16.00 16.70-25.00*	*Ne*	16.00-16.70
BHOH04	GL -9.00	*Ne*	*Ne*	9.00-14.60 19.50-25.00*	*Ne*	14.60-19.50
BHOH05	GL -9.00	*Ne*	*Ne*	9.00-25.00*	*Ne*	*Ne*
BHOH06	GL -6.50	*Ne*	*Ne*	6.50-25.00*	*Ne*	*Ne*
BHOH07	GL -9.00	*Ne*	*Ne*	9.00-25.00*	*Ne*	*Ne*
BHOH08	GL -6.50	*Ne*	*Ne*	6.50-16.00 17.20-25.00*	*Ne*	16.00-17.20
BHOH09	GL -9.00	*Ne*	*Ne*	9.00-25.00*	*Ne*	
BHOH10	GL -4.75	*Ne*	*Ne*	4.75-16.00 17.00-25.00*	*Ne*	16.00-17.00
BHOH11	GL -2.00	*Ne*	*Ne*	2.00-16.90 18.30-25.00*	*Ne*	16.90-18.30
BHOH12	GL -3.10	*Ne*	*Ne*	3.10-8.90 12.10-15.00*	*Ne*	8.90-12.10
BHOH13	GL -2.00	*Ne*	*Ne*	2.00-5.30 5.60-10.50 11.40-15.00*	5.30-5.60	10.50-11.40
BHOH14	GL -4.00	*Ne*	*Ne*	4.00-6.10 8.40-15.00*	*Ne*	6.10-8.40
BHOH15	GL -2.00	*Ne*	*Ne*	2.00-3.70 4.70-25.00*	*Ne*	3.70-4.70
BHOH16	GL -5.50	*Ne*	*Ne*	5.50-25.00*	*Ne*	*Ne*
BHOH17	GL-1.20	*Ne*	*Ne*	1.20-2.60 2.70-10.70 11.50-17.50 19.00-25.00*	2.60-2.70	10.70-11.50 17.50-19.00

Location	Depth to base of strata (m bgl)					
	Made Ground	Glacial Till	Weathered SWLCM	SWLCM	Coal Seam	Voids
BHOH18	GL -7.50	*Ne*	*Ne*	7.50-9.80 10.00-15.30 15.30-25.00*	9.80-10.00	15.30-16.20
BHOH19	GL -1.75	*Ne*	*Ne*	1.75-13.50 15.00-25.50*	*Ne*	13.50-15.00
BHOH20	GL -12.00	*Ne*	*Ne*	12.00-18.50 21.00-25.00*	*Ne*	18.50-21.00
BHOH21	GL -7.00*	*Ne*	*Ne*		*Ne*	*Ne*
BHOH21A	GL-15.00	*Ne*	*Ne*	15.00-25.00*	*Ne*	*Ne*
BHOH22	GL -13.70	*Ne*	*Ne*	13.70-25.00*	*Ne*	*Ne*
BHOH23	GL -15.00	*Ne*	*Ne*	15.00-25.00*	*Ne*	*Ne*
BHOH24	GL -12.30	*Ne*	*Ne*	12.30-21.70 23.00-30.00*	*Ne*	21.70-23.00

Ne – Not Encountered *Base of strata not proven / **Potential seam (void/workings)

4.1.1 Made Ground

Made Ground was encountered across the site and was identified in locations, outlined in tables 4-1 and 4-2 above, varying in thickness and being encountered to a maximum depth of 15.00m bgl which was encountered in BHOH23.

This stratum was encountered as a coarse-grained material and typically consisted of a slightly clayey sandy GRAVEL, silty gravelly SAND, or a clayey gravelly SAND. Sands were typically fine to coarse, and gravels were fine to coarse angular to subangular of mudstone, siltstone, limestone.

A fine-grained material was also encountered and typically consisted of a sandy gravelly CLAY, sandy gravelly SILTY/CLAY, a silty gravelly CLAY, silty sandy gravelly CLAY, or a sandy very gravelly CLAY. Sands were typically fine to coarse, and gravels were fine to coarse subangular to subrounded siltstone, mudstone and limestone.

The stratum had locally variable cobble and boulder content and was typically shades of brown or grey in colour. This stratum also had localised inclusions of anthropogenic detritus of brick, concrete, slag, clinker, plastic sheeting, glass concrete and had varying shades of light to dark greyish brown with some orangish brown mottling at TP612 and TP614. The strata encountered was typically varying shades of light to dark greyish brown.

Made Ground (Topsoil) was also encountered and described as fine- and coarse-grained material above with occasional to common rootlets.

The density of the strata encountered for the fine-grained material was firm to very stiff and loose to very dense for the coarse-grained material.

4.1.2 Glacial Till

Glacial Till was encountered in seven of the exploratory locations to a maximum depth of 14.70m bgl, which was encountered in BH101B.

This stratum was encountered as a sandy gravelly CLAY/SILT or as GRAVELS and COBBLES. Sands were typically fine to coarse and gravels were subangular to subrounded fine to coarse of siltstone, sandstone, limestone, mudstone and localised quartzite with some and many cobbles of the same. The stratum was generally shades of brown to orangish brown in colour.

The density of the strata encountered for the fine-grained material was soft to very stiff and medium dense to very dense for the coarse-grained material.

4.1.3 Weathered South Wales Lower Coal Measures

Weathered South Wales Lower Coal Measures was encountered across site and was found to be either underlying the Made Ground or Superficial Deposits. The strata encountered was generally described as an extremely to very weak thinly and thickly laminated MUDSTONE or SILTSTONE which has totally weathered to clay (grade IV). Gravel is angular to subangular locally tabular fine to coarse of mudstone and siltstone.

This stratum was universally found to have some residual rock structures which included laminations and/or lithorelicts.

The density of the Weathered South Wales Lower Coal Measures encountered was classified as stiff to very stiff.

4.1.4 South Wales Lower Coal Measures & Coal Seams

South Wales Lower Coal Measures were encountered to be underlying either the Made Ground or a horizon of Weathered bedrock at the locations outlined in tables 4-1 and 4-2 above, with the shallowest being encountered at 0.75m bgl in BH108.

The strata were generally encountered as grey to black carbonaceous locally interbedded MUDSTONE or SILTSTONE with localised thin laminations of sandstone bands. Localised siderite nodules were also encountered. Coal Seams were also encountered within this formation. Coal was encountered in thirteen of the exploratory locations, the shallowest of which was at 2.60m within BH0H17 and the deepest at 27.35m bgl in BH105.

The weathering grade was generally classified between fresh, slightly weathered and completely weathered (grade I to V). The density of the strata encountered was classified as extremely weak to strong.

Table 4-3 – Summary of Installations

Location	Installation Summary				
	Borehole Type (m bgl)	Standpipe Type	Installation Depth (m bgl)	Diameter (mm)	Installation
BH102	Dynamic Sampling + Rotary Coring (DS+RC)	Gas and Groundwater	6.00	50	GL – 3.00m (Plain) 3.00 – 6.00m (Slotted)
BH108	Dynamic Sampling + Rotary Coring (DS+RC)	Gas	18.50	19	GL – 15.50m (Plain) 15.50 – 18.50m (Slotted)
		Groundwater	5.00	50	GL – 1.00m (Plain) 1.00 – 5.00m (Slotted)
BH109	Dynamic Sampling + Rotary Coring (DS+RC)	Gas	7.50	19	GL – 4.50m (Plain) 4.50 – 7.50m (Slotted)
		Groundwater	21.00	50	GL – 15.00m (Plain) 15.00 – 21.00m (Slotted)
BH112	Dynamic Sampling + Rotary Coring (DS+RC)	Gas and Groundwater	7.00	50	GL – 4.00m (Plain) 4.00 – 7.00m (Slotted)
BH115	Dynamic Sampling + Rotary Coring (DS+RC)	Gas	7.50	19	GL – 4.50m (Plain) 4.50 – 7.50m (Slotted)
		Groundwater	22.00	50	GL – 16.00m (Plain) 16.00 – 22.0m (Slotted)
BH116	Dynamic Sampling + Rotary Coring (DS+RC)	Gas and Groundwater	6.50	50	GL – 4.50m (Plain) 4.50 – 6.50m (Slotted)

Location	Installation Summary				
	Borehole Type (m bgl)	Standpipe Type	Installation Depth (m bgl)	Diameter (mm)	Installation
BH204	Cable Percussive (CP)	Groundwater	5.50	50	GL-0.50m (Plain) 0.50-5.50m (Slotted)
BH301	Cable Percussive (CP)	Groundwater	4.80	50	GL-1.80m (Plain) 1.80-4.80m (Slotted)
BH302	Cable Percussive (CP)	Groundwater	5.00	50	GL-1.00m (Plain) 1.80-5.00m (Slotted)
BH303	Cable Percussive (CP)	Groundwater	3.00	50	GL – 1.00m (Plain) 1.00 – 3.00m (Slotted)
BH304	Cable Percussive (CP)	Groundwater	3.00	50	GL – 1.00m (Plain) 1.00 – 3.00m (Slotted)
BH305	Cable Percussive (CP)	Groundwater	5.50	50	GL – 2.00m (Plain) 2.00 – 5.50m (Slotted)
BH306	Cable Percussive (CP)	Groundwater	1.80	50	GL – 1.00m (Plain) 1.00 – 1.80m (Slotted)
BH307	Cable Percussive (CP)	Groundwater	2.20	50	GL – 1.00m (Plain) 1.00 – 2.20m (Slotted)

Location	Installation Summary				
	Borehole Type (m bgl)	Standpipe Type	Installation Depth (m bgl)	Diameter (mm)	Installation
BH401	Dynamic Sampling + Rotary Coring (DS+RC)	Gas	4.00	19	GL – 1.00m (Plain) 1.00 – 4.00m (Slotted)
		Groundwater	20.00	50	GL-17.00m (Plain) 17.00-20.00m (Slotted)
BH402	Dynamic Sampling + Rotary Coring (DS+RC)	Groundwater	22.40	50	GL – 18.40 (Plain) 18.40 – 22.40 (Slotted)

4.2 GROUNDWATER

Groundwater strikes were noted in six of the exploratory hole locations across the site during the intrusive works.

Details of the water strikes can be found in table 4-4 below:

Table 4-4 – Summary of Groundwater Strikes Encountered

Exploratory Location	Groundwater Strike (m bgl)	Comments
BH205A	1.20	Seepage. Water level rose to 1.00m bgl after 20 minutes.
BH302	4.30	Water rose to 3.95m after 20minutes.
TP503	0.30	Water was static after 20 minutes.
TP509	0.50	Water was static after 30 minutes
TP512	1.20	Water level was static after 20 minutes
TP601	0.10	Rapid surface water ingress at 0.10 rising to surface.
TP604	2.50	Water level rose to 2.45m after 20 minutes
TP607	2.40	Water level was static after 25 minutes

It may be possible further water strikes were encountered, however due to the nature of the cable percussive drilling techniques, the use of water flush during rotary drilling methods and the shallow nature of the other exploratory locations, it was not possible to positively identify these to an accurate depth during the works. Tables 6-1 and 6-2 show groundwater readings taken during and following the Ground Investigation. Readings are presented until 30th June 2026.

For full details of the water strikes at each location, and how quickly groundwater rose, please see the full exploratory logs presented in Appendix B.

4.3 IN-SITU TESTING

4.3.1 Standard Penetration Testing

Standard Penetration Tests were undertaken at 1.00m intervals to 5.00m bgl and at 1.50m intervals thereafter in the rotary and cable percussive boreholes in accordance with BS EN ISO 22476-3 (2005) and BS5930 (2015) to assess the relative density of the Made Ground, Superficial Deposits and Weathered Lower South Wales Coal Measures encountered within the borehole.

As stipulated by BS5930:2015, the SPT N-values represented on the borehole log are the uncorrected results which were obtained in the field, and these are presented on the borehole logs in Appendix B.

4.3.2 Plate Load Testing

Twenty-four CBR tests via plate load method were undertaken in the locations of the excavated trial pits at 0.50m and 1.00m bgl. The test results are presented in Appendix H and a summary of the results are presented in table 4-5 below.

Table 4-5 Summary of Plate Load Tests

Location	Depth (m bgl)	Deformation Modulus (E) (kN/m²)	Degree of Rebound (%)	Load required to achieve 1.25mm settlement (kN/m²)	Modulus of subgrade reaction (kPa/m)	Derived CBR value (%)
TP601A	0.50	11.60	14.30	33.80	24603	4.2
TP601A	1.00	4.70	47.70	13.50	9848	1.3
TP602	0.50	21.4	48.5	62.3	45319	9.3
TP602	1.00	7.0	47.70	20.20	14734	2.2
TP603	0.50	7.8	20.50	22.50	16414	2.50
TP603	1.00	7.0	26.4	20.3	14473	2.2
TP604	0.50	8.3	39.30	24.1	17581	2.8
TP604	1.00	9.6	38.2	28.1	20422	3.3
TP605	0.50	24.2	58.3	70.4	51239	10.9
TP605	1.00	8.5	49.3	24.8	18065	2.9

TP606	0.50	13.5	44.1	39.2	28556	5.1
TP606	1.00	6.2	58.4	18.1	13166	1.9
TP607	0.50	6.9	46.4	20	14583	2.2
TP607	1.00	14.2	12.9	41.2	30013	5.5
TP608	0.50	28.4	40.7	82.7	60185	13.4
TP608	1.00	18.6	46.7	54.1	39360	7.8
TP609	0.50	15.6	48.4	45.3	32971	6.2
TP609	1.00	17.3	58.2	50.2	36576	7.1
TP610	0.50	25.8	42.8	75.1	54688	11.8
TP610	1.00	26.6	32.7	77.4	56312	12.3
TP611	0.50	21.9	40.4	63.8	46429	9.6
TP611	1.00	7.2	45.3	20.9	15248	2.3
TP614	0.50	16.4	61.5	47.8	34786	6.6
TP614	1.00	13.0	59.4	37.7	27476	4.9

4.3.3 Variable Head Permeability Testing

A total of eleven variable head permeability tests were undertaken as instructed by WSP at designated depths during the drilling process in rotary boreholes BH102, BH112, BH115 in accordance with BS EN ISO 22282-2:2012.

Variable head permeability tests results are presented in Appendix F.

4.3.4 Soakaway Testing

A total of 15 Soil infiltration tests were carried out to BRE 365 Digest, designated in accordance with Schedule 2 of the WSP Ground Investigation Specification, with locations highlighted in the deviations section and the table below as not being suitable for testing following instruction from WSP. The tests were undertaken within the Made Ground deposits with results presented in table 4-6 below.

Testing was only undertaken within a single shift and where infiltration permitted a further second and third test was undertaken. Test locations were securely fenced and covered until the testing period was completed and excavations backfilled on completion.

The results of the soil infiltration tests are presented in the following table. Full test results are included in Appendix G of this report.

Table 4-6 Summary of Soakaway Test Results

Location	Depth (m bgl)	Target Strata	Hydraulic Conductivity (m/sec)		
			Test 1	Test 2	Test 3
TP504	0.70	Made Ground	No tests undertaken due to WSP terminating location due to shallow refusal.		
TP505	1.40	Made Ground	$5.70E^{-05}$	$7.27E^{-05}$	$5.46E^{-05}$

TP507	0.45	Made Ground	$9.51E^{-05}$	$6.44E^{-05}$	$5.38E^{-05}$
TP508	0.80	Made Ground	1700litres drained into pit in 7 minutes. Pit could not be filled.		
TP509	0.60	Made Ground	Unable to complete test due to Groundwater strike		
TP510	2.00	Made Ground	Test failed – did not reach 75% infiltration invert level after 2 hours.	No test due to insufficient time	No test due to insufficient time
TP511	2.10	Made Ground	$4.73E^{-05}$	Test failed – did not reach 25% infiltration invert level after 30 minutes of testing. Test aborted due to pit collapse	No test due to insufficient time
TP512	1.80	Made Ground	Pit could not be filled – 1700litres drained into pit after 5 minutes		
TP513	1.50	Made Ground	$5.54E^{-05}$	Test failed – did not reach 25% infiltration invert level after 2 hours	Test failed – did not reach 25% infiltration invert level after 2 hours
TP515	1.30	Made Ground	Test failed – did not reach 25% infiltration invert level due to no infiltration after 25 minutes (location terminated by WSP)	No test undertaken	No test undertaken
TP601	0.10	Made Ground	Location not suitable due to rapid ingress of surface water		
TP613	1.60	Made Ground	No test undertaken following instruction due to pit stability issues		
TP615	2.00	Made Ground	No test undertaken following instruction due to pit stability issues		
TP701	0.60	Made Ground	Test failed – did not reach 75% infiltration invert level after 2 hours.	No test due to insufficient time	No test due to insufficient time
TP702	0.70	Made Ground	$2.82E^{-05}$	$6.70E^{-05}$	Test failed – did not reach 25% infiltration invert level after 49 minutes.

TP703	0.60	Made Ground	$2.74E^{-04}$	$1.41E^{-04}$	Test failed – did not reach 25% infiltration invert level after 8mins 15 seconds.
TP704	0.60	Made Ground	Test failed – did not reach 75% infiltration invert level due to no infiltration after 2 hours.	No test due to insufficient time	No test due to insufficient time
TP705	0.60	Made Ground	Test failed – did not reach 75% infiltration invert level as pit could not be filled due to rapid infiltration. 1700litres drained into pit in 8 minutes.	No test due to insufficient time	No test due to insufficient time
TP706	0.60	Made Ground	Test failed – did not reach 75% infiltration invert level as pit could not be filled due to rapid infiltration. 1700litres drained into pit in 8 minutes.	No test due to insufficient time	No test due to insufficient time
TP801	1.10	Made Ground	$3.00E^{-04}$	No test due to insufficient time	No test due to insufficient time

Due to time constraints TP702 Test 3 was not completed. TT was instructed to undertake an additional test (Test 4) with a resulting infiltration rate of $5.13E^{-05}$.

4.3.5 Geophysical Survey

A Geophysical Survey was undertaken by TerraDat between 7th and 9th April 2026. The survey aimed to map potential historical mine entries and confirm the location of the highwall of a former open-cast pit.

The survey was undertaken using a combination of magnetic, electromagnetic, and electrical resistivity methods (ERT). Magnetic and electromagnetic surveying was selected to identify contrasting geophysical signatures of historical mine workings, while the electrical resistivity method was used to identify and confirm the highwall.

The results are presented within the TerraDat Report (Ref. TD9740 Goat Mill Road) within Appendix I.

4.4 VISUAL OR OLFACTORY EVIDENCE OF CONTAMINATION

Exploratory hole locations encountered Made Ground, as outlined in tables 4-1 and 4-2 above. Exploratory locations TP604 and TP607 encountered a water strike which was observed to have an oily sheen (no iridescence) and a bituminous odor. Hydrocarbon odor was noted within TP604 and BH106 with sulphureous odors also identified in exploratory hole locations TP601A and TP615 with further details are outlined within the ground investigation logs in Appendix B. However, no locations had visible evidence of anthropogenic debris including potential Asbestos Containing Materials (ACMs) with the potential to contain asbestos free fibres

No further visual or olfactory evidence of gross contamination was encountered within made ground or natural deposits on site. Environmental samples were taken from a range of depths across the site and scheduled for testing by WSP. The test results from samples analysed for contamination are included in Appendix D, with further details, including PID results, being provided on the ground investigation logs in Appendix B.

4.5 OBSTRUCTIONS

All exploratory positions were cleared of services and obstructions prior to the start of the works by Safe Dig using Ground Penetrating Radar (GPR) and a CAT 4+ and Genny. The positions were further re-scanned by a Tetra Tech engineer every 300mm during excavation to 1.20m bgl or where a shallow refusal was encountered, the location was further re-scanned prior to advancing.

Please note that the GPR clearance was limited to the proposed exploratory positions only. Where positions were relocated within the remit of the initial GPR clearance, the locations were cleared using a CAT 4+ and Genny by a TT engineer. Where new positions were instructed or where positions required relocating outside the initial clearance, these were further cleared of services and obstructions by Safe Dig using Ground Penetrating Radar (GPR) and a CAT 4+ and Genny.

Obstructions that were encountered during the works, which caused deviations to the original scope, are outlined within section 3.1.1, with commentary on the obstructions being shown in table 4-7 below.

Table 4-7 – Summary of Obstructions Encountered

Exploratory Location	Obstruction Comments
BH402	Location refused on concrete and a series of inspection pits (BH402A, BH402B and BH402C) were excavated prior to advancing.
BH201	Location was terminated at 1.20m bgl following a refusal of a SPT.
BH202	Borehole terminated at 1.70m bgl due to refusal.
BH203	Borehole terminated at 1.30m bgl due to refusal.
BH204	Borehole terminated at 5.50m bgl due to refusal.

BH205	Initial inspection pit was terminated due to refusal.
BH205A	Borehole terminated at 3.00m bgl due to refusal.
BH302	Borehole terminated at 5.00m bgl due to shallow refusal
BH303	Borehole terminated at 3.20m bgl due to refusal.
BH304	Borehole terminated at 3.00m bgl due to refusal.
BH305	Borehole terminated at 5.50m bgl due to refusal.
BH306	Borehole terminated at 1.80m bgl due to refusal.
BH307	Borehole terminated at 2.20m bgl due to refusal.
BH101	Drilling equipment during advancement of the hole was sheared off between 2.5-3.5m bgl and borehole was terminated.
BH101A	Deviation to the rotary rig during drilling meant the borehole was terminated and relocated to 101B.
TP504	Trial Pit terminated at 0.70m bgl due to refusal
TP505	Trial Pit terminated at 1.40m bgl due to refusal
TP507	Trial Pit terminated at 0.45m bgl due to refusal
TP508	Trial Pit terminated at 1.95m bgl due to refusal on suspected bedrock
TP509	Trial Pit terminated at 0.60m due to poor pit stability
TP512	Trial Pit terminated at 1.80m due to poor pit stability
TP513	Trial Pit terminated at 1.50m bgl due to refusal on suspected bedrock
TP515	Trial Pit terminated at 1.30m bgl due to refusal
TP601	Large volumes of surface water meant location was not suitable for a plate load test. Position was relocated to TP601A which was terminated at 1.30m bgl due to pit stability.
TP602	Trial Pit terminated at 3.70m bgl due to poor pit stability

TP603	Trial Pit terminated at 3.60m bgl due to refusal on suspected bedrock
TP604	Trial Pit terminated at 2.60m bgl due to water ingress.
TP605	Trial Pit terminated at 2.40m bgl due to poor pit stability.
TP606 and TP606A	Trial Pits terminated due to refusal at 1.00m bgl and 1.40m bgl respectively.
TP607	Trial Pit terminated at 2.40m bgl due to refusal on suspected bedrock
TP608	Trial Pit terminated at 1.95m bgl due to refusal on suspected bedrock
TP609	Trial Pit terminated at 1.60m bgl due to refusal on suspected bedrock
TP610	Trial Pit terminated at 1.25m bgl due to refusal on suspected bedrock
TP611	Trial Pit terminated at 2.80m bgl due to refusal on suspected bedrock
TP612	Trial Pit terminated at 1.10m bgl due to refusal
TP613	Trial Pit terminated at 1.60m bgl due to refusal
TP614	Trial Pit terminated at 2.20m bgl due to refusal on suspected bedrock
TP615	Trial Pit terminated at 2.00m bgl due to refusal

5.0 LABORATORY TESTING

5.1 GEOTECHNICAL TESTING

A programme of laboratory testing is to be carried out on samples taken from the various strata encountered during the site investigation. Geotechnical testing was carried out by GSTL Ltd, an approved supplier in accordance with the requirements of Tetra Tech quality system and UKAS accredited for a range of geotechnical tests. The test procedures used were generally in accordance with the methods described in BS1377:1990.

Quantities of geotechnical testing are outlined in table 5-1 below, and the results are presented in Appendix C.

Table 5-1 - Summary of Geotechnical Testing

Test	No.	Test Method
Moisture Content	27	BS1377:1990 Part 2:3.2
Atterberg 4 Point Liquid & Plastic Limit	27	BS1377:1990 Part 2:4.3&5.3
PSD: Wet Sieve method	74	BS1377:1990 Part 2:9.2
CBR (4.5 Kg) (Soaked)	4	BS 1377-4:1990
Consolidated drained shear strength by direct shear of a set of three specimens in a large shear box (300x300mm)	7	BS EN ISO 17892-10:2018
Unconfined Compressive Strength (UCS)	6	BS EN ISO 17892-7:2018
Point Loads (Set of 5/10)	26	ISRM Suggested Method for Determining Point Load Strength (1985/2016)
BRE Suite D (pyrite present)	71	BRE Special Digest 1 (SD1:2005)

5.2 ENVIRONMENTAL TESTING

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by I2 Environmental Laboratories, an approved supplier in accordance with the requirements of Tetra Tech quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by WSP in accordance Appendix E of the Preconstruction Instruction Information – Schedule 1.20.3 'Chemical Laboratory Testing for Contamination'. The testing quantities are summarised in table 5-2 for soil samples and table 5-3 for water samples. The test results are included in Appendix D.

Two additional testing parameters Manganese and Aluminium were scheduled for analysis on seven samples with E1 analysis undertaken. At the time of writing Tetra Tech are awaiting instruction on the additional testing for the remaining samples.

Table 5-2 - Summary of Environmental Testing (Soils)

Test suite	No.
Suite E1 – Soil Samples General ○ Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Antimony, Beryllium, Vanadium and Boron (water soluble) ○ Inorganics – including pH, Water soluble Sulphate as SO4 (2:1 Extract), Cyanide (Easily liberatable- low level); ○ Phenols (total).	54
Suite E2a – Soil Samples Asbestos ID ○ Asbestos presence and identification	23
Suite E2b – Soil Samples Asbestos Quantification ○ Asbestos Quantification HSG248	0
Suite E3 – Soil Samples TPHCWG ○ TPHCWG (C6-C40) Cleaned -up	31
Suite E4 – Soil Samples PAH ○ USEPA 16 Polyaromatic Hydrocabons	46
Suite E5 – Soil Samples VOC and sVOCs ○ VOCs (Volatile Organic Compound) ○ sVOCs (Semi Volatile Organic Compounds)	8

Suite E6 – Soil Samples PCB ○ Polychlorinated Biphenyls (PCBs)	0
Suite E7 – Soil Samples Coal Tar ○ Coal Tar Testing	0
Suite L1- Soil Leachability general CEN10:1 ○ Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Antimony, Beryllium, Vanadium, Ammoniacal nitrogen, Chloride, Calcium, Manganese, and Boron (water soluble) ○ Inorganics – including pH, Water soluble Sulphate as SO4 (2:1 Extract), Cyanide (Easily liberatable- low level); ○ Phenols (total).	2
Suite L2 - Soil Leachability, TPH CWG, PAH ○ TPH CWG ○ 16 Polyaromatic Hydrocarbons	2

Table 5-3 - Summary of Environmental Testing (Waters)

Test suite	No.
Suite F1 – Water Samples General ○ Heavy metals including Chromium (Hexavalent), Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium, Zinc, Antimony, Beryllium, Vanadium, Ammoniacal nitrogen, Manganese ○ Inorganics – including pH, Cyanide, Ammonia, Chloride ○ Phenols (total).	6
Suite F2 – Water Samples TPH ○ TPHCWG	6
Suite F3 – Water Samples PAH ○ USEPA 16 Polyaromatic Hydrocabons	6
Suite F4 – Water Samples VOC and sVOCs ○ VOCs (Volatile Organic Compound) ○ sVOCs (Semi Volatile Organic Compounds)	6
Suite F5 – Water Samples (Other Parameters) ○ Ferric Iron (FE(III)), Ferrous Iron (FE(II)), Magnesium, Sodium, Potassium, Sulphates, Sulphides, Nitrate, Nitrite, Alkalinity	6
Suite F6 – Surface Water Samples ○ Dissolved Organic Carbon (DOC) ○ Dissolved Calcium	4

6.0 GROUNDWATER AND GAS MONITORING

6.1 GROUNDWATER MONITORING

Groundwater levels were monitored during and following completion of the ground investigation. Monitoring data are presented in Appendix E, with summary groundwater levels provided in tables 6-1 and 6-2.

Table 6-1- Summary of Groundwater Levels During Ground Investigation

Location	GW level (m bgl)	Date Monitored		Location	GW level (m bgl)	Date Monitored
BH102	5.39	09/04/2026		BH109	21.01	12/05/2026
BH102	5.39	16/04/2026		BH112	6.70	27/04/2026
BH102	5.50	23/04/2026		BH112	6.70	05/05/2026
BH102	5.55	30/04/2026		BH112	6.69	12/05/2026
BH102	5.43	07/05/2026		BH115	21.77	07/05/2026
BH108	Dry	15/04/2026		BH116	Dry	11/05/2026
BH108	Dry	22/04/2026		BH204	5.25	16/03/2026
BH108	5.17	29/04/2026		BH204	5.13	23/03/2026
BH108	5.02	06/05/2026		BH204	5.25	30/03/2026
BH109	21.20	24/03/2026		BH204	Wet at base	06/04/2026
BH109	21.02	31/03/2026		BH204	Wet at base	13/04/2026
BH109	21.03	07/04/2026		BH204	5.16	20/04/2026
BH109	20.99	14/04/2026		BH204	5.27	27/04/2026
BH109	21.02	21/04/2026		BH204	5.15	05/05/2026
BH109	21.01	28/04/2026		BH204	5.28	12/05/2026
BH109	21.00	05/05/2026		BH301	Dry	11/05/2026
BH109	21.01	12/05/2026		BH302	3.70	12/05/2026
BH112	6.70	27/04/2026		BH303	Dry	18/03/2026
BH112	6.70	05/05/2026		BH303	Dry	25/03/2026
BH112	6.69	12/05/2026		BH303	Wet at base	01/04/2026
BH115	21.77	07/05/2026		BH303	2.76	08/04/2026
BH116	Dry	11/05/2026		BH303	Wet at base	15/04/2026
BH204	5.25	16/03/2026		BH303	2.78	22/04/2026
BH204	5.13	23/03/2026		BH303	2.78	29/04/2026
BH303	2.78	06/05/2026		BH307	Dry	09/04/2026

Location	GW level (m bgl)	Date Monitored	Location	GW level (m bgl)	Date Monitored
BH304	Dry	18/03/2026	BH307	Dry	16/04/2026
BH304	Dry	25/03/2026	BH307	2.17	23/04/2026
BH304	2.50	01/04/2026	BH307	1.18	30/04/2026
BH304	Wet at base	08/04/2026	BH307	2.20	07/05/2026
BH304	Wet at base	15/04/2026	BH401	19.98	15/04/2026
BH304	2.57	22/04/2026	BH401	19.97	22/04/2026
BH304	2.58	29/04/2026	BH401	19.98	29/04/2026
BH304	2.57	06/05/2026	BH401	19.90	06/05/2026
BH305	Dry	18/03/2026	BH402	17.50	05/05/2026
BH305	Dry	25/03/2026	BH402	20.10	12/06/2026
BH305	Dry	01/04/2026			
BH305	Dry	08/04/2026			
BH305	Dry	15/04/2026			
BH305	Dry	15/04/2026			
BH305	Dry	22/04/2026			
BH305	Dry	29/04/2026			
BH305	Dry	06/05/2026			
BH306	Dry	19/03/2026			
BH306	Dry	26/03/2026			
BH306	Wet at base	02/04/2026			
BH306	1.34	09/04/2026			
BH306	Wet at base	16/04/2026			
BH306	1.10	23/04/2026			
BH306	1.18	30/04/2026			
BH306	1.15	07/05/2026			
BH307	Dry	19/03/2026			
BH307	Dry	26/03/2025			
BH307	Dry	02/04/2025			

Notes:

- Groundwater readings were taken using a Solinst Interface Meter.
- No Separate-Phase Hydrocarbons (SPH) was encountered during the monitoring.

Table 6-2- Summary of Groundwater Levels Following Ground Investigation

Groundwater Level (m bgl)						
Location	Visit 1 14/05/2026	Visit 2 19/05/2026	Visit 3 03/06/2026	Visit 4 10/06/2026	Visit 5 26/06/2026	Visit 6 30/06/2026
BH102	5.53	6.05	5.65	6.00	Dry	5.60
BH108 19mm	16.60	16.61	16.56	16.54	Dry	16.55
BH108 50mm	5.05	5.26	4.94	4.80	Dry	5.04
BH109 19mm	5.74	5.70	5.74	5.80	Dry	Dry
BH109 50mm	21.04	20.98	Dry	21.03	Dry	21.05
BH112	6.97	7.00	Dry	7.06	Dry	6.93
BH115 19mm	Dry	7.65	7.63	7.65	Dry	Dry
BH115 50mm	20.31	20.34	20.49	20.50	Dry	21.05
BH116	Dry	Dry	Dry	6.43	Dry	Dry
BH204	5.34	5.30	5.21	5.38	Dry	5.27
BH301	Dry	4.70	4.70	4.70	Dry	4.70
BH302	4.45	3.64	3.74	3.42	Dry	Dry
BH303	2.80	2.80	2.78	2.83	Dry	2.79
BH304	Dry	2.58	Dry	2.66	Dry	2.59
BH305	Dry	Dry	Dry	Dry	Dry	Dry
BH306	1.18	1.45	Dry	1.06	Dry	1.15
BH307	2.20	2.26	Dry	2.20	Dry	2.22
BH401 19mm	Dry	Dry	Dry	3.98	Dry	3.78

Groundwater Level (m bgl)						
Location	Visit 1 14/05/2026	Visit 2 19/05/2026	Visit 3 03/06/2026	Visit 4 10/06/2026	Visit 5 26/06/2026	Visit 6 30/06/2026
BH401 50mm	20.03	20.20	20.05	20.00	Dry	20.01
BH402	20.35	22.25	Dry	21.97	Dry	20.10

Notes:

- Groundwater readings were taken using a Solinst Interface Meter.
- No Separate-Phase Hydrocarbons (SPH) was encountered during the monitoring.

6.2 GROUND GAS MONITORING

Ground gas levels were monitored on 6 No. occasions following the completion of the ground investigation, between 14/05/2026 and 30/06/2026. The monitoring data is presented in Appendix E and summarised in table 6-3 below:

Table 6-3 – Summary of Ground Gas Monitoring

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (l/h)
BH102	0.00–0.20	0.10–2.00	13.80–20.70	1.00	0.00–1.00	0.00–0.5
BH108 19mm	0.00–0.10	0.10–2.50	17.80–19.80	1.00	1.00	0.00–0.5
BH108 50mm	0.00–0.10	0.10–2.30	18.90–20.50	1.00	1.00	0.00–0.6
BH109 19mm	0.00–0.10	0.10–2.90	13.50–21.00	1.00	1.00	0.00–0.5
BH109 50mm	0.00–0.10	0.10–3.80	17.50–21.70	1.00	1.00	0.00–0.5
BH112	0.00–0.10	0.10–2.70	17.90–21.30	1.00	1.00	0.10–0.6
BH115 19mm	0.00–0.10	0.70–3.00	19.40–20.00	1.00	1.00	0.00–0.5
BH115 50mm	0.00–0.10	0.90–3.90	15.20–19.70	1.00	1.00	0.00–0.6
BH116	0.00–0.10	0.50–2.00	18.10–19.60	1.00	1.00–7.00	0.00–0.5
BH204	0.00–0.10	0.50–2.70	18.40–20.30	1.00	1.00–2.00	0.00–0.6
BH301	0.00–0.10	0.00–0.10	4.40–21.30	1.00	1.00	0.00–0.5
BH302	0.00–0.10	0.00–0.30	9.80–19.10	1.00	1.00	0.00–0.5
BH303	0.00–0.10	0.80–1.30	16.00–20.30	1.00	1.00	0.00–2.1
BH304	0.00–0.10	0.30–1.90	19.30–21.30	1.00	1.00	0.10–0.7

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (l/h)
BH305	0.00–0.10	0.10–1.30	19.80–21.70	1.00	1.00	0.00–0.6
BH306	0.00–0.10	0.10	18.50–19.70	1.00	1.00	0.00–0.5
BH307	0.00–0.10	0.10–0.20	14.90–21.00	1.00	1.00	0.00–0.5
BH401 19mm	0.00–0.10	0.40–1.00	16.2–20.40	1.00	1.00	0.00–0.4
BH401 50mm	0.00–0.10	0.10–3.80	15.5–21.50	1.00	1.00	0.00–0.4
BH402	0.00–0.10	0.10	18.1–21.20	1.00	1.00	0.10–0.5

The results indicate measurable concentrations of carbon dioxide (maximum of 3.90%/vol) and methane (maximum 0.20%/vol).

The maximum gas flow recorded across the monitoring round was a flow of 2.10 l/hr, recorded at BH303.

The maximum PID reading was 0.20ppm identified in BH102 during visit 5 on 26th June 2026.

The six monitoring rounds were undertaken during atmospheric pressure conditions ranging from 963mb to 1023 mb. A review of atmospheric pressure graphs on weatheronline.co.uk indicates that monitoring was undertaken during the following:

- Visit 1: Rising pressure (1004mb to 1005mb)
- Visit 2: Rising pressure (1005mb to 1006mb) with 1004mb recorded at midday.
- Visit 3: Falling pressure (1002mb to 997mb)
- Visit 4: Falling pressure (1002mb to 997mb)
- Visit 5: Rising pressure (1012mb to 1016mb)
- Visit 6: Falling pressure (1023mb to 1022mb) with 1021mb recorded at midday.

Maximum concentrations of carbon monoxide and hydrogen sulphide of 7ppm and 1 ppm were recorded respectively.

7.0 NOTES

1. Standards

All boring operations, sampling of soils, *in situ* testing and geotechnical laboratory testing have been carried out in accordance with the recommendations of the British Standards BS 5930(2015)[(1)], BS 1377 (1990)[(2)] and BS10175 (2001)[(3)].

Soil and rock descriptions follow the recommendations of BS 593. Where descriptions or classifications are based on other documents (e.g. BS 8004 (1986) or CIRIA Project Report 11 (1993)), this is stated in the report text.

2. Site methods

Unless specifically stated otherwise, the following methods are used for exploratory holes.

- Holes described as cable percussive are bored using a light cable percussive rig. Standard penetration tests are carried out where appropriate, as shown in the logs. Disturbed and undisturbed samples are taken from the exploratory holes at the depths on the records.
- Window sampling generally uses the windowless sampling method, using a tracked Geotool.
- Dynamic probes are usually heavy dynamic probes, using the same tracked Geotool used for window sampling.

3. Definitions and abbreviations

The following terms are used in the exploratory hole logs

Samples

U	Undisturbed 102mm dia. sample
TW	Thin Walled undisturbed 102mm dia. sample
B	Bulk sample
D	Small disturbed sample
W	Water sample
CBR	California Bearing Ratio test or CBR value obtained from Mexiprobe test

In situ tests

S	Standard penetration test (SPT)
N	SPT N value (blows/300mm)
HP	Hand penetrometer – shear strength
SV	Hand shear vane – shear strength
VOC	Volatile organic compounds (ppm)
PID	Photo-ionisation detector – used to detect the presence of VOCs.

Core recovery and rock quality

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture index
NR	No recovery
NI	Not intact

Rotary drilling sizes

	Nominal diameter (mm)	
Index letter	**Borehole**	**Core**
N	75	54
H	99	76
P	120	92
S	146	113

Water strikes

▽	Level of water strike
▼	Water level rose to this level (see Remarks at foot of log for details)

Depth means depth below existing ground level unless otherwise specified. Values specified in soil descriptions given in the exploratory hole logs are depths unless otherwise specified.

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FIGURES

Figure 1 – Site Location Plan

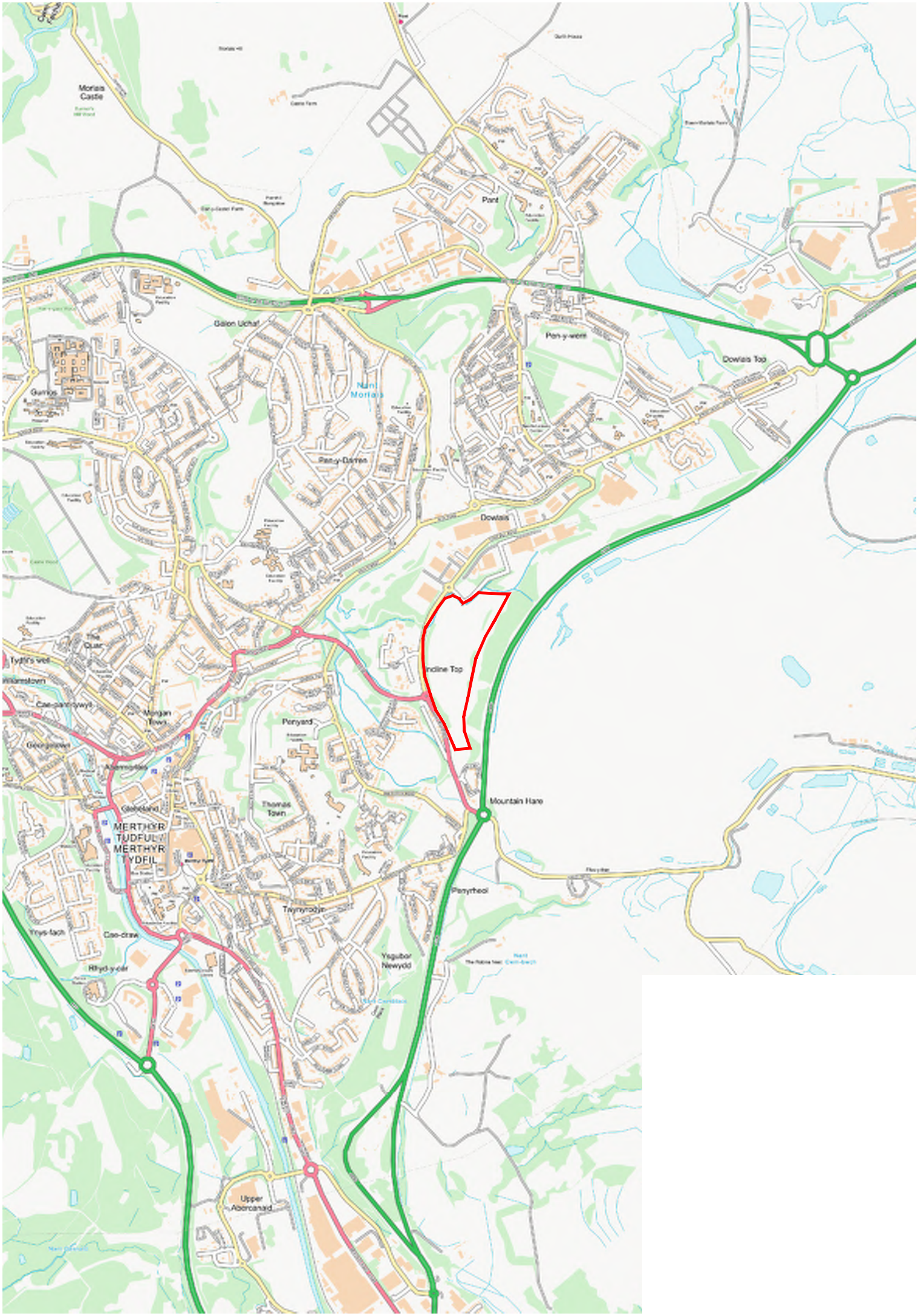

Morlais Castle
Pant
Galon Uchaf
Pen-y-wern
Dowlais Top
Gurnos
Nant Morlais
Pen-y-Darren
Dowlais
The Quar
Tydfil's well
Incline Top
Cae-pant-sywyd
Morgan Town
Penyard
George town
Thomas Town
Mountain Hare
MERTHYR TUDFUL / MERTHYR TYDFIL
Penyrheol
Twynyrodyn
Ynys-fach
Cae-crane
Rhyd-y-car
Ysgubor Newydd
Upper Abercanaid

Figure 2 – Site Investigation Layout Plan: As Built Locations (Post Site Investigation).



KEY

- OPEN HOLE BOREHOLES
- BOREHOLES
- TRIAL PITS

PRELIMINARY ISSUE

Rev	Description	Date	Drn	Chk	App
P01	PRELIMINARY FIRST ISSUE	06.07.262	PP	JC	NEB

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GOAT MILL ROAD

Sheet Title

SITE INVESTIGATION LAYOUT PLAN
(POST SITE INVESTIGATION - AS-BUILT LOCATIONS)

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
784-B077402	PP	06.07.26	JC	06.07.26	NEB	06.07.26	1:2,500	S0

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B077402	TTE	00	XX	DR	U	0003	P01

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TTE_MT_v1

Figure 3 – Superficial Geology Map

N



KEY

SUPERFICIAL GEOLOGY

GLACIAL TILL

0 50 100 150 200 250 m

SCALE 1:5000

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SUPERFICIAL GEOLOGY PLAN

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
784-B077402	CM	12.05.26	JC	12.05.26	-		1:5,000	S0

Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision
B077402	TTE	00	XX	DR	U	0004	P01

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Figure 4 – Bedrock Geology Map