



**FORMER STATION WORKS SITE
BURY ROAD
RADCLIFFE**



**PAUL COOK
DEVELOPMENTS (WHITEHAVEN) LTD
PHASE 2 GROUND INVESTIGATION REPORT**

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Document Verification

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Executive Summary

Site	The site has an area of approximately 0.59 ha and is located to the east of Bury Road in Radcliffe, Manchester. The site is centred near OS grid reference 378943, 407668.
Future Use	The site is intended to be developed for residential use with gardens and parking areas.
Site Works	Ground Investigation (GI) was undertaken over 7 days in July 2022. A total of 11 machine excavated trial pits were dug to a maximum depth of 3.70m below ground level (bgl), 5 cable percussive boreholes were also drilled to a maximum depth of 12.50m bgl of which 2 were followed on by rotary open boreholes carried out to a maximum depth of 50.0m bgl. Standard Penetration Tests (SPTs) were carried out in the boreholes. Soil samples were collected for chemical and geotechnical laboratory testing. BH01, BH02, BH03 and BH04 were reinstated as ground gas/water monitoring wells. Infiltration testing was undertaken within BH01 and BH03.
Ground Conditions	Surface covering of either reinforced concrete slabs, asphalt or hardcore was encountered at ground level (between 69.50m and 70.15m AOD, and Made Ground was found across the entire site to extend to depths between 1.0m and 2.0m bgl. Made Ground generally comprised granular material with gravels included brick, concrete, ash, cinder, charcoal and metal. In the centre of the site, metal stanchions were recorded at ground level and historical foundations were encountered comprising square pad foundations to 1.40m bgl. In the north of the site, historical brick walls and strip foundations were recorded underlying the brick wall from 0.70m to 0.90m bgl. Deeper cohesive Made Ground was generally recorded locally underlying shallow Made Ground across the site. The top of the natural Glacial Till soils was found at between 1.10m and 2.0m bgl comprising interbedded clays and sands/ gravels. At depths below 12.0m, very dense gravels including cobbles and boulders were encountered. Rotary open hole drilling followed on from these depths in BH01A and BH02 through the deeper superficial soils. Rockhead was encountered in the north of the site (BH01A and BH02) at 17.0m to 17.20m bgl comprising grey mudstone containing coal fragments. Intact black coal bands were encountered in BH01A from 47.0m to 48.50m bgl and in BH02 from 46.20m to 47.50m bgl and then deeper a thin band from 48.0m to 48.30m bgl. Groundwater was encountered across the site from depths of 1.0m to 2.70m bgl within the Made Ground and in the shallow superficial gravel. Deeper gravels were also water bearing and a groundwater strike was recorded at 12.0m bgl.
Geotechnical	Strip and trench footings could be considered for parts of the development, depending on the imposed loading and finalised development layout. Foundations should not be founded on Made Ground, soft or loose ground. A minimum foundation depth of 1.0m would be needed and foundations would need to be deepened near trees. However, in practice due to the depth of the existing Made Ground and the presence of underlying soft clays across parts of the site, foundation depths may need to extend deeper at this site to reach a suitable bearing stratum, which may result in buildability issues due to encountering groundwater and the sides of foundation excavations may become unstable. It is also advisable that foundations do not span across cohesive and granular material, to limit the potential for differential settlement, and this may be difficult to achieve given the variability of strata encountered.



	Consideration should therefore be given to the use of ground improvement techniques at this site, such as vibro stone columns, which would improve and unify the capacity of the underlying soils, alternatively piled foundations could be considered. It is expected that Made Ground on site to achieve CBR values of at least 3%. Plate bearing tests would need to be undertaken to confirm this. Suspended slabs are recommended due to the depth of existing Made Ground. For below ground concrete in contact with the Made Ground, such as ground beams, then DS2:AC2 applies, otherwise a lower classification of DS1:AC1 could be applied for below ground concrete only in contact with natural soils.
Coal Mining	Coal recorded at depths of 46.20m and 48.30m bgl was intact suspected to be the Park Yard (Ashclough) Coal. Coal bands are overlain by over 29.0m of rockhead coverage. The considerable depth to relatively thin coal bands with no evidence of workings, broken ground or infilled ground indicate that the risk to the development of unrecorded shallow coal workings is considered to be very low. No further investigation within the Pennine Middle Coal Measures Formation is required.
Contamination	Overall contamination risks are considered to generally range from low to moderate. Due to the presence of heavy metals, PAHs and asbestos in Made Ground, it is recommended a 600mm thick capping layer is installed in all the gardens/ landscaping. Barrier piping may be needed for potable water supply pipes and this should be discussed further with the local potable water supplier. The site is assessed as Characteristic Situation 1 and Green within the NHBC traffic light system. The site does not require ground gas or radon protection measures. Risks to controlled waters are concluded to be low. Risks to construction workers are also considered to be low, providing safe working practices are followed, and appropriate PPE is worn as necessary. Asbestos has been encountered within the Made Ground and presence of further asbestos cannot be discounted. Groundworkers should manage this potential risk as part of their risk assessment and method statements for site development. Localised zones of contaminated material may be found in areas that were not covered by the GI. A watching brief should be kept on-site during construction work for signs of unexpected contamination. If ashy, odorous or apparently contaminated material such as Asbestos Containing Material (ACM) is found on site, this should be tested to check if it is contaminated. If it is found to be contaminated then, after consultation with the regulatory authorities, it should be removed, remediated or capped as appropriate.
Further Work	It is recommended that some plate bearing tests are undertaken on shallow Made Ground following removal of hardstanding to confirm CBR values for roadway design. A Remediation Strategy report should be produced to document the management of residual contamination risks, primarily concerning the installation of a capping layer.

The conclusions and recommendations made within this report should be agreed by the approving bodies, as applicable such as the Local Authority, prior to site development.



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1 Introduction

Westlakes Environmental, as a division of Westlakes Engineering Limited, has been commissioned by Paul Cook Developments (Whitehaven) Limited to undertake a Ground Investigation (GI) on a site located to the east of Bury Road in Radcliffe, Manchester.

A Phase 1 Geo-Environmental Desk Study report (ref TLC1204 dated August 2022) has already been produced for the site by The Land Consultancy Limited. The Desk Study contains a preliminary contamination risk assessment and should be read in conjunction with this Phase 2 GI report to gain a fuller understanding of the site.

The purpose of this report is to interpret the findings of the GI, which included geotechnical and contamination testing. The data has been used to establish the on-site ground conditions, to update the contamination risk assessment and to provide geotechnical recommendations including for foundations and drainage design.

1.1 Site Description

The site is known as the Former Station Works Site and forms a roughly rectangular parcel of land approximately 0.59 ha (5,900m²) in area, located to the east of Bury Road in Radcliffe, Manchester. The site is centred near OS grid reference 378943, 407668 and the nearest postcode is M26 2UA.

A Site Location Plan is presented in Appendix 1.

The site is currently an open parcel of land with areas of concrete or asphalt hardstanding, or demolition rubble hardcore covering the site surface. These areas have recently been used for vehicle storage. There are mature trees lining the western and northern site boundaries, and shrubs and overgrown vegetation are present in the north of the site. The site slopes very gently from the north towards the south, the northern boundary lies at approximately 70.29m AOD sloping south the majority of the site lies at approximately 60.50m AOD.

The site previously contained warehouse buildings which were substantially destroyed by fire in 2012 and the buildings were subsequently demolished. However, it is considered likely that previous substructures remain below the ground surface.

The site surroundings are summarised as follows:

North	Newbridge Close and housing developments are immediately adjacent to the north. Adjacent to the northeast is a small unnamed river, which flows within a manmade channel next to the site. The river runs from Withins Reservoir, which is located approximately 1km north-north-east of the site, (into the River Irwell, which is located approximately 400m to the southeast of the site). The Manchester Bolton and Bury Canal is also located around 225m to the northwest of the site.
East	Large warehouse building, associated with the a vehicle repair and mechanic workshop and residential housing and the small river continues to flow southeast towards a weir where the river enters into a culvert, approximately 25m to the east of the site.
South	Open land used for vehicle parking in association with the vehicle repair and mechanic workshop (discussed above). An Engineering Works (NBS Ltd – precision engineering and gear cutting) is located further south, which includes warehouses to the south of an access road. Residential terraced housing is then present further to the south.
West	Bury Road is immediately adjacent to the west of the site and there are various commercial premises and residential housing across the road from the site. Bury Road Garage, which is a mechanics garage is located at 53 Bury Road, near to the northwest of the site. A petrol station is also located approximately 25m to the northwest of the site.

1.2 Past Uses

The site has most recently been utilised as a freight forwarding depot, where vehicles have been parked.

The site has historically been used as an engineering works formerly known as Station Works, however former building have all been removed following a fire in 2012. In the western part of the site, a large spoil heap of mainly demolition rubble has been left post 2012 after demolition of Station Works buildings.

An electricity substation (formerly located towards the central west of the site), and two above ground tanks (formerly in the far northeast of the site) have been present on site.

Figure 1 shows an extract from OS mapping in 1987 recording the above historical features.

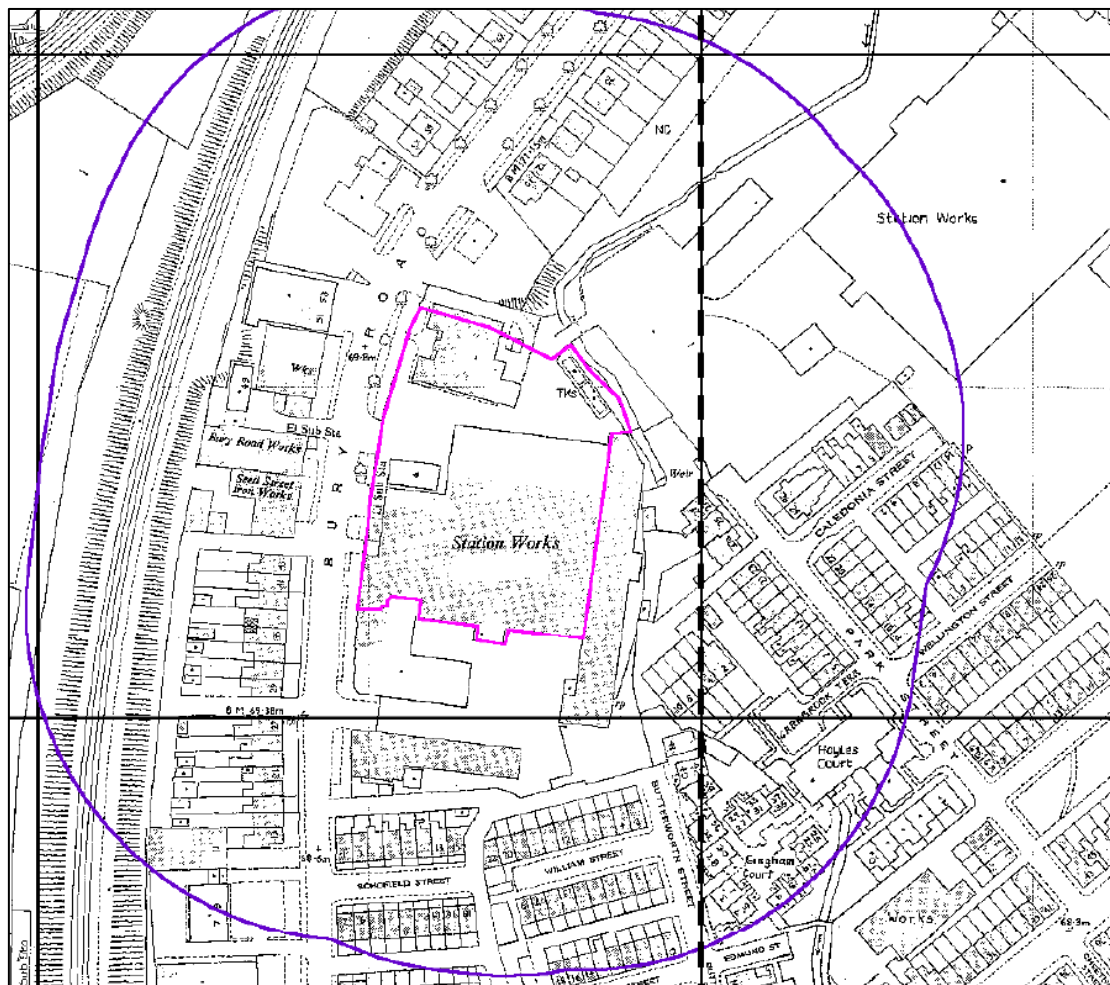


Figure 1: OS Mapping Extract – 1987

1.3 Intended Future Use

The site is intended to be developed with circa 30 residential plots with a proposed new access road, private gardens and car parking including private driveways. Some areas of soft landscaping are also proposed. Typical loading for the proposed residential units is expected to be in the order of 75 to 95 kN/m.

2 Ground Investigation Works

The Ground Investigation (GI) was undertaken to examine the existing ground conditions across the site, taking into account the conclusions and recommendations of the Desk Study Report.

2.1 Westlakes Ground Investigation

The GI was undertaken over 7 days from 18/07/2023 to 27/07/2023. A total of 11 machine excavated trial pits (TP01 to TP11) were dug to a maximum depth of 3.70m below ground level (bgl), 5 cable percussive boreholes (BH01, BH01A to BH04) were also drilled to a maximum depth of 12.50m bgl of which 2 boreholes (BH01A and BH02) were followed on by rotary open drilling carried out to a maximum depth of 50.0m bgl.

The exploratory logs are presented in Appendix 3 and site photographs in Appendix 4.

An extract of the GI Plan is included below in Figure 2, and the full drawing is enclosed in Appendix 2.

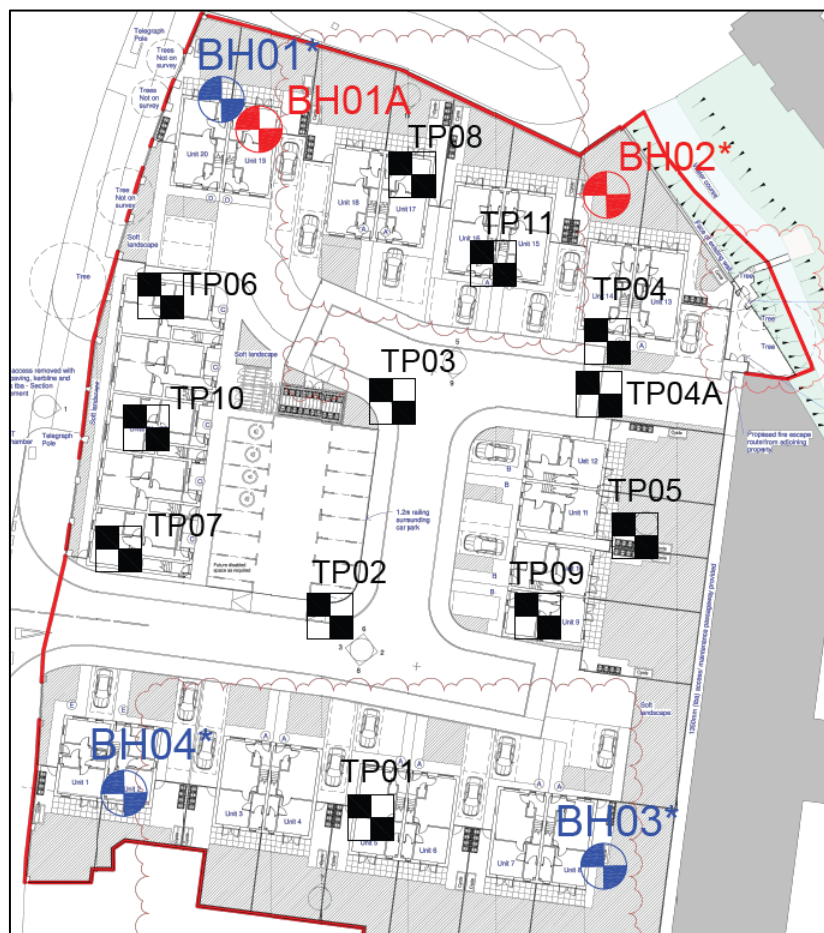


Figure 2: GI Plan

Exploratory hole locations were scanned with a cable avoidance tool and cable percussive boreholes were hand excavated where possible to 1.20m bgl prior to drilling to check for buried services.

BH01, BH02, BH03 and BH04 were reinstated as ground gas/groundwater monitoring wells. A gas monitoring programme, comprising 6 visits over a 3 month period, has been completed and is discussed further in Section 5.7. During one of these visits, samples of groundwater were collected for subsequent chemical testing, and this is discussed in Section 5.5.



2.2 Limitations

Exploratory locations were positioned to enable spatial coverage, geotechnical and geo-environmental assessment of the site, but were also dictated by the need to avoid underground services and obstructions. There was some restricted access at the site due to the presence of stored vehicles on the southern boundary and along the western and northern boundary due to the presence of mature trees.

The GI recorded the presence of in ground obstructions. In the northeastern area of the site, a concrete base was present, and this is assumed to be the plinth on which two historical above ground tanks were recorded on the historical maps in Section 1.2. Due to the proximity to the slope off the site and a brick boundary wall this was not broken out and as such the ground conditions directly underlying this area could not be recorded. BH02 was however drilled adjacent to this area.

Additionally, in the area around one of the circa 24 visible metal stanchions a concrete pad foundation was encountered extending 1.0m away from the stanchion to a depth of 1.40m bgl. Historical strip foundations were also recorded in the north of the site underlying a subsurface brick wall up to 0.90m bgl.

Shallow groundwater strikes were consistent across the site and were recorded between 1.00m and 2.70m bgl, which affected some excavations on the site due to collapsing of the sides of trial pits.

Ground conditions between, beyond or below excavation and sampling points may vary from those stated due to the unpredictable nature of ground and groundwater conditions. All distances, measurements and locations given are approximate.

It is possible that localized zones of contaminated material may be found in areas that were not covered by the GI. A watching brief should be kept on-site during construction work for signs of unexpected contamination. If ashy, odorous or apparently contaminated material such as Asbestos Containing Material (ACM) is found on site, this should be tested to check if it is contaminated. If it is found to be contaminated then, after consultation with the regulatory authorities, it should be removed, remediated or capped as appropriate.

2.3 On-site Testing

To assist with quantifying geotechnical ground properties, in-situ Standard Penetration Tests (SPTs) were undertaken in the cable percussive boreholes at approximately 1.0m intervals where possible to 6.0m bgl. SPTs were undertaken every 1.50m intervals from 6.0m bgl to 10.50m bgl. The SPT results are shown on the logs in Appendix 3 and are discussed in Section 3.

Three infiltration tests were undertaken within both BH01 and BH03 post drilling. The results are presented in Appendix 7 and are discussed in Section 3.

2.4 Laboratory Testing

2.4.1 Geo-environmental

A quantitative programme of contamination testing was scheduled in accordance with the preliminary CSM, which was developed as part of the Desk Study. The testing schedule has also taken into account the encountered ground conditions. Representative (not composite) samples were collected during the site works for subsequent laboratory testing. Accredited MCERTS testing was scheduled where available.

The following chemical laboratory tests were undertaken:

- 18 samples of Made Ground were scheduled for heavy metals, SOM, speciated PAH, VOCs, SVOCs and speciated TPH including BTEX/MTBE.
- 19 samples (14 Made Ground, 1 natural clay, 3 natural sand and 1 natural gravel) were scheduled for pH and BRE sulphate analysis.
- 18 samples of Made Ground were scheduled for electrical conductivity and redox potential.



- 11 samples of Made Ground were scheduled for asbestos identification, one of which was subsequently scheduled for asbestos quantification.
- 3 samples of water (2 from superficial groundwater and 1 surface water sample from the adjacent river) were scheduled for heavy metals, conductivity, speciated PAH, VOCs, SVOCs, speciated TPH including BTEX/MTBE and PFOS and PFOA.

The results of the chemical testing are included in Appendix 6 and are discussed in Section 5.

2.4.2 Geotechnical

The following geotechnical laboratory tests were undertaken:

- 4 samples of natural sand and gravel for Particle Size Distribution (PSD) analysis and three of these included sedimentation using hydrometer.
- 10 samples of natural clay for Atterberg Limits testing.

The results of the geotechnical testing are included in Appendix 5 and are discussed in Section 3.

3 Ground Conditions

Ground conditions are described below based on site observations and the exploratory logs in Appendix 3 and are described in accordance with BS5930. Photographs are also included in Appendix 4.

The ground conditions are discussed in more detail in the following sub-sections and are summarised here.

Stratum	Upper Surface From (m bgl)	Lower Extent To (m bgl)	Thickness (m)
Concrete	Ground Level	0.15 to 1.40	0.15 to 1.40
Asphalt	Ground Level	0.10	0.10
Made Ground	Ground Level	1.00 to 2.00	1.00 to 2.00 ¹
Superficial Clay	1.10 to 3.20	17.00 to 17.20 ²	11.00 to 12.40 ²
Superficial Sand/Gravel	1.00 to 11.00	15.00 to 16.50 ²	3.50 to 4.80 ²
Mudstone	17.00 to 17.20	50.00 ³	31.30 to 31.70 ³
Coal	46.50 to 47.00	48.30 to 48.50	1.30 to 1.50
Groundwater	1.00 to 12.00	N/A	N/A

1 Where base of Made Ground was encountered.

2 Base of superficial soils proven only in BH01A and BH02.

3 Base of mudstone not encountered.

3.1 SPT Data

SPT data collected during the GI has been plotted below and is discussed in the subsequent report sections. For ease of comparison with proposed site levels, all data has been plotted against approximate elevation.

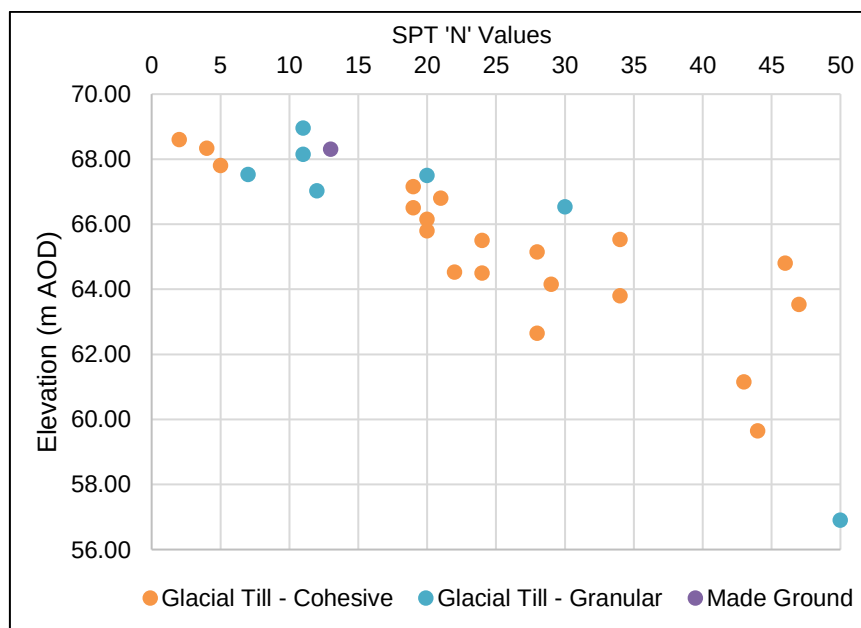


Figure 3: SPT N Values vs Elevation (m above ordnance datum AOD)



It is also noted that gravels and cobbles are present in the superficial soils which may have impacted the results of the test by increasing the N value which would be unrepresentatively higher.

A summary of the results is tabulated here:

SPT Results	Minimum	Maximum	Average	Number of Tests
Made Ground	13	13	-	1
Clay (Superficial Glacial Till)	2	47	26	20
Sand/Gravel (Superficial Glacial Till)	7*	50	11	7

*SPT in BH04 at 2.0m bgl was not fully completed and this result should be used with caution

The SPT results for each ground type are discussed further within the Sections below.

3.2 Surface Covering

Surface covering of reinforced concrete was encountered across the site, which is likely to be the relic floor slab of the previous site buildings. Additional there is evidence of previous stanchions, which have been cut just above surface level and are still visible across the site. The rest of the site was covered by asphalt and hardcore.

As the site has remained derelict for some time, there are large areas of dense overgrown vegetation along the western, northern boundaries and some areas area towards the centre of the site.

3.3 Made Ground

Made Ground was encountered at surface at all locations and extended from ground level to between 1.00m and 2.00m bgl. All locations determined the lower extent of the Made Ground except TP04, which was terminated within the Made Ground upon encountering a buried pipe at 1.4m bgl.

Concrete thicknesses varied across the site; varying from 0.15m thick to 0.30m bgl with two-way reinforcement bar (rebar) between 2mm thick. Asphalt thicknesses varied from 0.10m to 0.15m.

Existing foundations were recorded in TP09, a concrete pad foundation was encountered to 1.40m. Buried concrete was also encountered in the north of the site (TP11) from 0.70m to 0.90m bgl as a strip footing underlying a subsurface brick wall that exists across the northwestern part of the site.

It is expected that more relict foundations would be present under existing metal stanchions across other areas of site.

The Made Ground was encountered as broadly four types:

- A subbase material, approximately 0.05m to 0.10m thick, was encountered underlying surface concrete and asphalt. This comprised whitish brown, sandy gravel. Sand was fine to medium. Gravel was fine to coarse, subangular roadstone, limestone and quartzite.
- Brick and concrete cobbles were encountered from 0.10m bgl up to 1.00m bgl locally in BH01, BH01A, TP08 and TP10. In the region of the historical building in the northern part of the site, this type of Made Ground was found to be thickest and likely backfilled using demolition material from the historical building.
- Granular Made Ground generally underlying subbase material or hardcore encountered between 0.10m up to 2.00m bgl comprised black-brown to dark brown or black gravelly sand or sandy gravel with variable clay and cobble content. Gravels are brick, concrete, ash, cinder, metal, charcoal coal,

sandstone, mudstone and quartzite. Cobbles are brick, concrete and sandstone. Locally in TP06, the gravel exhibited a slight hydrocarbon odour. Locally in TP11, the sand exhibited a sulphurous odour.

- Cohesive Made Ground was encountered generally underlying granular Made Ground from 0.60m to 1.60m bgl comprising orange-brown black to grey sandy gravelly clay with variable silt and cobble content. Gravels are brick, concrete, ash, cinder, metal, charcoal coal, sandstone, mudstone and quartzite. Cobbles are brick, concrete and sandstone. In TP04, an old clay pipe was encountered within the Made Ground, the pipe contained a small amount of water that exhibited a hydrocarbon odour at 1.30m bgl.

One SPT was undertaken in the Made Ground which recorded SPT N value of 13. Made Ground is considered to be variable in strength and composition and therefore the SPT results should be interpreted with caution.

3.4 Superficial Deposits – Glacial Till

Superficial deposits were encountered in all exploratory hole locations beneath the Made Ground with the exception of TP04 which did not progress through the Made Ground.

The upper surface of the superficial deposits was exposed at depths from between 1.00m (TP11) to 2.00m (BH03) and the lower extent was proven in two locations to a maximum depth of 17.20m bgl (BH01A) and to 17.00m bgl (BH02). The other GI positions did not progress beyond these deposits.

British Geological Survey (BGS) 1:10,000 scale mapping indicates that the site is underlain by superficial 'drift' deposits of Glacial Till. The encountered deposits were indicative of Glacial Till, which comprised predominantly cohesive material although granular material was encountered as interbedded stratum.

PSD analyses was undertaken on 1 clay sample (including sedimentation analysis), 1 sand sample (including sedimentation analysis) and 2 gravel samples and the following analysis results were obtained:

BH	Sample Top	Strata	% Cobbles	% Gravel	% Sand	% Silt	% Clay
TP01	2.40	Gravel	8	66	22	4	
TP05	1.80	Gravel	8	66	21	6	
BH02	2.00	Clay	0	18	44	28	10
BH04	2.00	Sand	0	60	22	10	8

The PSD analyses were generally in line with the field descriptions, although there are some apparent variations (the sand and silt content within the gravel strata was lower than recorded within the field descriptions and BH04 at 2.0m bgl is more similar to a clayey sandy gravel than a clayey gravelly sand. BH02 at 2.0m bgl noted a much higher silt content than recorded within the field descriptions and is more similar to a silty slightly gravelly sand than a clay soil.

3.4.1 Cohesive Glacial Till

The cohesive Glacial Till comprised soft to stiff brown to dark brown and grey sandy gravelly clay with variable silt and cobble content becoming very stiff from 4.0m bgl and becoming hard from 6.0m bgl. In BH02 and BH04, from 1.10m to 2.00m bgl very soft clay was recorded.

20 SPTs were undertaken in the clay from 1.20m to 10.95m which respectively recorded SPT N values between 2 and 47 indicating a highly varied strength. However as shown in Figure 3, the clay shows a clear increase of strength with depth (decrease in elevation).

Results of the ten Atterberg Limits testing show the clay to be of low to very high plasticity with between 39% to 99% passing the 425µm sieve. The modified plasticity results indicate that the clay has a low to medium

volume change potential, although one sample (BH04 at 1.40m bgl) is very close to the boundary of high volume change potential (>40%). The plasticity index vs elevation is shown in Figure 4 below.

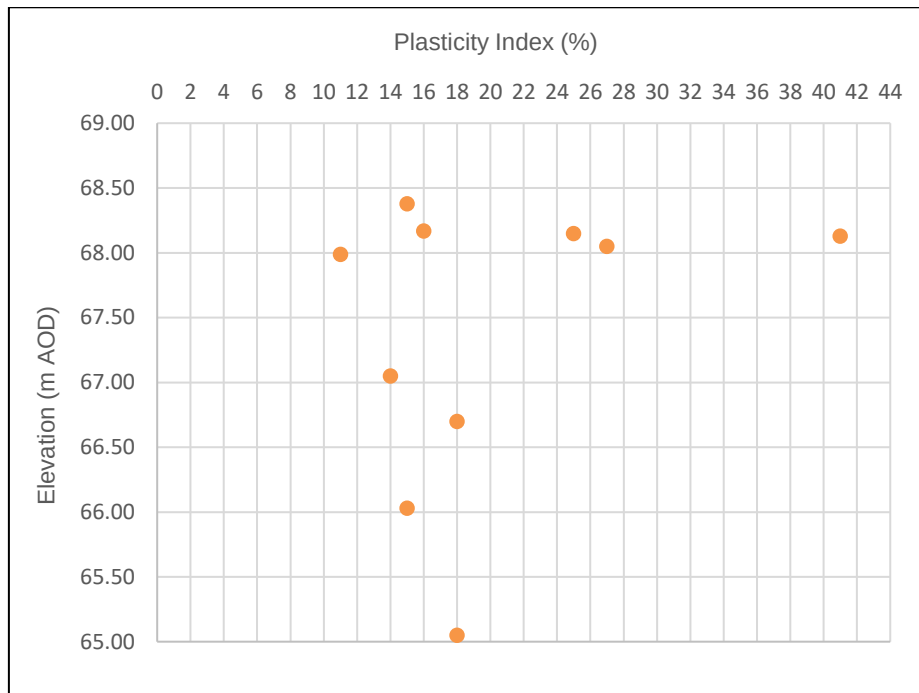


Figure 4: Plasticity Index (%) vs Elevation (m AOD)

Using the relationship between SPT N value and plasticity index, the undrained shear strength (C_u) of the cohesive Glacial Till has been calculated as between 9 kPa and 210 kPa from 1.20m bgl to 10.50m bgl (68.38m to 59.65m AOD). The change in undrained shear strength with elevation (m AOD) is presented in Figure 5.

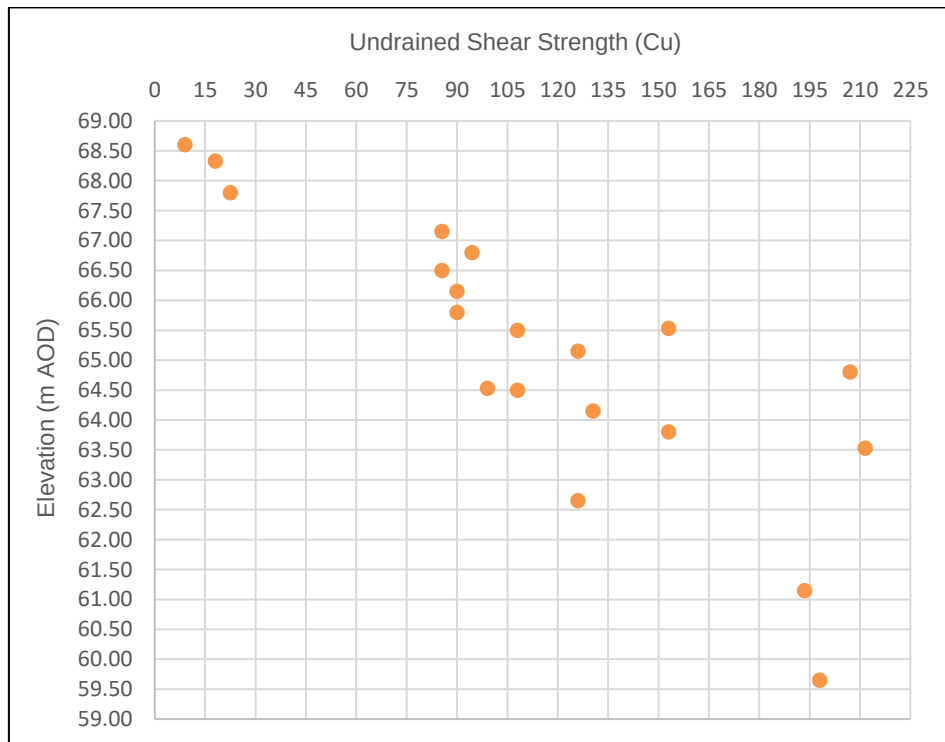


Figure 5: Undrained Shear Strength (kPa) vs Elevation (m AOD)

There is a trend of increased undrained shear strength with depth within the cohesive Glacial Till across the site. There is also a significant increase below 67.50m AOD at which the clay is estimated to have an undrained shear strength consistently greater than 85 kPa indicating high strength clay.

Caution is advised due to the presence of gravel and cobbles within the clay which may lead to higher SPT results and therefore unrepresentatively higher values of C_u . It is also noted that the clay was found to be soft and soft to firm within the trial pits, which would correspond to much lower undrained shear strengths of only 20kPa (lower end of soft) to 50kPa (higher end of soft to firm) from 1.20m to 2.60m bgl.

Using the relationship between SPT N value and plasticity index, the estimated coefficient of volume compressibility of the cohesive Glacial Till has been calculated as between 0.047 mv and 1.11 mv from 1.20m bgl to 10.50m bgl (68.38m to 59.65m AOD). The change in estimated coefficient of volume compressibility with elevation (m AOD) is presented in Figure 6. This shows that there is no real trend in compressibility with elevation, but does indicate that generally cohesive soils underlying the site are of low to medium compressibility. Only two samples are estimated to be of very low compressibility, and three samples of shallow cohesive soils are estimated to be of high compressibility.

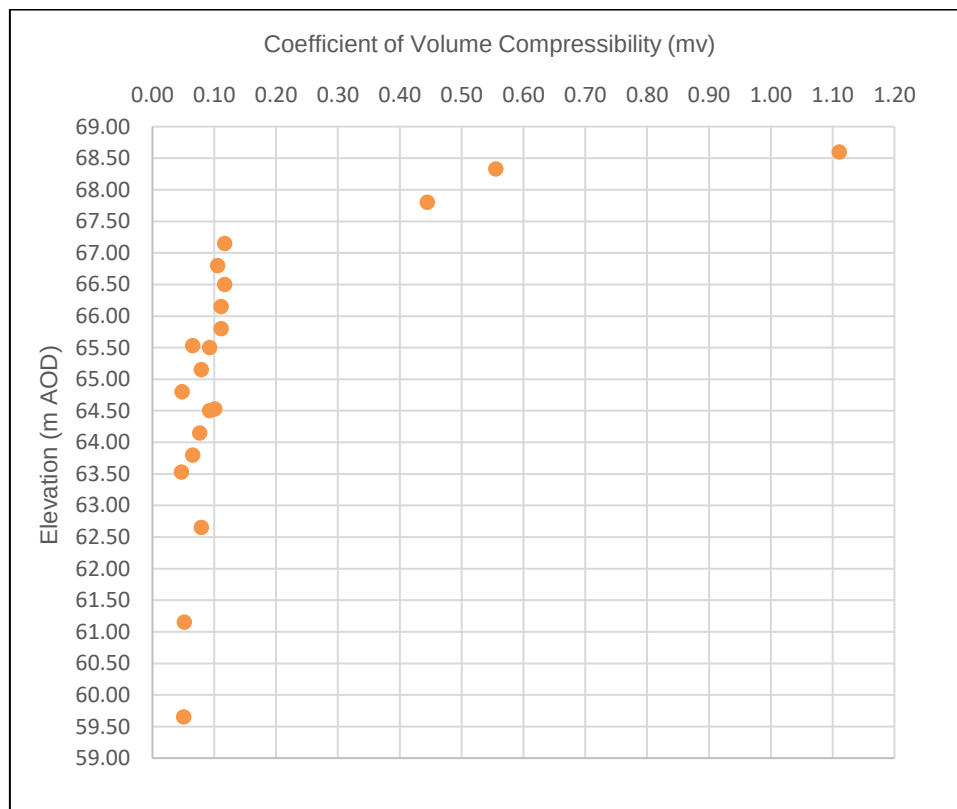


Figure 6: Coefficient of Volume Compressibility (mv) vs Elevation (m AOD)

3.4.2 Granular Glacial Till

Granular Glacial Till was recorded across the site in all exploratory hole locations except TP04 at shallow depths from 1.00m to 3.70m bgl. Deeper granular material was encountered in BH01A and BH02 between 11.0m and 16.50m bgl.

Granular Glacial Till typically comprised gravelly sand or sandy gravel with variable cobble content. The gravels and cobbles included sandstone, mudstone, quartzite and occasionally coal. Very large cobbles were encountered of sandstone and granite in deeper granular material. Seven SPT values were obtained within these strata, 'N' values were recorded ranging from 11 to 50 indicating medium dense to very dense granular material. Shallow sands and gravels between 1.20m and 3.0m bgl were generally recorded to be medium

dense. One SPT was undertaken within deep sand at 12.90m bgl and recorded a refusal. This was later found to be due to a large granite cobble recorded from 12.50m to 13.0m bgl.

Using the relationship between SPT N value and angle of shearing resistance (ϕ), the granular soils underlying the site recorded estimated angle of shearing resistance of approximately 30° within the shallow deposits. The deeper granular deposits recorded an estimated angle of shearing resistance of 42° at 12.90m bgl. The range in estimated angle of shearing resistance with elevation (m AOD) of granular Glacial Till is shown in Figure 7.

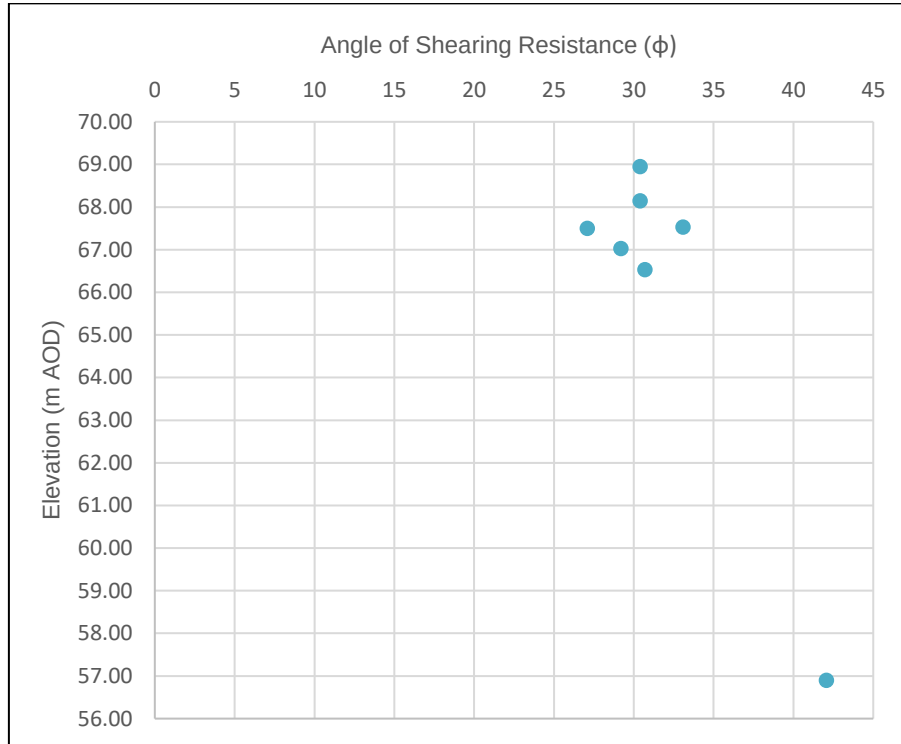


Figure 7: Angle of Shearing Resistance (ϕ) vs Elevation (m AOD)

As shown above, a characteristic conservative value of angle of shearing resistance for the shallow granular soils between 1.20m and 3.0m bgl (69.0m and 66.0m AOD) is estimated to be approximately 30° .

3.5 Pennine Middle Coal Measures

This Section considers the available data pertaining to the Pennine Middle Coal Measures underlying the site and within the local area, initially considering a qualitative assessment of the available desk-based sources of information, and then progressing to a quantitative assessment following GI.

3.5.1 Desk Review of Coal Mining Data

The following information was reviewed :

- A Phase 1 Geo-Environmental Desk Study report (ref TLC1204 dated August 2022)
- BGS Online Geology Viewer
- Coal Authority Interactive Map Viewer
- BGS 1:50,000 scale bedrock map for Manchester (Sheet 85; dated 2010)
- BGS County Series (6-inch scale) bedrock map for Lancashire (95NE; dated 1929)
- Coal Authority Consultants Mining Report (51003303968001; dated 2022)

The BGS lists the solid geology beneath the site as mudstone, siltstone and sandstone of the Pennine Middle Coal Measures Formation. A conjectured NW-SE trending fault (SW downthrow) is positioned across the northeastern corner of the site, which therefore implies that the underlying bedrock may be slightly different beneath the northeast corner of the site compared to the rest of the site.

Following review of the Phase 1 Report, and all available mapping data, it is considered that the following coal seams may be encountered underlying the site.

- In the area to the southwest of the conjectured fault line (i.e. most of the site), the Ashclough Mine Coal (also known as Park Yard Coal) is identified as the shallowest coal seam. The Desk Study suggests that this seam may subcrop below the site at between 23m and 36m below rockhead and is likely to deepen with the dipping strata towards the southeast of the site. The thickness of the Ashclough Mine Coal is unknown. A nearby historic borehole notation of the County Series Map suggests that the Ashclough Mine Seam was previously encountered at 32m depth, therefore the range of values within the Desk Study appears to be appropriate.
- In the area to the northeast of the conjectured fault line (i.e. the northeast corner of the site), the shallowest potential seam is identified as the White Mine Coal (also known as the Foxholes Coal). This seam is stratigraphically close to the underlying Black Mines Coal and the underlying Lower Yard Coal on the County Series Map. The Desk Study suggests that the Lower Yard Coal may subcrop below the site at approximately 25.0m below rockhead. The thickness of these seams is unknown. These strata also dip towards the southeast and would be expected to deepen heading off site towards the east due to the fault positioning.
- Workings (if present) within any seams underlying those already mentioned above are not considering to be within influencing distance of the surface and are therefore not considered further.

The Coal Authority (CA) Consultants Report shows that:

- Historical underground coal mining is recorded close to the site within four distinct coal seams (Roger, DOE, Wigan Five Feet and Cannel). The shallowest workings are recorded at 123m depth. The seams were noted to dip to the southeast at angles of between 6.3 to 9.5 degrees. At these depths, the known historic workings are considering unlikely to influence site development.
-
- The report notes that the site is not indicated to be at risk from unrecorded shallow coal workings.
- No coal mining related remediated sites are listed within at least 50m of the site.
- The CA has not received any coal mining subsidence damage claims within, or within 50m of, the site boundary since at least 1994, when records began.
- No coal mine gas emissions or wastewater treatment schemes are listed within at least 500m.

Considering the above, although the Coal Authority were not aware of any historic shallow workings beneath the site, the geological maps and Phase 1 Desk Study suggest that there may be seams present at shallow depth beneath the site (assumed to be within 30m of the ground surface) and therefore it was concluded that the site would benefit from GI to investigate the potential for shallow working within these identified seams.

3.5.2 Intrusive Ground Investigation

To complete the GI within the Pennine Middle Coal Measures, a Coal Authority Permit was obtained (ref. 26885 dated June 2023) which covered drilling rotary open hole boreholes with water flush medium to 50.0m bgl.

Bedrock was encountered in BH01A and BH02 where the maximum depth of investigation was to 50.00m bgl.



Bedrock comprised bands of red-brown and grey mudstone with coal fragments from 17.0m (BH02) to 17.20m bgl (BH01A).

The original intention was to drill 4 rotary boreholes (one in each corner of the site); however, it became apparent once the first two boreholes had been completed in the north of the site, that continuation of rotary drilling in the south of the site would not be necessary. This was because the encountered seams were not worked and were located at depth, and therefore as the strata dip towards the southeast, the coal seams would have been even deeper within the southerly positions.

Intact black coal bands were encountered in BH01A from 47.0m to 48.50m bgl and in BH02 from 46.20m to 47.50m bgl and then deeper a thin band from 48.0m to 48.30m bgl. No broken ground, mine workings or infilled ground was encountered when drilling through the recorded coal bands. Additionally, no elevated mine gas (carbon monoxide, carbon dioxide, methane, hydrogen sulphide) concentrations were recorded during drilling through the Pennine Middle Coal Measures.

The above ground conditions and recorded geological data and knowledge of the site and its surrounding area have formed part of the below Coal Mining Risk Assessment (CMRA). Any subsequent risks will be listed as part of the outcome of the assessment.

As stated above, BH01A and BH02 were positioned along the northern boundary (where coal subcrops would be up-dip and therefore shallower) and on opposite sides of the conjectured fault line across the northeast corner of the site. BH01A was positioned southwest of the fault and BH02 was positioned just north of the fault. The summary table below illustrates the depth to rockhead, depth to coal seams, thicknesses of coal seams and rockhead coverage in both locations:

Borehole ID	Depth to rock (m bgl)	Depth to coal (m bgl)	Thickness of coal (m)	Rockhead coverage (m)
BH01A (In the northwest corner of the site and therefore south of the fault)	17.20	47.00	1.50	29.80
BH02 (In the northeast of the site and therefore north of the fault)	17.00	46.50	1.00	29.50
		48.00	0.30	

Intact coal was encountered in both locations, with no evidence of worked coal or broken ground.

Additionally, Westlakes had correspondence with the CA to gain any supporting information for the above in the local geological records. The CA confirmed that they were not aware of the thickness of unworked seams in the area, only the thickness of the seams that had been worked which were identified in their report.

CIRIA Report C578D (2019) comments that what is understood as 'acceptable cover' relates to the limit height at which void migration has no appreciable effect on surface subsidence.

Acceptable cover is expressed as ' ht ', where h = the thickness of rock above the shallowest encountered seam and t = the thickness of the worked seam. The published data indicates that the minimum cover for a recorded seam must be $10t$.

As such, where encountered in BH01A and BH02 there is a maximum seam thickness (t) of 1.50m and therefore $10t$ coverage of competent rock would need to be greater than 15.0m. The competent rock cover at the site is well above this at 29.50m.

The risk to development from unrecorded shallow coal workings (<30 m below rockhead level), unrecorded deep coal workings (>30 m below rockhead level), surface subsidence, unrecorded mine entries and elevated mine gases is considered to be very low.



No further investigation into the Coal Measures underlying the site is therefore required.

3.6 Groundwater

Groundwater was encountered during the GI across the site, at a depth of approximately 1.00m to 2.70m bgl. It is considered that perched groundwater is likely to be encountered across parts of the site. There is also evidence of a shallow groundwater table within the superficial soils which was recorded during drilling below 1.20m bgl. Groundwater levels were monitored on the last day of the GI (27/07/2023) in BH01 and BH03 and recorded groundwater at elevations between 1.49m and 2.48m bgl (68.67m and 67.02m AOD).

Groundwater levels were recorded during the 6 monitoring visits within BH01s, BH01d, BH02 and BH03d at depths between 1.00m and 2.88m bgl which is representative of the resting water level within the superficial aquifer. On the second monitoring visit, groundwater was sampled from BH01d, BH03d and the surface water from the adjacent river.

The chemical testing for groundwater is further discussed in Section 5.

3.7 Contamination Observations

The following visual and olfactory signs of potential contamination were noted during the GI:

- In TP02 (just south of the centre of the site), a slight hydrocarbon odour and sheen was noted within groundwater in natural gravel at 2.70m bgl.
- In TP04 (northeast of the site), a slight hydrocarbon odour was noted in water trapped in an old clay pipe at 1.30m bgl.
- In TP06 (northwest of the site), a slight hydrocarbon odour was noted within the Made Ground from 0.25m to 0.70m bgl.
- In TP03 (centre of the site), a slight sulphurous odour was noted within Made Ground from 0.60m to 1.0m bgl.
- In TP11, (north of the site), a slight sulphurous odour was noted within Made Ground from 0.10m to 1.0m bgl.
- Visual contamination was observed across the site, recorded as ash and cinder within gravels in Made Ground between 0.10m and 2.0m bgl.

A sample of natural ground from TP02 at 2.70m bgl, and samples of Made Ground from TP04 at 1.0m bgl, TP06 at 0.30m bgl and TP11 at 0.90m bgl were tested for a range of contamination including TPH, PAH, SVOC and VOC. Additionally multiple samples of Made Ground were tested to target noted visual contamination above for a range of contamination including heavy metals, PAH and TPH. The results are discussed in Section 5.2.

No other visual or olfactory signs of contamination were observed during the GI.

4 Geotechnical Appraisal

This section contains a geotechnical appraisal based on the GI and the proposed residential end-use as described in Section 1.3, assuming maximum unfactored line loads of up to 75 to 90kN.

4.1 Foundations

Made Ground extended to between 1.00m to 2.00m bgl. The Made Ground is not considered to be a suitable founding stratum given the variability in strength and composition. The underlying natural ground was found to comprise Glacial Till of both cohesive and granular deposits, although directly below the Made Ground it is noted that cohesive clays tend to dominate, and these deposits were found to be soft across parts of the site.

Strip and trench footings could be considered for parts of the development, depending on the imposed loading and finalised development layout. Foundations should not be founded on Made Ground, soft or loose ground. A minimum foundation depth of 1.0m would be needed due to the presence of potentially high-volume change clays, and foundations would need to be deepened near to existing and proposed trees in accordance with NHBC Standards. However, in practice due to the depth of the existing Made Ground and the presence of underlying soft clays across parts of the site, foundation depths may need to extend much deeper at this site to reach a suitable bearing stratum. Deepening the foundations may result in buildability issues where groundwater is encountered, and the sides of foundation excavations may become unstable.

It is also advisable that foundations do not span across cohesive and granular material, to limit the potential for differential settlement, and this may be difficult to achieve given the variability of strata encountered.

Consideration should therefore be given to the use of ground improvement techniques at this site, such as vibro stone columns, which would improve and unify the capacity of the underlying soils, alternatively piled foundations could be considered.

4.2 Floor Slabs

The existing Made Ground is relatively deep and of variable composition. The site requires clearance of existing in-ground obstructions prior to foundation placement, although the overall elevation of the site is expected to remain similar to pre-development levels. Ground bearing floor slabs are therefore not recommended due to the thicknesses of Made Ground, which is greater than 600mm.

A suspended ground floor slab is recommended due to the depth of Made Ground.

Radon protective measures and gas protective measures are not considered to be required.

4.3 Roadworks

Roadways are proposed as part of the residential development scheme. Plate bearing tests were not undertaken as part of the GI. However, it is assumed that the existing granular Made Ground could achieve CBR values of at least 5%. Plate bearing tests would be required within the locations of the proposed roadway to confirm this as part of the roadway design.

4.4 Excavation Issues

Perched groundwater was encountered during the GI within the Made Ground and groundwater was encountered in the natural soils at relatively shallow depths. Shallow excavations are expected to encounter this groundwater, which is expected to be manageable via pumping from sumps. Groundwater levels were recorded across the site at depths between 1.00m and 2.88m bgl.

The site has previously been developed, therefore historic building foundations, services and relic structures will certainly be present beneath the site. Particularly in the areas around the visible steel stanchions across the site and within the area of the historical buildings in the northwest of the site. The subsurface extent of the concrete plinth in the northeast of the site was not proven.

Unsupported sides of excavations are likely to become unstable, particularly where groundwater is encountered and within the coarse gravels below 1.50m bgl. The risk of side collapse should be assessed by the contractor (or another appropriate person) when excavating. Where there is a risk of harm from side collapse, then the sides should be supported or battered back to make them safe.

The impact of any excavations, vibrations and construction works on the adjacent land, highways and buildings should be considered as part of the design process and during construction activities.

The site is above a Secondary A Aquifer within the superficial soils and bedrock and this should be taken into account within working practices as part of the Principal Contractor's risk management procedures, particularly when undertaking the groundworks, to protect controlled waters from introduction of contamination during construction works.

4.5 Surface Water Drainage

Infiltration testing was conducted in two locations on the site within borehole monitoring well installations. In accordance with BRE 365, BH01 and BH03 were tested three times by conducting falling head tests. The testing recorded infiltration rates (k) of between 4.19×10^{-6} m/s to 2.77×10^{-5} m/s.

It is however noted that the standing water level within BH01 was recorded at 1.49m bgl and BH03 was recorded at 2.48m bgl. Water was added to raise the head level within the monitoring well and the water level was consistently monitored during the tests. The high standing water levels prior to the test is notable along with the recorded levels of groundwater across the site and the presence of clayey ground. Consequently, it is considered unlikely that soakaways would be feasible at this site.

The disposal of surface water generated by the development will need to be considered as part of the site drainage design however it appears that soakaways would not be feasible and consequently consideration should be given to discharging surface water into the adjacent river and/or into the surrounding public sewer network. Permission will be required from the relevant bodies, and discharge restrictions will also apply.

4.6 Sulphate Precautions

The site is classified as brownfield, water is assumed to be mobile and soil pH was found to be >6.5 in all of the 19 samples tested. The results showed the following:

Stratum	Water Soluble SO ₄ 2:1 Extract (mg/l)	Total Potential Sulphate (TPS) (%)	Classification
Made Ground (14 samples)	0.0085 to 0.56	0.019 to 0.660	DS2:AC2 based on TPS
Glacial Till (5 samples)	0.02 to 0.08	0.019 to 0.096	DS1:AC1 based on WSS and TPS

Oxidisable sulphides were >0.3% in 1 out of the 19 samples, the sample was of Made Ground therefore oxidisable sulphides could be present within Made Ground on the site and therefore the TPS results take precedence over the water soluble results.

The sulphate classification has been assigned considering the number of samples tested and BRE Special Digest 1 guidance. For below ground concrete in contact with the Made Ground then DS2:AC2 applies, otherwise for below ground concrete only in contact with natural soils a lower classification of DS1:AC1 should be applied.

Below ground concrete should be appropriately designed for these classifications.





5 Contamination Appraisal

The contamination appraisal and outcomes of the GI are discussed here.

5.1 Chemical Assessment Values

When assessing the chemical test results, the results were compared with an assessment value. The most appropriate assessment value to use depended on the type of sample being tested (soil, water, leachate) and the receptor (human, plant, water, concrete) at risk from potential contamination. Therefore, different assessment values were used when assessing different receptors.

Initially test results were compared against Generic Assessment Criteria (GAC). Results below the GAC are widely considered to present acceptably low levels of risk. Results above GAC require further assessment as they may present an unacceptable level of risk. This further assessment may take the form of developing Site Specific Assessment Criteria (SSAC) or taking into account other specific factors at this site.

Assessment values used within this investigation are discussed further and contained in Appendix 5.

5.2 Soils – Human Health Assessment

Chemical test results have been compared to GAC for a proposed residential end use with plant uptake using a conservative organic matter of 2.5% for Made Ground and 1% for natural soils.

None of the natural soil samples collected recorded exceedances when compared to the relevant GACs for heavy metals, speciated PAHs and speciated TPHs. Natural ground therefore appears to be uncontaminated.

Concentrations of several heavy metals, speciated PAHs within some Made Ground samples were recorded exceeding the relevant GAC. Five samples of Made Ground recorded exceedances of lead ranging from 220 mg/kg to 460 mg/kg (GAC = 200 mg/kg). Two samples of Made Ground recorded exceedances of Arsenic ranging from 39 to 97 mg/kg (GAC = 37 mg/kg). One sample of Made Ground (BH03 at 0.60m bgl) recorded an exceedance of copper at 5,600 mg/kg (GAC = 2,400 mg/kg).

Five samples of Made Ground recorded species of PAH including Benzo(b)fluoranthene, Benzo(a)pyrene and Dibenzo(a,h)anthracene with exceedances. Benzo(b)fluoranthene concentrations ranged from 3.6 mg/kg to 13 mg/kg (GAC = 3.3 mg/kg). Benzo(a)pyrene concentrations ranged from 2.8 mg/kg to 11 mg/kg (GAC = 2.7 mg/kg) and Dibenzo(a,h)anthracene concentrations ranged from 0.33 mg/kg to 1.7 mg/kg (GAC = 0.28 mg/kg).

No Made Ground samples recorded exceedances when compared to speciated TPH GACs.

All VOCs were <5.0µg/kg which is the limit of detection (LOD), which indicates negligible concentrations. SVOCs (excluding PAHs already discussed) were also generally below or only slightly above the limits of detection, which was 0.05 to 0.3 to mg/kg. The species of SVOCs which recorded concentrations notably above the LOD, between 0.06 and 13.4 mg/kg are part of the 16 PAH fractions already assessed above and as such have not been included in the SVOCs assessment.

Given the generally very low concentrations of other SVOCs combined with the lack of published GACs for some species of SVOC, it is considered that these species do not pose a risk to human health.

Asbestos was positively identified within 1 of the 11 samples of Made Ground. This sample was then tested for full Asbestos quantification and the results are shown below.

Sample Ref	Type of Asbestos Identified	Quantification
BH02, 0.60m, Made Ground	Chrysotile - Bitumen	0.002 %

The Made Ground has recorded local chrysotile in bituminous form.

There are therefore exceedances of contamination levels within some of the Made Ground samples. Some Made Ground is likely to be removed from the site to facilitate development which would consequently reduce



the presence of these contaminants on site. However, most of the Made Ground is expected to remain on site. Much the development site is proposed to be covered by hardstanding/buildings including the access road, private driveways and the residential plot building footprints. This will prevent future site users encountering the underlying soils in these areas, thereby breaking the pathway in the potential pollutant linkage.

However, the development includes private gardens which may be used for growing homegrown produce along the southern boundary, eastern boundary and northern boundary mainly but also with some areas of soft landscaping. Therefore, it is recommended that a 600mm thick capping layer is installed in all the garden areas and any soft landscaping to prevent future site users coming into contact with the remaining Made Ground. The capping layer should be formed from clean imported topsoil/subsoil, meeting the requirements for use within a residential with plant uptake setting. The requirements for the capping layer should be documented within a separate Remediation Strategy Report.

Risks to construction workers are considered to be generally low, providing safe working practices are followed, and appropriate PPE is worn as necessary. However, asbestos has been encountered in limited areas within the Made Ground and presence of further asbestos cannot be discounted. Groundworkers should manage this potential risk as part of their risk assessment and method statements for site development, including the use of dust suppression techniques during groundworks and use of respiratory PPE as needed.

5.3 Soils – Potable Water Supply Assessment

The soil sample results have been compared to the UKWIR assessment values for PVC and PE potable water supply pipes. Five samples of Made Ground were found to contain elevated SVOC fractions above the GAC for PE and PVC piping and additionally one Made Ground sample recorded pH values >8 and positive redox potentials, indicating ground conditions could be corrosive to copper pipes.

PVC or PE pipes may not be suitable if placed within the Made Ground and consideration should therefore be given to the use of barrier piping. This should be confirmed with the local water supplier, United Utilities, and a copy of this report provided for their records.

5.4 Soils – Plant Health Assessment

Concentrations of copper, nickel and zinc, which can be particularly phytotoxic, were compared to plant health GAC. Two samples of Made Ground (BH03 at 1.0m and TP09 at 0.40m bgl) exceeded the relevant GAC for copper. Risk to plant health from the soils on site is considered to be moderate. There is however no existing topsoil on site and a capping layer is needed in any case for human health reasons as discussed in Section 5.2. This capping layer is expected to provide a suitable growing medium for plants.

Advice should be sought from a landscape architect regarding the topsoil depths required for plant growth, as these would be dependent upon the plant species.

5.5 Controlled Waters Assessment

Groundwater was encountered during the GI across the site, at a depth of approximately 1.00m to 2.70m bgl. It is considered that perched groundwater is likely to be encountered across parts of the site. There is also evidence of a shallow groundwater table within the superficial soils which was recorded during drilling below 1.20m bgl. Groundwater levels were monitored on the 27/07/2023 in BH01 and BH03 and recorded groundwater at elevations between 68.67m and 67.02m bgl.

During the second groundwater level monitoring visit, groundwater samples were collected from BH01d at 1.85m bgl, BH03d at 2.77m bgl and also of surface water from the river adjacent to the northeast of the site.

The site overlies Glacial Till recorded as Secondary A Aquifer and the bedrock, underlying the superficial soils, of Pennine Middle Coal Measures is recorded as Secondary A Aquifer.

The site is not recorded within a Source Protection Zone, and no potable groundwater abstraction are recorded within influencing distance from the site. As such, the following controlled waters assessment will not



considered UK Drinking Water Standards as a GAC. The Environmental Quality Standards (EQS) for freshwater have been used to assess the risk to controlled waters.

A small culverted river lies adjacent to the northeastern boundary of the site, this flows to the southeast and is a tributary of the River Irwell. The river is mostly culverted below ground although it is within an open concrete channel adjacent to the northeast of the site. The concrete channel will therefore significantly limit the potential pathway for any potential site sourced contaminants to interact with river waters.

There are two identified receptors when considered the risk to controlled waters. Firstly, the superficial Glacial Till Secondary A aquifer and secondly the surface water receptor of the river adjacent to the site.

Based on review of the results of the leachate analysis on 4 samples of Made Ground and the groundwater and surface water chemical analysis. The results, when compared to the EQS (freshwater) GACs, indicate there are no exceedances for heavy metals, PAHs, TPHs including BTEX/MTBE, VOCs and SVOCs, with the exception of chromium and copper which are discussed in turn below.

The LOD for the leachable chromium (III) analysis is $<5.0 \mu\text{g/l}$ which greater than the EQS (long term) GAC of $3.4 \mu\text{g/l}$ which means that all samples exceed the GAC, however because this is due to the LOD of the testing method, the results are not considered to be significant and as such chromium exceedance can be discounted.

Leachable levels of copper were recorded in all four samples concentrations of between 25 and $44 \mu\text{g/l}$ compared to the EQS GAC of $1 \mu\text{g/l}$ when bioavailable. The Made Ground could theoretically be a potential source of leachable copper. The chemical analysis recorded copper concentrations of 3.7 to $3.9 \mu\text{g/l}$ in superficial groundwater and of $7 \mu\text{g/l}$ in the surface water collected from the river. This shows the concentrations of copper within the groundwater are much lower than the leachable levels indicating that the pathway to the groundwater aquifer receptors has been sufficiently retarded probably by natural low permeability clay soils across the site. The concentrations of copper within the surface water is nearly twice that of the concentrations recorded within the natural groundwater samples from within the site and it is therefore possible that copper is simply elevated within the local area as it is a naturally occurring contaminant. It is also noted that the copper EQS for freshwater is very low and conservative. Considering the above, and the potential limited pollutant linkages, the risk from leachable copper is not considered to be significant and is therefore not considered any further within this assessment.

The two groundwater samples from BH01d and BH03d recorded PAHs, TPHs including BTEX/MTBE, VOCs and SVOCs and PFOS and PFOA below the noted limit of detection (0.01 to $10 \mu\text{g/l}$). This indicates that the natural groundwater underlying the site has generally very low to negligible levels of such contamination.

Some Made Ground will be removed from the site during the site clearance and formation of a capping layer in garden and landscaped areas. There will consequently be a reduction in Made Ground and therefore the source of potential residual contamination on site is reduced.

Very low to low concentrations of potential source contamination were recorded in leachable levels within the Made Ground on site and within the natural groundwater on the site. The Made Ground is underlain by predominantly relatively impermeable cohesive Glacial Till. There is limited source contamination and an inhibited pathway as the cohesive material will protect and further limit downward migration of contamination towards the superficial aquifer and the adjacent river which is either fully culverted or in a concrete lined open channel.

Based on the above, the risks to controlled water are considered to be low.

5.6 Waste Classification

Classification of soils for landfill disposal will need to be considered as part of the construction works.

WAC analysis has not been undertaken. All the test results should be considered together to inform the representative disposal classification of soils. WAC analysis should be carried out for disposal to landfill.

It is recommended that, as far as is practical, waste is segregated prior to disposal so that inert, SNRHW non-hazardous and hazardous soils can be separated to minimise disposal costs.

5.7 Ground Gas

On-site Made Ground was identified as a potential source of ground gas, along with the potential for migration of ground gases from Made Ground within the surrounding area. Six monitoring wells were installed as follows:

Location	Approx. Depth of response zone (m bgl)	Stratum	Groundwater depth range (m bgl)
BH01s	0.50 – 1.50	Made Ground	1.15 – 1.52
BH01d	1.50 – 5.00	Natural Sand/Gravel	1.48 – 1.80
BH02	0.50 – 1.50	Made Ground	1.00 – 1.66
BH03s	0.50 – 2.00	Made Ground	Dry
BH03d	2.50 – 3.50	Natural Sand/Gravel	2.66 – 2.88
BH04	0.50 – 1.40	Made Ground	1.00 – Dry

A programme of 6 ground gas monitoring visits were undertaken over a 3 month period in accordance with CIRIA Guide C665 between 9th August 2023 and 6th October 2023, over a range of atmospheric pressures (1001 mbar to 1022 mbar). Wells were allowed to equilibrate with their surroundings prior to commencement of the gas monitoring programme.

During each monitoring visit, the atmospheric pressure, flow rate, methane, carbon dioxide and oxygen concentrations were recorded, along with the groundwater level.

The full gas monitoring results are enclosed in Appendix 7 and are summarised here.

- Recorded gas flow rates ranged between <0.1 and +0.4 litres/hour (l/hr) over the monitoring period.
- Methane was not detected in any exploratory holes across the monitoring programme and as such is considered to be a very low level of risk to the site and is not considered further within this assessment.
- The highest recorded carbon dioxide concentration was 5.8% by volume, recorded in BH02 when the atmospheric pressure was 1016mb.
- The Gas Screening Value (GSV) for carbon dioxide has been calculated to be 0.0232 l/hr, using the highest recorded data (flow of 0.4 l/hr and a max concentration of 5.8%). This places the site within Characteristic Situation 1 (CS1) for carbon dioxide, or using the NHBC traffic light system the GSV would be between the green-amber classification.
- In accordance with C665 and NHBC guidance, consideration has been given as to whether to increase the site classification to Characteristic Situation 2 / the amber classification due to the detection of some carbon dioxide concentrations that were greater than 5%. It is noted that only readings from BH02 were marginally above 5% with the highest concentration being 5.8%. Multiple lines of evidence have been considered including the other gas readings, which were all below 5% with the exception of those from BH02, the typical low flow rates, the lack of biodegradable materials within the Made Ground, and the fact that much of the Made Ground would be removed from site as part of the site development.

Based on the gas monitoring and multiple lines of evidence approach it is concluded that the site is classified as CS1 and “Green” under the NHBC system and therefore does not require gas protection measures.



The site is not in a radon affected area as less than 1% of properties are above the action level. Therefore, radon protective measures are not considered to be required. This is based on assessments by the Health Protection Agency. This should be confirmed with the Local Authority as part of the development process.

6 Conclusions and Recommendations

The GI was undertaken in July 2023. A total of 11 machine excavated trial pits were dug to a maximum depth of 3.70m below ground level (bgl), 5 cable percussive boreholes were drilled to a maximum depth of 12.50m bgl, of which 2 were followed on by rotary open boreholes carried out to a maximum depth of 50.0m bgl.

Made Ground was found across the site to a maximum depth of 2.00m bgl but was generally encountered between 1.0m bgl and 1.60m bgl (69.15m and 67.90m AOD). The site was covered in large areas of concrete and there were also significant obstructions across the site comprising buried concrete foundations and brick walls from historical buildings up to 1.50m bgl.

Made Ground was underlain by superficial soils indicative of Glacial Till comprising predominantly cohesive soft to firm clay deposits with interbedded sandy gravel or gravelly sand from 1.40m bgl (68.11m AOD). Where encountered clay was recorded becoming stiff below 3.0m bgl (67.0m AOD). Locally in the northwest and southeast of the site (BH01, BH01A, TP10 and BH03), Made Ground is underlain by granular Glacial Till comprising medium dense sand and gravel from 1.20m bgl (68.95m AOD).

Granular Glacial Till was also encountered as bands of sandy gravel variable cobble content within deeper clay at depths between 11.00m bgl and 16.50m bgl (58.80m and 53.65m AOD). Bedrock comprised bands of red-brown and grey mudstone with coal fragments was encountered from 17.0m to 17.20m bgl. Intact black coal bands were encountered in BH01A from 47.0m to 48.50m bgl and in BH02 from 46.20m to 47.50m bgl and then deeper a thin band from 48.0m to 48.30m bgl.

6.1 Geotechnical

The site is intended to be developed for low rise residential end-use as, assuming maximum unfactored line loads of up to 75 to 90kN.

Made Ground extended to between 1.00m to 2.00m bgl. The Made Ground is not considered to be a suitable founding stratum given the variability in strength and composition. The underlying natural ground was found to comprise Glacial Till of both cohesive and granular deposits, although directly below the Made Ground it is noted that cohesive clays tend to dominate, and these deposits were found to be soft across parts of the site.

Strip and trench footings could be considered for parts of the development, depending on the imposed loading and finalised development layout. Foundations should not be founded on Made Ground, soft or loose ground. A minimum foundation depth of 1.0m would be needed due to the presence of potentially high-volume change clays, and foundations would need to be deepened near to existing and proposed trees in accordance with NHBC Standards. However, in practice due to the depth of the existing Made Ground and the presence of underlying soft clays across parts of the site, foundation depths may need to extend much deeper at this site to reach a suitable bearing stratum. Deepening the foundations may result in buildability issues where groundwater is encountered, and the sides of foundation excavations may become unstable.

It is also advisable that foundations do not span across cohesive and granular material, to limit the potential for differential settlement, and this may be difficult to achieve given the variability of strata encountered.

Consideration should therefore be given to the use of ground improvement techniques at this site, such as vibro stone columns, which would improve and unify the capacity of the underlying soils, alternatively piled foundations could be considered.

The risk to development from unrecorded deep coal workings (>30 m below rockhead level), unrecorded shallow coal workings (<30 m below rockhead level), surface subsidence, unrecorded mine entries and elevated mine gases is considered to be very low.

A suspended floor slab is recommended as the thicknesses of Made Ground was greater than 600mm.

The site is not within a radon area and consequently radon protection is unlikely to be required however this should be confirmed with the Local Authority.



For below ground concrete in contact with the Made Ground, then DS3:AC3 applies, otherwise the lower classification of DS1:AC1 should be applied for concrete only in contact with natural soils.

Perched groundwater was encountered during the GI within the Made Ground and groundwater has been encountered at relatively at shallow depths. Shallow excavations are expected to encounter this groundwater, which is expected to be manageable via pumping from sumps.

6.2 Geo-environmental

Concentrations of several heavy metals, speciated PAHs within some Made Ground samples were recorded exceeding the relevant GAC (residential with plant uptake). Asbestos fibres were recorded in the Made Ground in one location (BH02 at 0.60m bgl) at 0.002%.

Overall contamination risks are considered to range from low to moderate.

The development includes private gardens and soft landscaping. It is recommended that a 600mm thick capping layer is installed in all the garden areas and any soft landscaping to prevent future site users coming into contact with the remaining Made Ground. The capping layer should be formed from clean imported topsoil/subsoil, meeting the requirements for use within a residential with plant uptake setting. This should be documented further within a Remediation Strategy report.

PVC or PE pipes may not be suitable if placed within the Made Ground and consideration should therefore be given to the use of barrier piping. This should be confirmed with the potable water supplier.

The site is classified as Characteristic Situation 1 (CS1) and as Green under the NHBC traffic light system and therefore gas protective measures are not required. Radon protective measures are also not needed.

Risk to controlled waters are considered to be low.

Asbestos was detected at low concentrations in the Made Ground in one location. Presence of additional areas of asbestos cannot be discounted. Construction workers should follow appropriate working practices and adopt the use of PPE as needed. The contractor's risk assessment and method statement, and subsequent working practices at the site, should account for this possibility. Asbestos awareness training should be provided as a minimum to ground workers, and a management system put in place to evaluate asbestos risk and potentially escalate precautions to control any exposure to asbestos, in line with the Control of Asbestos Regulations. Provided safe and appropriate working practices are adhered to on-site, including use of appropriate PPE, the risks to construction workers should be generally low.

Localised zones of contaminated material may be found in areas that were not covered by the GI. A watching brief should be kept on-site during construction work for signs of unexpected contamination. If ashy, odorous or apparently contaminated material such as Asbestos Containing Material (ACM) is found on site, this should be tested to check if it is contaminated. If it is found to be contaminated then, after consultation with the regulatory authorities, it should be removed, remediated or capped as appropriate.

The conclusions and recommendations made within this report should be agreed by the approving bodies, as applicable such as the Local Authority prior to site development.



7 References

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- BS 5930:2015+A1:2020. Code of Practice for Ground Investigations. British Standards Institution (BSI). 2020.
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- BS EN 1997-1: 2004. Eurocode 7: Geotechnical Design. Part 1: General Rules. Incorporating corrigendum February 2009. BSI. Jan 2010. & NA to BS EN 1997-1: 2004. UK National Annex to Eurocode 7: Geotechnical Design - Part 1: General Rules. Incorporating corrigendum No 1 2007. BSI. Dec 2007.
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- Design Manual for Roads and Bridges. HD 39/01. Footway Design. 2001.
- Environment Agency Guidance on Requirements for Land Contamination Reports. Environment Agency. July 2005.
- Land Contamination Risk Management (LCRM). UK Government Website www.gov.uk. 2021.
- The LQM/CIEH S4ULS for Human Health Risk Assessment. Land Quality Press. 2015.
- The Soil Code. Code for Good Agricultural Practice for the Protection of Soil. MAFF 1998.
- SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document. DEFRA. December 2014.
- United Kingdom Water Industry Research (UKWIR) Report 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' 2011.
- Waste (England and Wales) Regulations. 2014.

Appendix 1 – Site Location Plan



Approximate site boundary shown in pink.

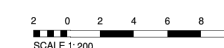
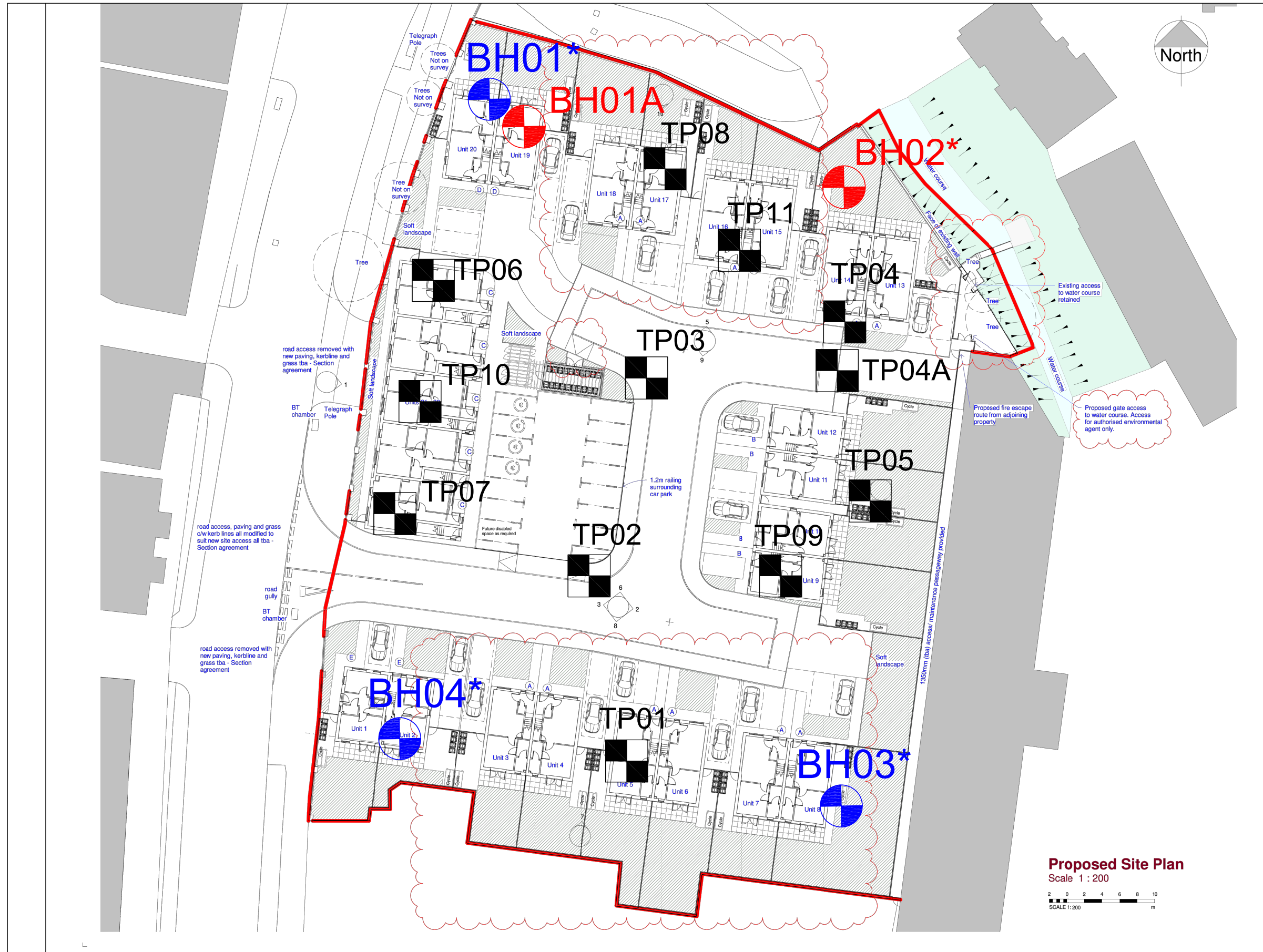
Modified extract from Envirocheck report. Westlakes OS Licence. North is to top of page.



Appendix 2 – Ground Investigation Plan

1. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM SURVEY.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS TOGETHER WITH THEIR SPECIFICATIONS.
4. DO NOT SCALE FROM THIS DRAWING, ONLY WRITTEN OR CALCULATED DIMENSIONS TO BE USED.
5. BASE PLAN 'SI-00-DR-A-1001P - PROPOSED SITE PLAN' BY 'JENKINS DESIGN' ISSUED 04/07/2023.

- 
CABLE PERCUSSIVE BOREHOLE
WITH ROTARY OPEN HOLE FOLLOW ON UP
TO 50.0M BGL UNDERTAKEN ON 19/07/23 -
26/07/23
* DENOTES MONITORING WELL
- 
CABLE PERCUSSIVE BOREHOLE
UP TO 6.45M BGL UNDERTAKEN ON 19/07/23 -
26/07/23
* DENOTES MONITORING WELL
- 
MACHINE EXCAVATED TRIAL PIT
LOCATIONS UP TO 3.70M BGL UNDERTAKEN
ON 18/07/23 - 19/07/23



P1	14/08/23	ISSUED FOR PRELIMINARY INFORMATION					TW	HB	HB
Rev	Date	Revision Details					By	Chkd	Appd
 Westlakes Engineering									
Client PAUL COOK DEVELOPMENTS (WHITEHAVEN) LTD									
Project STATIONS WORKS, BURY ROAD RADCLIFFE									
Title GROUND INVESTIGATION PLAN									
Drawing No. WL_2300__002							Revision P1		
Scale		NOT TO SCALE			Date		AUGUST 2023		
Drawn		TW		Chk		HB		App	
Unit 2.1, 20 Dale Street, Manchester. M1 1EZ									
Tel. 0161 236 8203									



Appendix 3 – Exploratory Logs

Borehole Log

Borehole No.

BH01

Sheet 1 of 1

Project Name: Station Works

Project No.
2300

Co-ords: -

Hole Type
BH

Location: Bury Road, Radcliffe

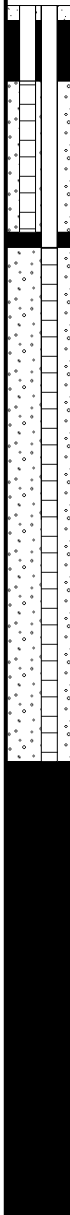
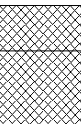
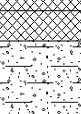
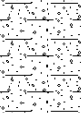
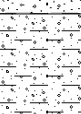
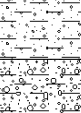
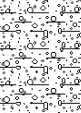
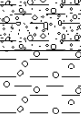
Level: 70.15

Scale
1:50

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 20/07/2023

Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	ES		0.30	69.85		MADE GROUND: Dark brown, very gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, coal, mudstone and sandstone. Occasional cobbles of brick and concrete. MADE GROUND: Brick and concrete cobbles.	1
		1.20 1.30 1.50 - 2.00	ES B	N=11 (1,2/2,3,4,2)	1.00 1.20	69.15 68.95		MADE GROUND: Orange-brown, clayey gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, ash, charcoal, coal, mudstone and sandstone.	
		2.00		N=11 (1,2/2,2,3,4)				Medium dense, brown, slightly clayey slightly gravelly SAND. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
		3.00 3.00 - 3.45	D	N=19 (1,2/3,4,6,6)	2.80	67.35		Stiff, grey, sandy gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	3
		4.00		N=20 (2,2/3,3,7,7)	4.00	66.15		Very stiff, dark brown, slightly sandy gravelly CLAY with low cobble content. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	4
		5.00		N=28 (3,4/6,7,7,8)					5
		6.00		N=29 (6,5/6,7,8,8)					6
		7.50		N=28 (3,4/4,8,8,8)	7.50	62.65			7
					8.00	62.15		Hard, dark brown, gravelly CLAY with low cobble content. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite. End of borehole at 8.00 m	8
									9
									10

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 8.0m bgl aborted due to broken casing stuck in borehole. Groundwater encountered at 1.20m bgl on 19/07/2023. Resting water level recorded on 20/07/2023 at 3.20m bgl. On 26/07/2023, resting water level recorded at 1.48m bgl. Borehole reinstated with dual ground gas/water monitoring well; within Made Ground to 1.50m bgl and within natural gravel to 5.0m bgl.

Borehole Log

Borehole No.

BH01A

Sheet 1 of 2

Project Name: Station Works

Project No.
2300

Co-ords: -

Hole Type
BH

Location: Bury Road, Radcliffe

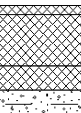
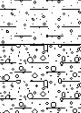
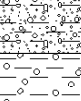
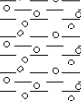
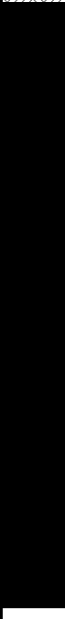
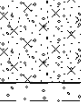
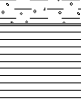
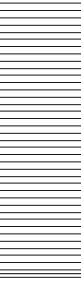
Level: 70.15

Scale
1:125

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 21/07/2023

Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15	70.00		MADE GROUND: Dark brown, very gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, coal, mudstone and sandstone. Occasional cobbles of brick and concrete.	1
					1.00	69.15			
					1.40	68.75		MADE GROUND: Brick and concrete cobbles.	2
					2.50	67.65		MADE GROUND: Orange-brown, clayey gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, ash, charcoal, coal, mudstone and sandstone.	3
					3.20	66.95			
					4.00	66.15		Brown, slightly clayey slightly gravelly SAND. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	4
					6.00	64.15		Yellow brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	6
								Becoming clayey from 3.0m to 3.20m bgl.	7
								Firm to stiff, brown-grey, sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	8
		9.00		N=43 (1,5/7,9,11,16)				Very stiff, dark brown, slightly sandy gravelly CLAY with low cobble content. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	9
								Hard, dark brown, gravelly CLAY with low cobble content. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	10
		10.50		N=44 (6,6/12,9,10,13)				Large sandstone boulder at 6.0m bgl. Rotary open hole follow-on from 10.95m bgl.	11
									12
					13.50	56.65		Brown, silty gravelly SAND. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	14
									15
					16.50	53.65		Brown, gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	16
					17.20	52.95		Red-brown, MUDSTONE with coal fragments. No elevated ground gas concentrations were recorded whilst drilling through Coal Measures.	17
									18
									19
									20
									21
									22
					23.00	47.15		Grey, MUDSTONE with coal fragments.	23
									24
									25

Continued on next sheet

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 10.95m bgl and followed on with rotary open hole drilling to 50.0m bgl. Groundwater encountered at 1.20m bgl. Rockhead encountered at 17.20m bgl comprised red-brown to grey mudstone. Intact black coal seam recorded from 47.0m to 48.50m bgl. Borehole reinstated with bentonite to 15.0m bgl and with arisings to ground level.

Borehole Log

Borehole No.

BH01A

Sheet 2 of 2

Project Name: Station Works

 Project No.
2300

Co-ords: -

 Hole Type
BH

Location: Bury Road, Radcliffe

Level: 70.15

 Scale
1:125

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 21/07/2023

 Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									26
									27
									28
									29
									30
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40
									41
									42
									43
									44
									45
									46
					47.00	23.15		Black, intact COAL. <i>No broken ground, voids or backfilled ground was encountered whilst drilling through coal seam.</i>	47
					48.50	21.65		Grey, MUDSTONE with coal fragments.	48
									49
					50.00	20.15		----- End of borehole at 50.00 m -----	50

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 10.95m bgl and followed on with rotary open hole drilling to 50.0m bgl. Groundwater encountered at 1.20m bgl. Rockhead encountered at 17.20m bgl comprised red-brown to grey mudstone. Intact black coal seam recorded from 47.0m to 48.50m bgl. Borehole reinstated with bentonite to 15.0m bgl and with arisings to ground level.

Borehole Log

Borehole No.

BH02

Sheet 1 of 2

Project Name: Station Works

Project No.
2300

Co-ords: -

Hole Type
BH

Location: Bury Road, Radcliffe

Level: 69.80

Scale
1:125

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 26/07/2023

Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.60	ES		0.10	69.70		MADE GROUND: Asphalt.	
					0.15	69.65		MADE GROUND: Whitish brown, sandy gravel.	
		1.20		N=2 (0,1/0,1,0,1)	0.40	69.40		Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite	
		1.20 - 1.65	D		1.10	68.70		(SUBBASE).	
		2.00		N=5 (2,2/1,1,1,2)				MADE GROUND: Red-brown, sandy gravel with low cobble content. Sand is fine to medium.	
		2.00 - 2.45	D		2.30	67.50		Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone.	
		3.00		N=21 (3,3/4,5,6,6)	3.00	66.80			
		4.00		N=20 (2,2/3,4,7,6)				MADE GROUND: Grey-black, slightly sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, ash, charcoal, coal, mudstone and sandstone.	
		5.00		N=46 (5,6/8,8,15,15)	5.00	64.80		Soft, orangish brown and grey, slightly silty sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
		6.00		N=34 (5,4/6,9,9,10)				Firm, brown, sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
								Very stiff, dark brown, slightly sandy gravelly CLAY with low cobble content. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	
					11.00	58.80		Hard, dark brown, gravelly CLAY with low cobble content. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	
					11.50	58.30		Yellow-brown, coarse GRAVEL with high cobble content. Gravel is subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	
					12.00	57.80		Hard, dark brown, gravelly CLAY with low cobble content. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Cobbles of sandstone and quartzite.	
		12.90		50 (25 for 75mm/50 for 75mm)				Brown, slightly clayey slightly gravelly SAND. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
					15.00	54.80		Large granite boulder from 12.50m to 13.0m bgl.	
					17.00	52.80		Brown, gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
								Red-brown, MUDSTONE with coal fragments.	
								No elevated ground gas concentrations were recorded whilst drilling through Coal Measures.	
									
									
									
									
									
									
									

Continued on next sheet

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 13.00m bgl and followed on with rotary open hole drilling to 50.0m bgl. Groundwater encountered at 2.0m bgl and 12.0m bgl. On 24/07/2023, water level at 10.0m bgl. Rockhead encountered at 17.00m bgl comprised red-brown to grey mudstone. Intact black coal seam recorded from 46.20m to 47.50m bgl and a thin seam from 48.0m to 48.30m bgl. Borehole reinstated with bentonite to 15.0m bgl. Borehole reinstated with ground gas/water monitoring well within Made Ground to 1.20m bgl.

Borehole Log

Borehole No.

BH02

Sheet 2 of 2

Project Name: Station Works

 Project No.
2300

Co-ords: -

 Hole Type
BH

Location: Bury Road, Radcliffe

Level: 69.80

 Scale
1:125

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 26/07/2023

 Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
									26
									27
									28
									29
									30
									31
									32
									33
					33.50	36.30		Brown, MUDSTONE with coal fragments.	34
									35
									36
									37
					37.50	32.30		Grey, MUDSTONE with shale bands and coal fragments.	38
									39
									40
									41
									42
									43
									44
									45
									46
					46.50	23.30		Black, intact COAL.	47
					47.50	22.30		No broken ground, voids or backfilled ground was encountered whilst drilling through coal seams.	48
					48.00	21.80		Grey, MUDSTONE with coal fragments.	49
					48.30	21.50		Black, intact COAL.	50
								No elevated ground gas concentrations were recorded whilst drilling through Coal Measures.	
								Grey, MUDSTONE with coal fragments.	
					50.00	19.80		----- End of borehole at 50.00 m -----	

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 13.00m bgl and followed on with rotary open hole drilling to 50.0m bgl. Groundwater encountered at 2.0m bgl and 12.0m bgl. On 24/07/2023, water level at 10.0m bgl. Rockhead encountered at 17.00m bgl comprised red-brown to grey mudstone. Intact black coal seam recorded from 46.20m to 47.50m bgl and a thin seam from 48.0m to 48.30m bgl. Borehole reinstated with bentonite to 15.0m bgl. Borehole reinstated with ground gas/water monitoring well within Made Ground to 1.20m bgl.

Borehole Log

Borehole No.

BH03

Sheet 1 of 1

Project Name: Station Works

Project No.
2300

Co-ords: -

Hole Type
BH

Location: Bury Road, Radcliffe

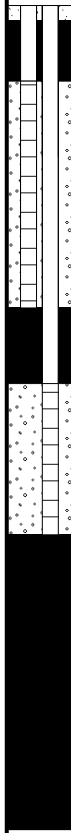
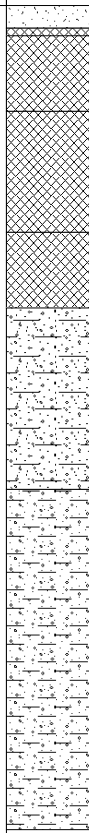
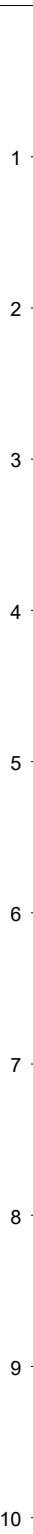
Level: 69.50

Scale
1:50

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 26/07/2023

Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.15			0.15	69.35		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
		0.20			0.20	69.30		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
		0.70			0.70	68.80		MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		1.00	ES		1.00			MADE GROUND: Red-brown, sandy gravel with low cobble content. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone.	
		1.20		N=13 (2,2/2,3,4,4)	1.20			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		1.50			1.50	68.00		MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		1.90	ES		1.90			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone.	
		2.00		N=20 (5,5/5,5,5,5)	2.00	67.50		MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		2.00 - 2.45	D		2.00 - 2.45			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		3.00		N=19 (8,8/5,4,5,5)	3.00			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		3.00 - 3.45	D		3.00 - 3.45			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		4.00		N=24 (5,6/5,6,6,7)	4.00			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		4.00 - 4.45	D		4.00 - 4.45			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		5.00		N=24 (5,5/6,6,6,6)	5.00			MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
					5.45	64.05		End of borehole at 5.45 m	

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 5.45m bgl. Groundwater encountered at 2.00m bgl. Borehole reinstated with dual ground gas/water monitoring well; within Made Ground to 2.0m bgl and within natural gravel to 3.50m bgl.

Borehole Log

Borehole No.

BH04

Sheet 1 of 1

Project Name: Station Works

Project No.
2300

Co-ords: -

Hole Type
BH

Location: Bury Road, Radcliffe

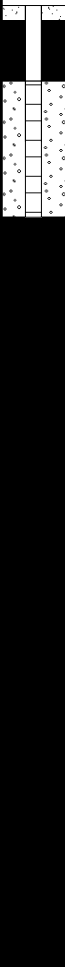
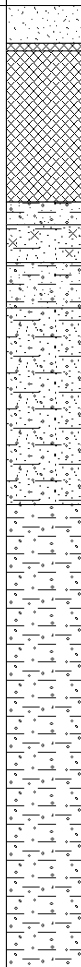
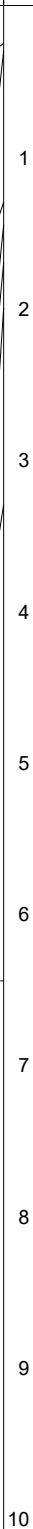
Level: 69.53

Scale
1:50

Client: Paul Cook Developments (Whitehaven) Ltd

Dates: 19/07/2023 - 25/07/2023

Logged By
TW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.25			0.25	69.28		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
		0.30			0.30	69.23		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
		1.20			1.30	68.23		MADE GROUND: Light grey-black, sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
		1.30 - 1.40	D	N=4 (1,1/1,1,1,1)	1.45	68.08		Very soft, orangish brown, slightly sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
		1.80	ES		1.70	67.83		Very loose, orange-brown clayey silty SAND. Sand is fine.	
		2.00	B	7 (2,3/7 for 150mm)	2.00	67.53		Soft to firm, orangish brown, very sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
		2.00 - 2.45						Medium dense, grey-brown, clayey gravelly SAND. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
		2.50						Becoming very gravelly from 21.90m to 3.30m bgl.	
		2.50 - 2.95	D	N=12 (4,4/3,3,3,3)				Hard, dark brown, gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
		3.00			3.30	66.23			
		3.40 - 3.50	D						
		4.00		N=34 (5,7/7,8,10,9)					
		5.00		N=22 (3,4/4,5,6,7)					
		6.00		N=47 (7,8/10,10,12,15)					
					6.45	63.08		End of borehole at 6.45 m	

Remarks

Location checked for underground services using CAT4 scanner. Borehole drilled using cable percussive rig to 6.45m bgl. Groundwater encountered at 1.00m and at 2.00m bgl. Borehole reinstated with ground gas/water monitoring well within Made Ground to 1.40m bgl

Trial Pit Log

TrialPit No
TP01
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.59
Date 18/07/2023

Location: Bury Road, Radcliffe
Dimensions (m): 1.50
Scale 1:25

Client: Paul Cook Developments (Whitehaven) Ltd
Depth 2.80
Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.20	69.39		MADE GROUND: Concrete.	
				0.30	69.29		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE). <i>Metal bar recorded in ground at 0.20m to 0.25m bgl.</i>	
	0.70	ES		0.80	68.79		MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	1
				1.30	68.29		MADE GROUND: Orangish brown, very sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, quartzite, sandstone and mudstone.	
	1.50 - 1.60	D		1.80	67.79		Soft, orangish brown, slightly sandy slightly gravelly CLAY with rootlets. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
							Brown-grey locally red-brown, slightly silty sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
	2.40 - 2.50	B					<i>Becoming silty and less sandy from 2.30m to 2.80m bgl.</i>	
				2.80	66.79		End of Pit at 2.800m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 2.80m bgl and aborted due to side wall collapse. Groundwater encountered 2.20m bgl. Excavation backfilled with arisings on completion.

Stability: Unstable from 2.60 to 2.80m bgl.



Trial Pit Log

TrialPit No
TP02
Sheet 1 of 1

Project Name: Station Works

Project No.
2300

Co-ords: -
Level: 69.59

Date
18/07/2023

Location: Bury Road, Radcliffe

Dimensions (m): 1.50

Depth
3.00

0.70

Scale
1:25

Logged
TW

Client: Paul Cook Developments (Whitehaven) Ltd

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.15	69.44		MADE GROUND: Concrete.	
				0.20	69.39		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
							MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
				0.70	68.89		MADE GROUND: Dark grey-black, slightly sandy slightly gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, coal, quartzite, sandstone and mudstone.	1
	1.20	ES						
				1.40	68.19		Soft, orangish brown, slightly silty sandy CLAY with rootlets. Sand is fine.	
	2.00 - 2.10	D						2
				2.20	67.39		Soft to firm, grey, silty slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of coal, quartzite, sandstone, coal and mudstone.	
				2.60	66.99		Gravel bands present within clay from 2.50m to 2.60m bgl.	
	2.70	ES					Grey-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
							Cobbles of sandstone, quartzite and mudstone from 2.80m to 3.0m bgl.	
				3.00	66.59		End of Pit at 3.000m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.0m bgl and aborted due to side wall collapse. Groundwater encountered 2.70m bgl - slight hydrocarbon sheen and odour noted in groundwater. Excavation backfilled with arisings on completion.

Stability: Unstable from 2.50 to 3.00m bgl.

				Trial Pit Log			TrialPit No TP03 Sheet 1 of 1			
Project Name: Station Works				Project No. 2300		Co-ords: - Level: 69.50		Date 18/07/2023		
Location: Bury Road, Radcliffe						Dimensions (m): 0.70 1.50		Scale 1:25		
Client: Paul Cook Developments (Whitehaven) Ltd						Depth 3.00		Logged TW		
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
	Depth	Type	Results							
	1.20	ES		0.30	69.20		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).			1
			0.40	69.10	MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).					
			0.60	68.90	MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.					
			1.00	68.50	MADE GROUND: Orangish brown, very sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, quartzite, sandstone and mudstone. (Slight sulphurous odour)					
			1.60	67.90	MADE GROUND: Orangish brown-black, sandy very gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, ash, cinder, coal, quartzite, sandstone and mudstone. <i>Pockets of sand within clay from 1.20m to 1.50m bgl.</i>					
			2.00	67.50	Soft, orangish brown, slightly silty sandy CLAY. Sand is fine.					
			2.60	66.90	Soft to firm, grey, silty slightly sandy CLAY. Sand is fine. <i>Gravel bands present within clay from 2.50m to 2.60m bgl.</i>					
			3.00	66.50	Grey-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.					
						End of Pit at 3.000m			3	
									4	
									5	

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.00m bgl and aborted due to side wall collapse. Groundwater encountered 2.70m bgl. Excavation backfilled with arisings on completion.
 Stability: Unstable from 2.50 to 3.00m bgl.



Trial Pit Log

Trial Pit No
TP04
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.78
Date 18/07/2023

Location: Bury Road, Radcliffe
Client: Paul Cook Developments (Whitehaven) Ltd
Dimensions (m): 1.50
Depth 1.40
Scale 1:25
Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.25 0.30	69.53 69.48		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
							MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
							Blue membrane underlying concrete at 0.25m bgl.	
				0.60	69.18		MADE GROUND: Red brown-black, clayey gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, mudstone and sandstone.	
	1.00	ES					MADE GROUND: Dark brown, sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, quartzite, sandstone and mudstone.	1
	1.20	ES					Blue plastic piping encountered at 1.0m bgl.	
				1.30 1.40	68.48 68.38		MADE GROUND: Soft, orangish brown, silty sandy clay. Sand is fine to medium.	
							Old clay pipe filled with water with hydrocarbon odour encountered at 1.30m bgl.	
							End of Pit at 1.400m	
								2
								3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 1.40m bgl and aborted due to clay pipe encountered, some water flowed into pit from pipe with hydrocarbon odour but ceased. Clay pipe encountered at 1.30m bgl running west-east. Groundwater not encountered. Excavation backfilled with arisings on completion.

Stability: Stable

				Trial Pit Log				TrialPit No TP04A Sheet 1 of 1		
Project Name: Station Works				Project No. 2300		Co-ords: - Level: 69.78		Date 18/07/2023		
Location: Bury Road, Radcliffe						Dimensions (m): 0.70 1.50		Scale 1:25		
Client: Paul Cook Developments (Whitehaven) Ltd						Depth 3.00		Logged TW		
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description			
	Depth	Type	Results							
	0.40	ES		0.25	69.53		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick). <i>Concrete to north of pit extends to 0.50m bgl.</i>			
				0.30	69.48					
				0.60	69.18		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE). MADE GROUND: Red-brown, sandy gravel with low cobble content. Sand is fine to medium. Gravel is fine to coarse, subangular brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone. MADE GROUND: Orange-brown and black, slightly silty slightly sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular brick, ash, charcoal, cinder, coal, mudstone and sandstone.			
				1.20	68.58					
	1.70 - 1.80	D		1.60	68.18		Soft to firm, orangish brown, slightly sandy slightly gravelly CLAY with rootlets. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. Light brown, silty slightly gravelly, fine to medium SAND. Gravel is fine to coarse, subangular to subrounded of sandstone, coal, mudstone and quartzite. <i>Becoming gravelly from 2.0m to 2.30m bgl.</i>			
				2.30	67.48					
				3.00	66.78		Orange-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. End of Pit at 3.000m			
								1 2 3 4 5		
	Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.00m bgl and aborted due to side wall collapse. Groundwater encountered 2.70m bgl. Excavation backfilled with arisings on completion.									
Stability: Unstable from 2.70 to 3.00m bgl										
										

Trial Pit Log

TrialPit No
TP05
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.54
Date 18/07/2023

Location: Bury Road, Radcliffe
Dimensions (m): 1.50
Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd
Depth 2.70
Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
				0.25	69.29		MADE GROUND: Concrete.	
				0.30	69.24		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE). MADE GROUND: Brick and concrete cobbles.	
	0.80	ES		0.60	68.94		MADE GROUND: Red-brown, sandy gravel with low cobble content. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone.	
				1.00	68.54		MADE GROUND: Orange-brown, silty gravelly clay. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, coal, mudstone and sandstone.	1
	1.30 - 1.40	D		1.20	68.34		Soft, orangish brown, slightly silty sandy CLAY. Sand is fine. <i>Becoming gravelly from 1.50m to 1.70m bgl.</i>	
	1.80 - 1.90	B		1.70	67.84		Orange-brown and grey, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
				2.50	67.04		Grey-brown, slightly sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				2.70	66.84		End of Pit at 2.700m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 2.70m bgl and aborted due to side wall collapse. Groundwater encountered 2.50m bgl. Excavation backfilled with arisings on completion.
Stability: Unstable from 2.65m to 2.70m bgl.

Trial Pit Log

Trial Pit No
TP06
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.87
Date 19/07/2023

Location: Bury Road, Radcliffe
Dimensions (m): 1.50
Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd
Depth 2.90
Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	ES		0.20 0.25	69.67 69.62		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
							MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
							MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. (Slight hydrocarbon odour)	
				0.70	69.17		MADE GROUND: Orange-brown and black, slightly silty slightly sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, ash, charcoal, cinder, coal, mudstone and sandstone.	1
				1.20	68.67		Soft to firm, orangish brown, slightly silty sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
	1.60 - 1.70	B		1.80	68.07		Yellow-brown, clayey slightly sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
				2.20	67.67		Yellow-brown, very coarse slightly sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
							Band of silty gravelly clay from 2.50m to 2.60m bgl.	
				2.90	66.97		End of Pit at 2.900m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 2.90m bgl and aborted due to side wall collapse. Groundwater encountered 2.60m bgl. Excavation backfilled with arisings on completion.
Stability: Unstable from 2.70 to 2.90m bgl.

Trial Pit Log

TrialPit No
TP07
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.60
Date 19/07/2023

Location: Bury Road, Radcliffe
Dimensions (m): 1.50
Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd
Depth 3.00
Logged TW

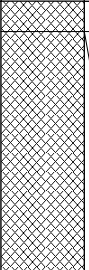
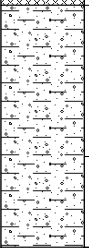
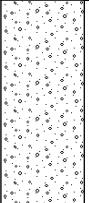
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70	ES		0.15	69.45		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
				0.20	69.40		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE).	
				0.50	69.10		MADE GROUND: Black, slightly sandy gravel. Sand is fine to coarse. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone.	
				0.90	68.70		MADE GROUND: Black very clayey slightly gravelly sand. Gravel is fine to coarse, subangular of brick, ash, charcoal, cinder, coal, mudstone and sandstone.	
				1.20	68.40		MADE GROUND: Orangish brown, very sandy gravelly clay. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, quartzite, sandstone and mudstone.	
				1.80	67.80		Firm, orange-brown and yellow, slightly sandy slightly gravelly CLAY. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone and mudstone.	
				2.00	67.60		Soft to firm, grey-brown, silty slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone and mudstone.	
							Orange-brown, clayey sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				3.00	66.60		End of Pit at 3.000m	

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.00m bgl and aborted due to side wall collapse. Groundwater encountered 2.50m bgl. Excavation backfilled with arisings on completion.
Stability: Unstable from 2.70 to 2.90m bgl.

Trial Pit Log

TrialPit No
TP08
Sheet 1 of 1

Project Name: Station Works	Project No. 2300	Co-ords: - Level: 70.15	Date 19/07/2023
Location: Bury Road, Radcliffe	Dimensions (m): 0.70 1.50 Depth 3.10		Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd			Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
	1.00	ES		0.10	70.05		MADE GROUND: Dark brown, very gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, coal, mudstone and sandstone. Occasional cobbles of brick and concrete. MADE GROUND: Brick and concrete cobbles. <i>Brick wall encountered at west edge of pit to 1.0m bgl.</i>	1
				0.90	69.25		MADE GROUND: Orange-brown, clayey gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, ash, charcoal, coal, mudstone and sandstone.	
				1.20	68.95		Soft to firm, orangish brown, sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. <i>Becoming very sandy and very gravelly from 1.70m to 2.00m bgl.</i>	
				2.00	68.15		Orange-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
				2.70	67.45		Grey-brown, silty slightly sandy GRAVEL. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	3
				3.00	67.15		Stiff, dark grey, gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				3.10	67.05		End of Pit at 3.100m	
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.10m bgl and aborted due to side wall collapse. Brick wall encountered to 1.0m bgl at west of pit. Groundwater encountered 2.30m bgl. Excavation backfilled with arisings on completion.

Stability: Unstable from 2.70 to 2.90m bgl.

Trial Pit Log

TrialPit No
TP09
Sheet 1 of 1

Project Name: Station Works

Project No.
2300

Co-ords: -
Level: 69.51

Date
19/07/2023

Location: Bury Road, Radcliffe

Dimensions (m): 1.50

Scale
1:25

Client: Paul Cook Developments (Whitehaven) Ltd

Depth
2.70

0.70

Logged
TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40	ES		0.20	69.31		MADE GROUND: Reinforced concrete with thin two-way rebar (2mm thick).	
				0.30	69.21		MADE GROUND: Whitish brown, sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of limestone and quartzite (SUBBASE). <i>Concrete foundation encountered to north of pit from 0.20m to 1.40m bgl extending 1.0m from centre of steel stantion.</i>	
							MADE GROUND: Brown, very gravelly sand with low cobble content. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, metal, mudstone and sandstone. Cobbles of brick and sandstone.	
				1.00	68.51		MADE GROUND: Orange-brown, very sandy gravelly clay. Sand is fine. Gravel is fine to coarse, subangular to subrounded of brick, ash, quartzite, sandstone, coal and mudstone.	1
				1.20	68.31		Soft to firm, orangish brown, slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				1.40	68.11		Brown-grey locally red-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				2.00	67.51		Brown-grey slightly sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
				2.70	66.81		End of Pit at 2.700m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 2.70m bgl and aborted due to side wall collapse. Steel stantion excavated around and exposed concrete pad to 1.40m bgl extedning 1.0m from steel stantion. Groundwater encountered 2.40m bgl. Excavation backfilled with arisings on completion.

Stability: Unstable from 2.50m to 2.70m bgl.

Trial Pit Log

Trial Pit No
TP10
Sheet 1 of 1

Project Name: Station Works
Project No. 2300
Co-ords: -
Level: 69.75
Date 19/07/2023

Location: Bury Road, Radcliffe
Dimensions (m): 1.50
Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd
Depth 2.70
Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
▼	0.50	ES		0.10	69.65		MADE GROUND: Asphalt.	
							MADE GROUND: Brick and concrete cobbles.	
				0.30	69.45		MADE GROUND: Dark brown, slightly clayey sandy gravel. Sand is fine to medium. Gravel is fine to coarse, subangular of brick, concrete, ash, charcoal, cinder, coal, mudstone and sandstone.	1
				0.80	68.95		MADE GROUND: Orange-brown, very sandy gravelly clay. Sand is fine. Gravel is fine to coarse, subangular to subrounded of brick, ash, quartzite, sandstone, coal and mudstone.	
				1.20	68.55		Orange-brown, clayey gravelly SAND. Sand is fine to medium. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				1.70	68.05		Orange-brown, sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
				2.00	67.75		Grey-brown, slightly silty sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				2.70	67.05		End of Pit at 2.700m	3
								4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 2.70m bgl and aborted due to side wall collapse. Groundwater encountered 2.20m bgl. Excavation backfilled with arisings on completion.
Stability: Unstable from 2.0m to 2.80m bgl.

Trial Pit Log

Trial Pit No
TP11
Sheet 1 of 1

Project Name: Station Works Project No. 2300 Co-ords: -
Level: 70.15 Date 19/07/2023

Location: Bury Road, Radcliffe Dimensions (m): 1.50
0.70
Depth 3.70 Scale 1:25
Client: Paul Cook Developments (Whitehaven) Ltd Logged TW

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10			0.10	70.05		MADE GROUND: Asphalt.	
							MADE GROUND: Black-brown, clayey very gravelly sand. Sand is fine to medium. Gravel is fine to coarse, subangular to subrounded of brick, concrete, ash, cinder, sandstone, coal, mudstone and quartzite. (Slight sulphurous odour) <i>Brick wall encountered at north edge of pit to 0.70m bgl.</i>	
	0.90	ES					<i>Concrete strip footing supporting brick wall from 0.70m to 0.90m bgl.</i>	
				1.00	69.15		Orange-brown, very clayey gravelly SAND. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	1
				1.70	68.45		Soft to firm, orangish brown, slightly silty slightly gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	2
	2.00 - 2.10	D		2.20	67.95		Firm, grey, very silty slightly sandy CLAY. Sand is fine.	
				2.60	67.55		Grey-brown, slightly silty slightly clayey slightly sandy GRAVEL. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone. <i>Bands of grey silty clay from 2.90 to 3.20m bgl.</i>	3
				3.20	66.95		Stiff, grey, slightly sandy gravelly CLAY. Sand is fine. Gravel is fine to coarse, subangular to subrounded of quartzite, sandstone, coal and mudstone.	
				3.70	66.45		End of Pit at 3.700m	4
								5

Remarks: Location checked for underground services using CAT4 scanner. Machine excavated trial pit progressed to 3.70m bgl and aborted due to side wall collapse. Brick wall encountered across pit to 0.70m bgl with underlying strip foundation to 0.90m bgl. Groundwater not encountered. Excavation backfilled with arisings on completion.
Stability: Unstable from 3.50m to 3.70m bgl.

Appendix 4 – Site Photographs



Station Works: 18/07/23 Site Photo North



Station Works: 18/07/23 Site Photo East



Station Works: 18/07/23 Site Photo Spoil Heap



Station Works: 18/07/23 East Boundary



Station Works: 18/07/23 Access to River



Station Works: 18/07/23 Concrete Plinth (NE)



Station Works: 18/07/23 Veg Clearance (NW)



Station Works: 18/07/23 Site Photo South



Station Works: 18/07/23 Site South Boundary



Station Works: 18/07/23 TP01 Made Ground



Station Works: 18/07/23 TP01 Complete



Station Works: 18/07/23 TP02 Side View



Station Works: 18/07/23 TP02 Oily Sheen



Station Works: 18/07/23 TP03 Side View



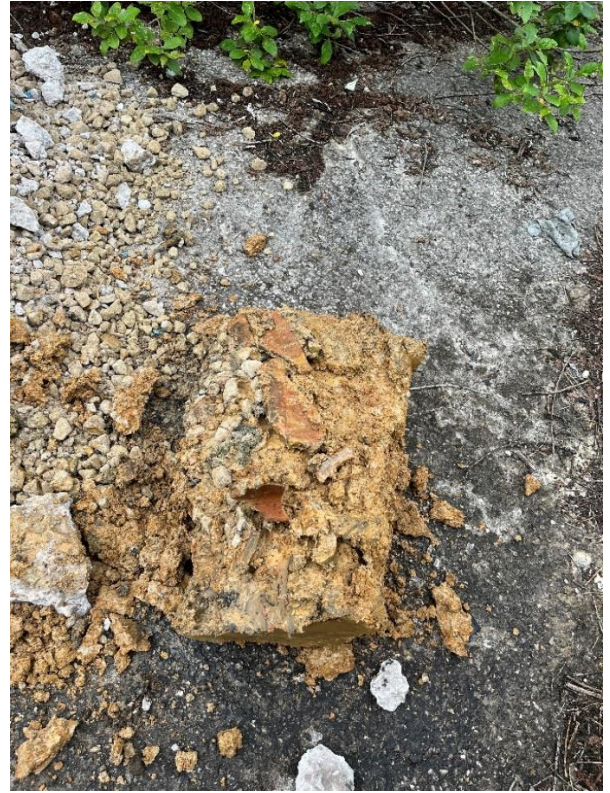
Station Works: 18/07/23 TP03 Arisings



Station Works: 18/07/23 Soft Clay at 2.0m bgl



Station Works: 18/07/23 TP04 Complete



Station Works: 18/07/23 TP04 Clay Pipe at 1.30m



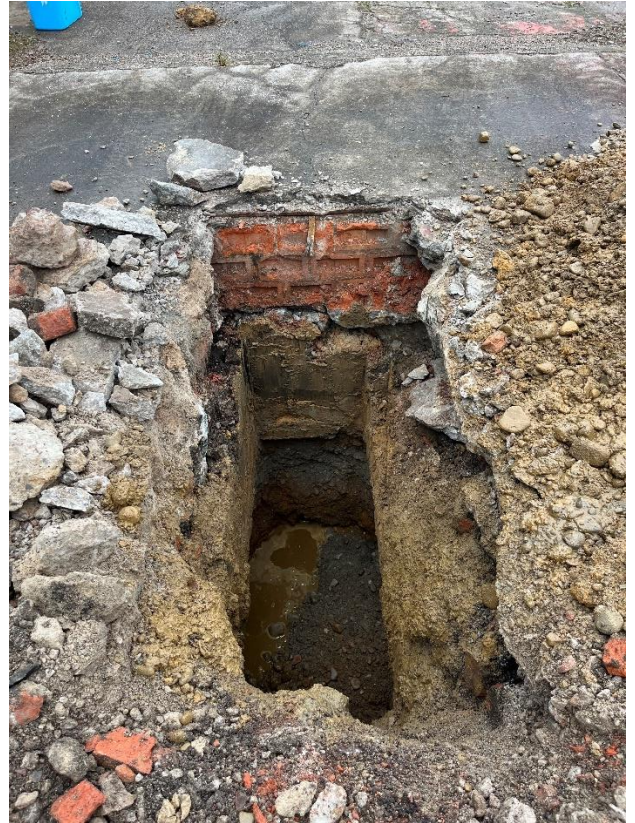
Station Works: 18/07/23 TP04A Complete



Fort Vale: 27/03/23 TP04A Natural Gravel



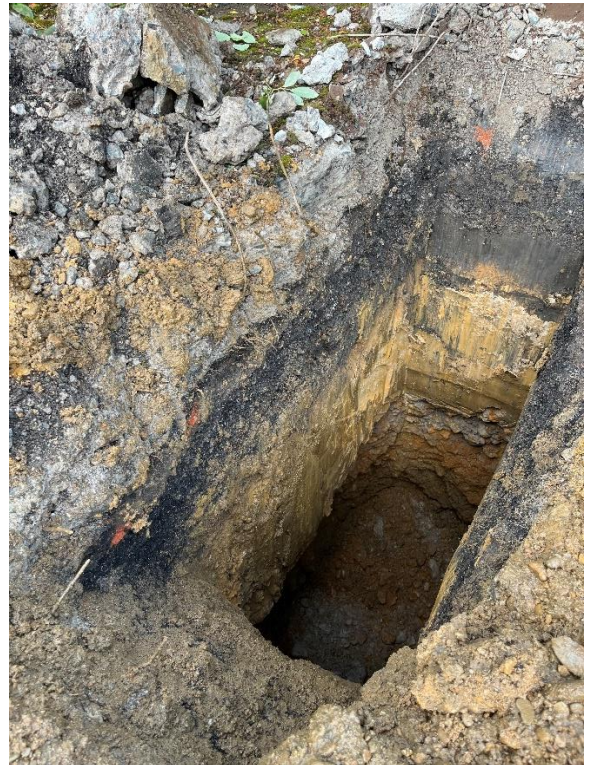
Station Works: 18/07/23 TP05 Complete



Station Works: 18/07/23 TP05 Brick Wall



Station Works: 19/07/23 TP06 Side View



Station Works: 19/07/23 TP07 Side View



Station Works: 19/07/23 TP08 Buried Brick Wall



Station Works: 19/07/23 TP08 Complete



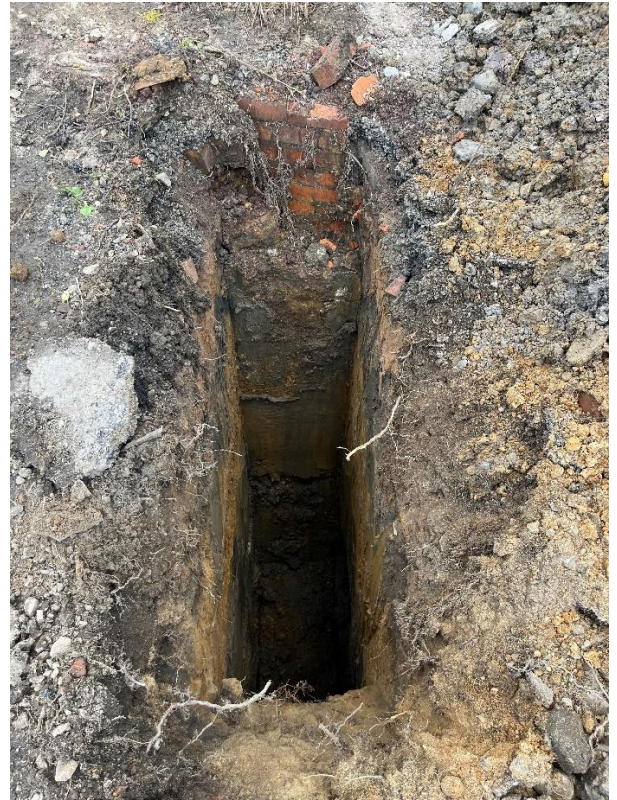
Station Works: 19/07/23 TP09 Pad Footing



Station Works: 19/07/23 TP10 Complete



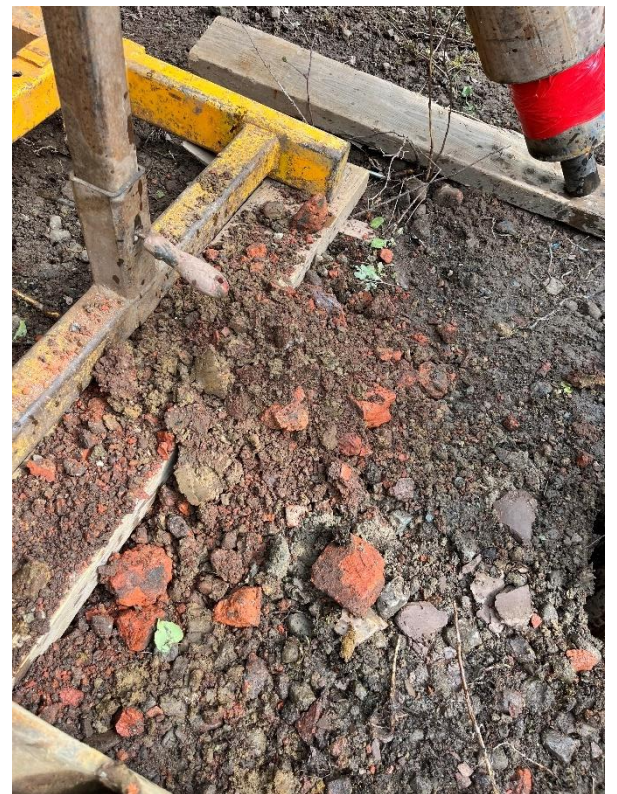
Station Works: 19/07/23 TP10 Arisings



Station Works: 19/07/23 TP11 Brick Wall/Footing



Station Works: 19/07/23 BH01 Location



Station Works: 19/07/23 BH01 Brick Fill



Station Works: 19/07/23 BH01 Natural Sand 1.20m



Station Works: 20/07/23 BH01 Stiff Clay 4.0m



Station Works: 20/07/23 BH01A Gravel 4.0m



Station Works: 20/07/23 BH01A Hard Clay 10.50m



Station Works: 21/07/23 BH01A Rotary Water Flush



Station Works: 21/07/23 BH01A Rotary Water Flush Coal at 47.0m



Station Works: 21/07/23 BH01A Coal Returns



Station Works: 23/07/23 BH02 Location



Station Works: 23/07/23 BH02 Made Ground



Station Works: 23/07/23 BH02 Stiff Clay 3.0m



**Station Works: 23/07/23 BH02 Granit Boulder
12.50m**



**Station Works: 26/07/23 BH02 Rotary Water Flush
Coal at 46.5m**



Station Works: 25/07/23 BH03 Made Ground



Station Works: 25/07/23 BH03 Natural Gravel 2.0m



Station Works: 26/07/23 BH03 Stiff Clay 3.20m



Station Works: 25/07/23 BH04 Sand/Gravel 2.0m



Station Works: 26/07/23 BH01A Install



Station Works: 26/07/23 BH02 Install



Station Works: 26/07/23 BH03 Install



Station Works: 26/07/23 BH04 Install



Appendix 5 – Geotechnical Test Results



TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761978

Hole No.: TP01

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly clayey SAND

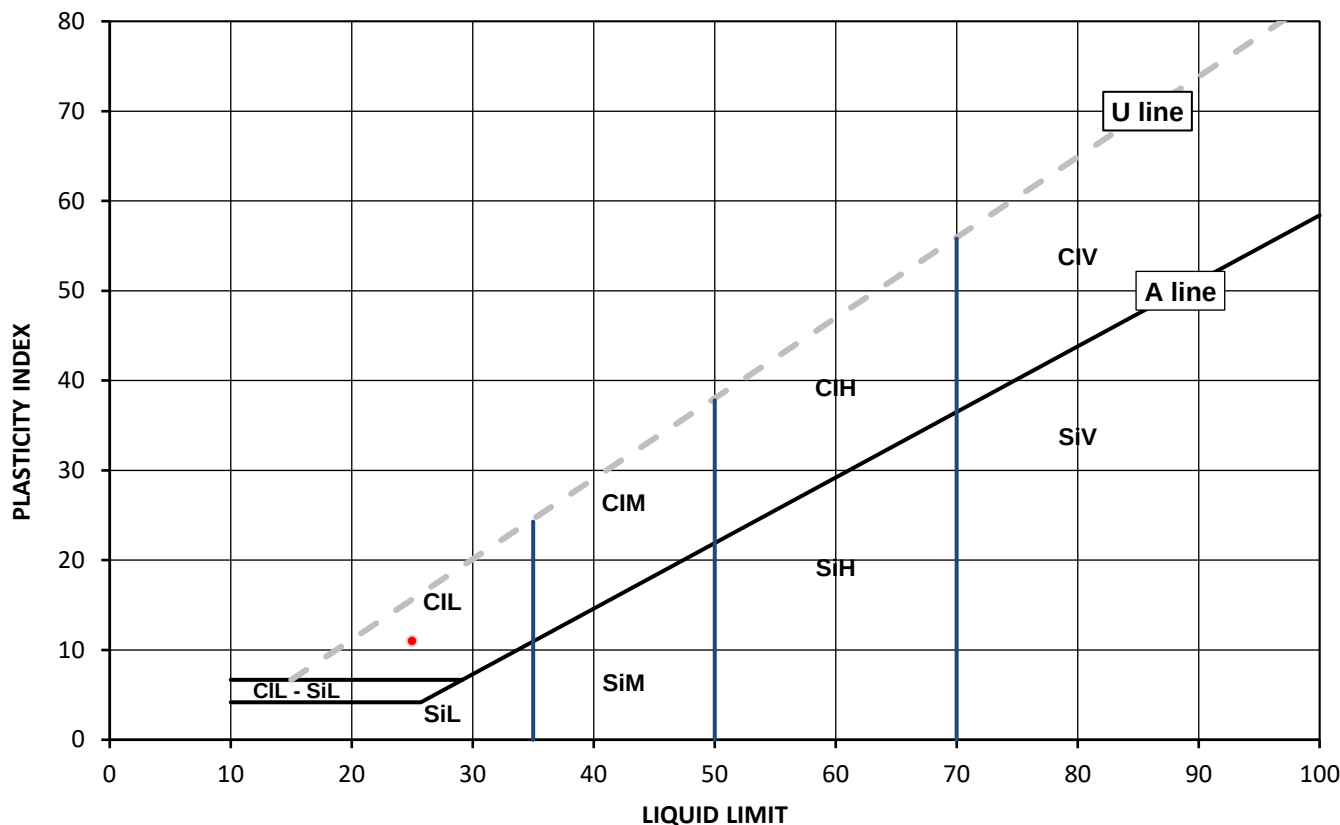
Depth Top [m]: 1.50

Depth Base [m]: 1.60

Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
15	25	14	11	94



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

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
		50 to 70
		exceeding 70
		append to classification for organic material (eg CIHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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i2 Analytical Ltd
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Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

4041

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Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761979

Hole No.: TP05

Sample Reference: Not Given

Sample Description: Brown slightly gravelly sandy slightly silty CLAY

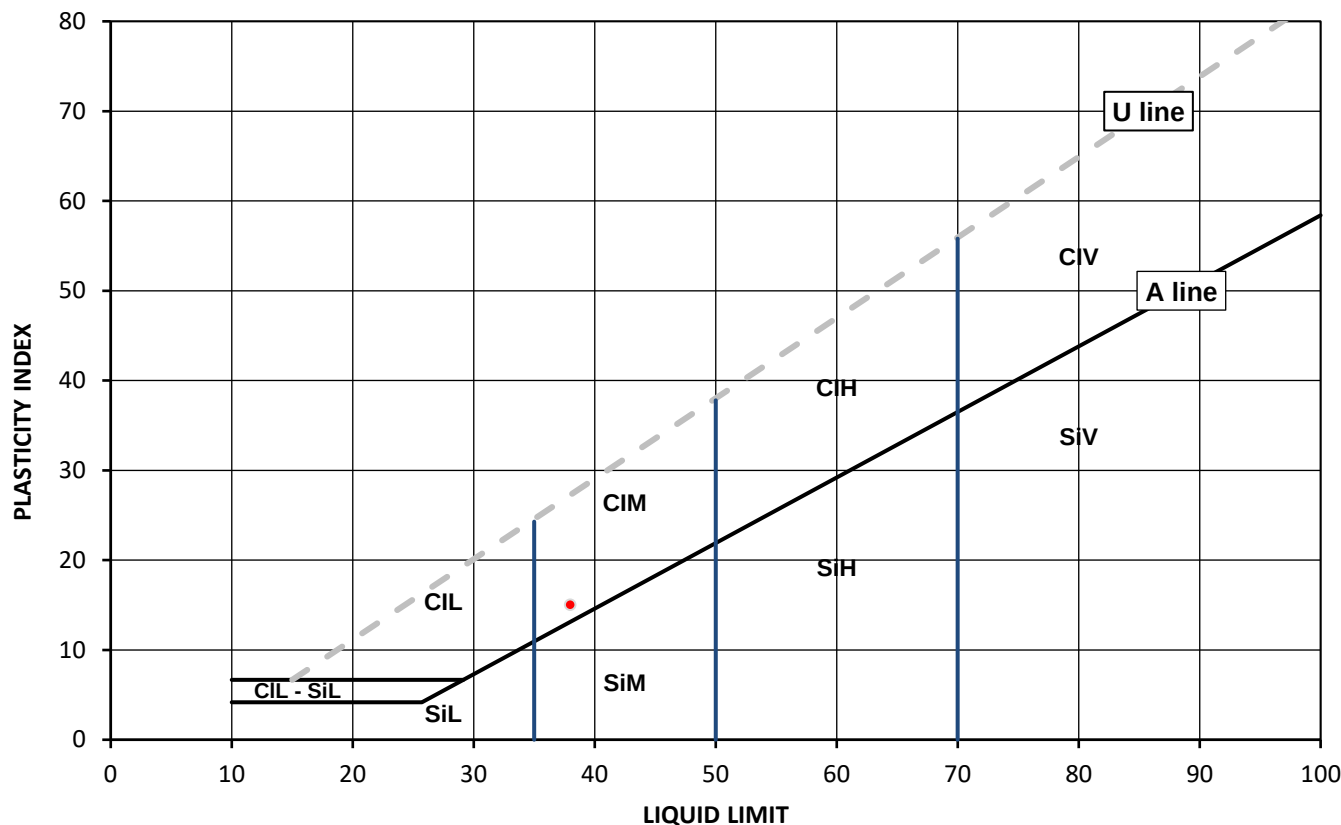
Depth Top [m]: 1.30

Depth Base [m]: 1.40

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	38	23	15	86



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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Environmental Science

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Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761980

Hole No.: TP11

Sample Reference: Not Given

Sample Description: Yellowish brown slightly gravelly slightly sandy silty CLAY

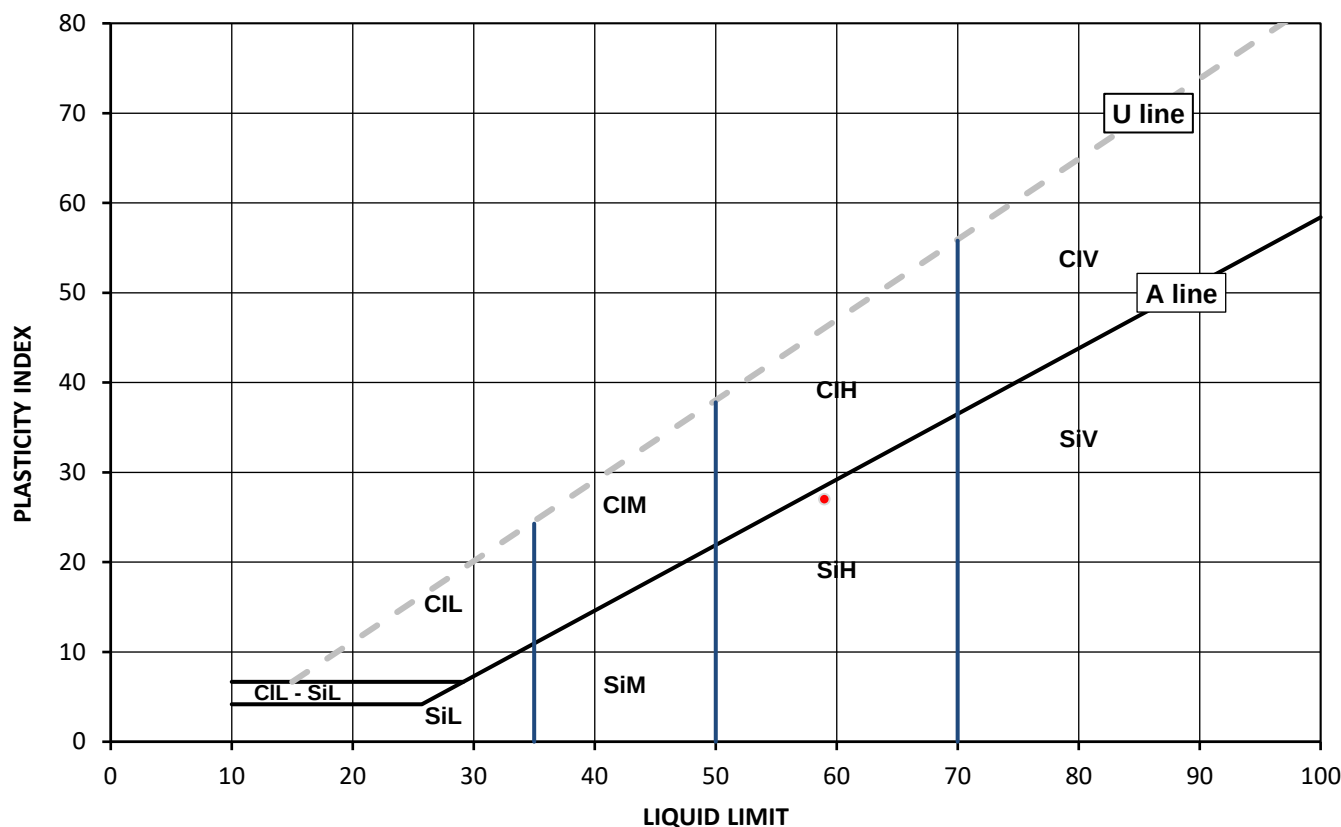
Depth Top [m]: 2.00

Depth Base [m]: 2.10

Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
38	59	32	27	98



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

i2 Analytical Ltd
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Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

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Client: Westlakes Consulting

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Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761981

Hole No.: BH01

Sample Reference: Not Given

Sample Description: Brownish grey gravelly sandy CLAY

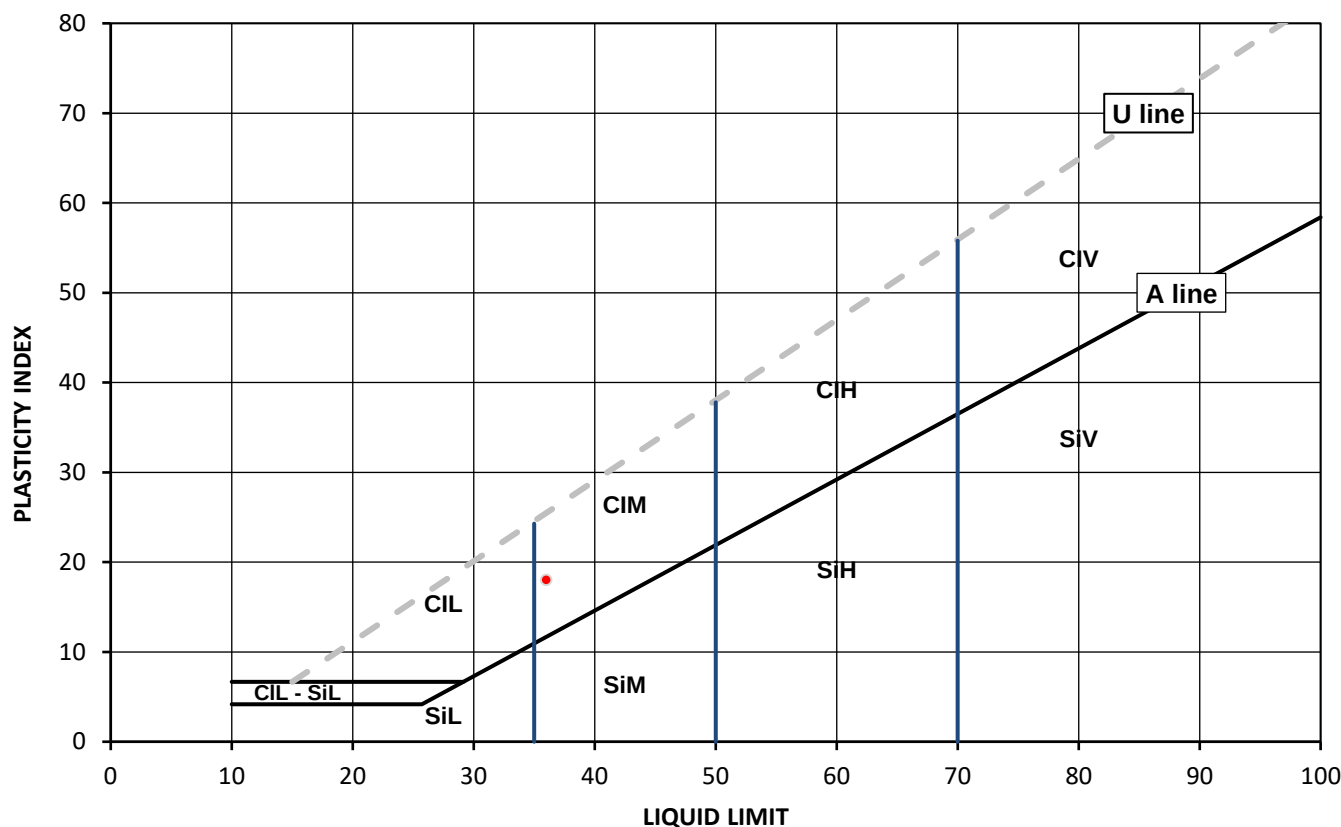
Depth Top [m]: 3.00

Depth Base [m]: 3.45

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	36	18	18	65



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

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Brackmills Industrial Estate
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Environmental Science

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Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 15/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761984

Hole No.: TP06

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly sandy silty CLAY

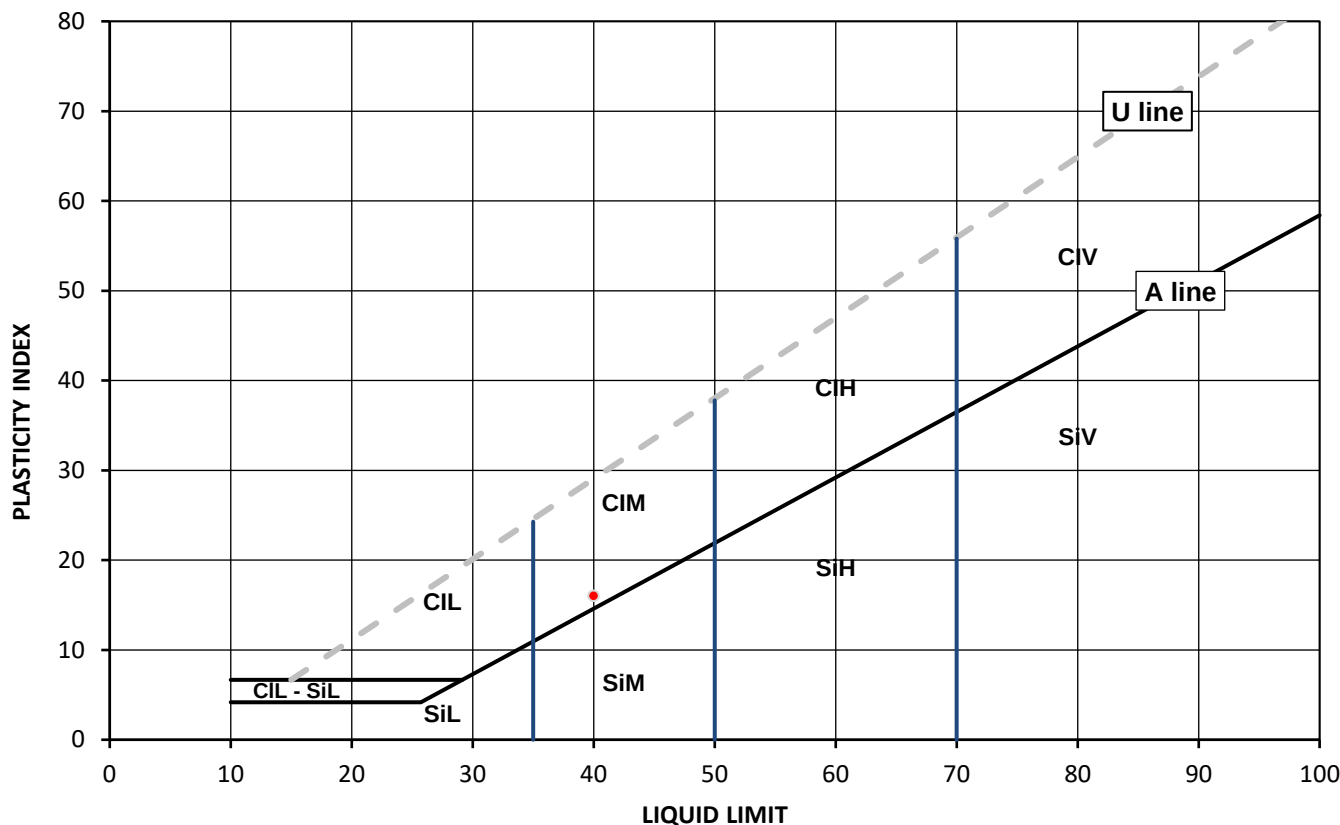
Depth Top [m]: 1.60

Depth Base [m]: 1.70

Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
26	40	24	16	93



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 09/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761985

Hole No.: BH02

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly slightly sandy CLAY

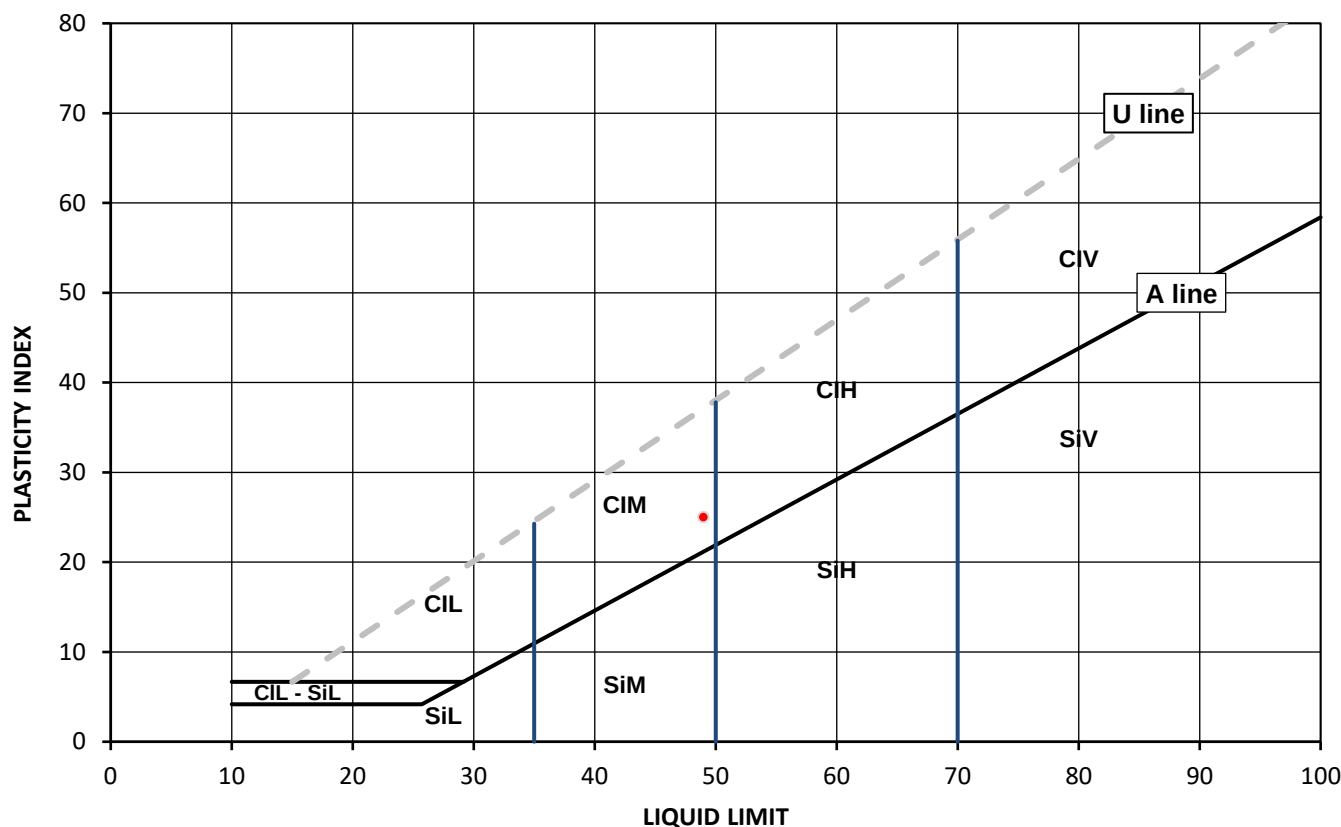
Depth Top [m]: 1.20

Depth Base [m]: 1.65

Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	49	24	25	99



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 09/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761987

Hole No.: BH04

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly slightly silty CLAY

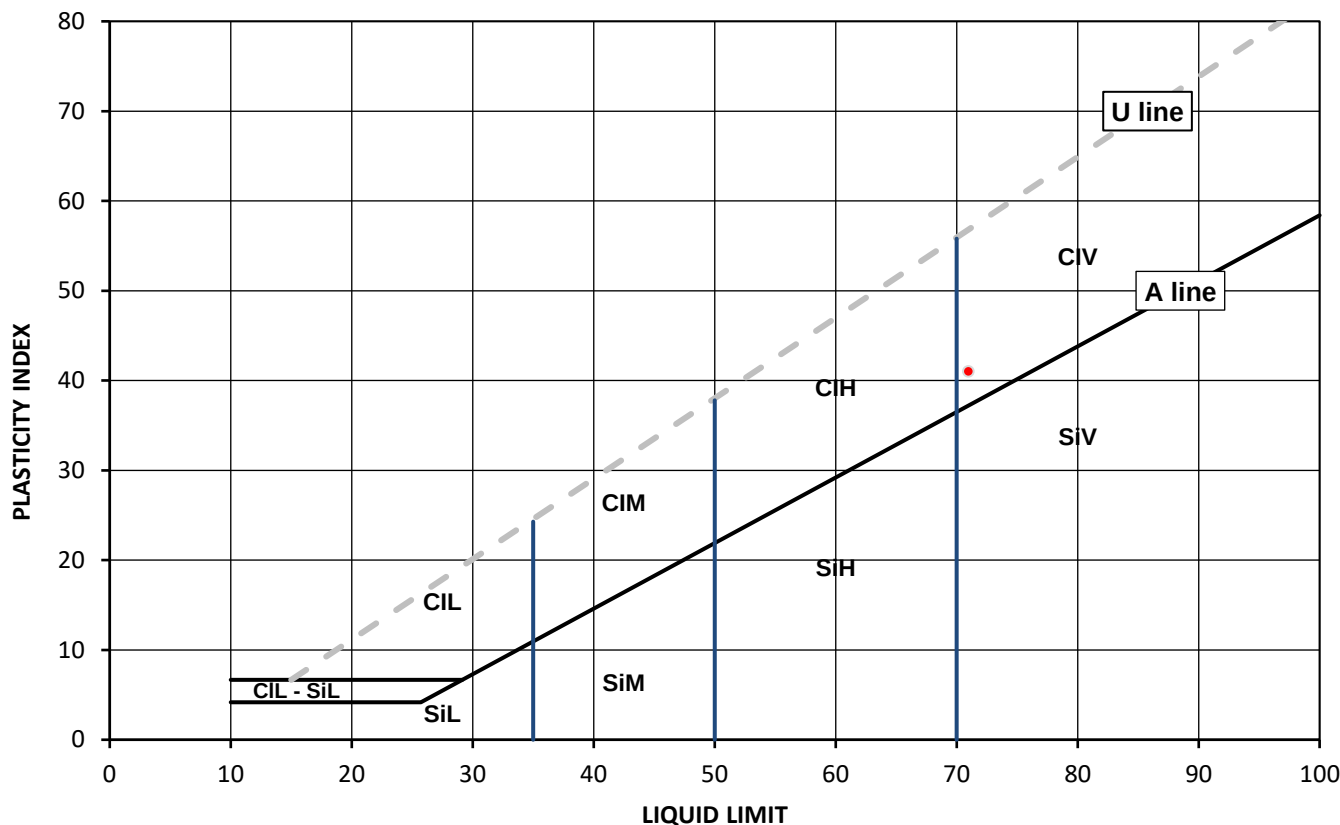
Depth Top [m]: 1.30

Depth Base [m]: 1.40

Sample Type: D

Sample Preparation: Tested after >425um removed by hand

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
52	71	30	41	97



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761988

Hole No.: BH04

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly very sandy CLAY

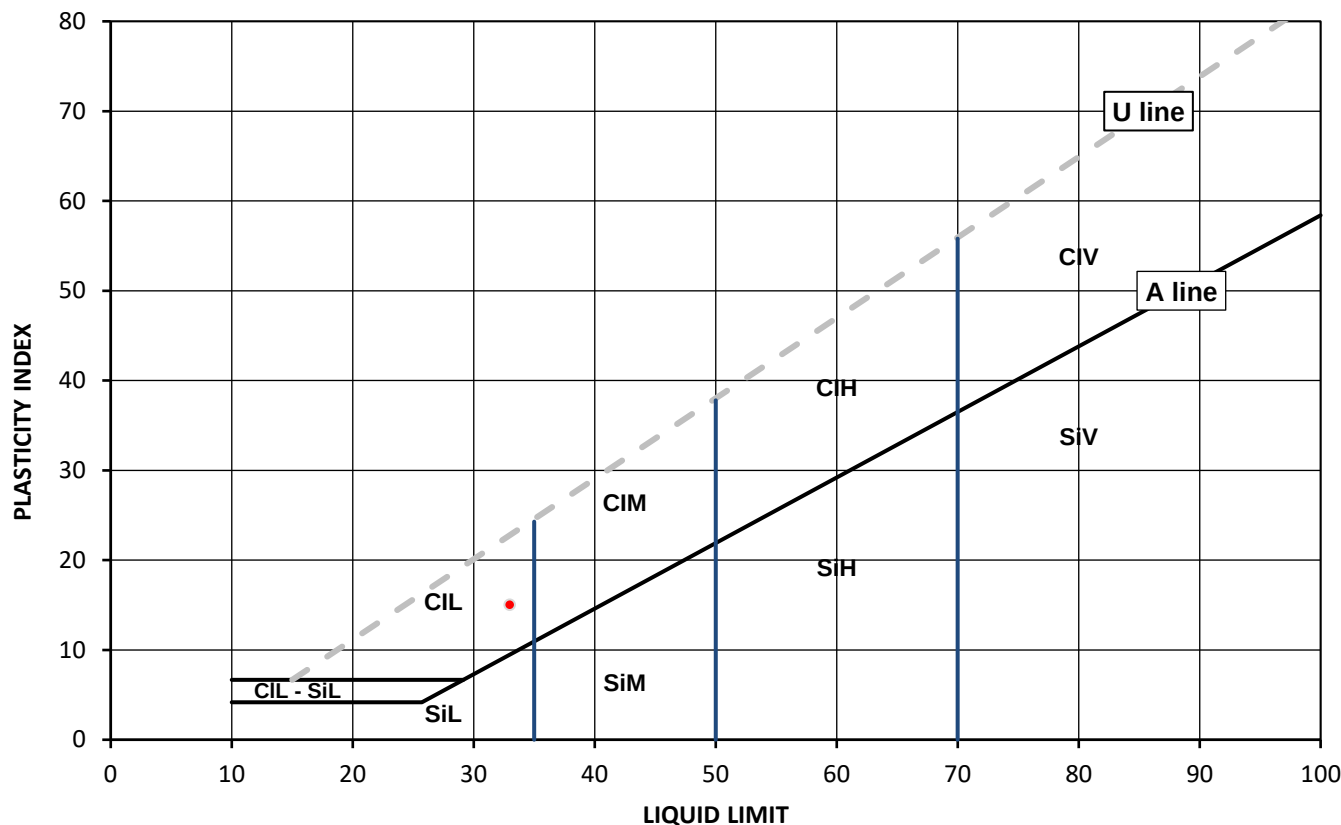
Depth Top [m]: 3.40

Depth Base [m]: 3.50

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
13	33	18	15	78



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 14/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761990

Hole No.: BH03

Sample Reference: Not Given

Sample Description: Brownish grey gravelly very sandy CLAY

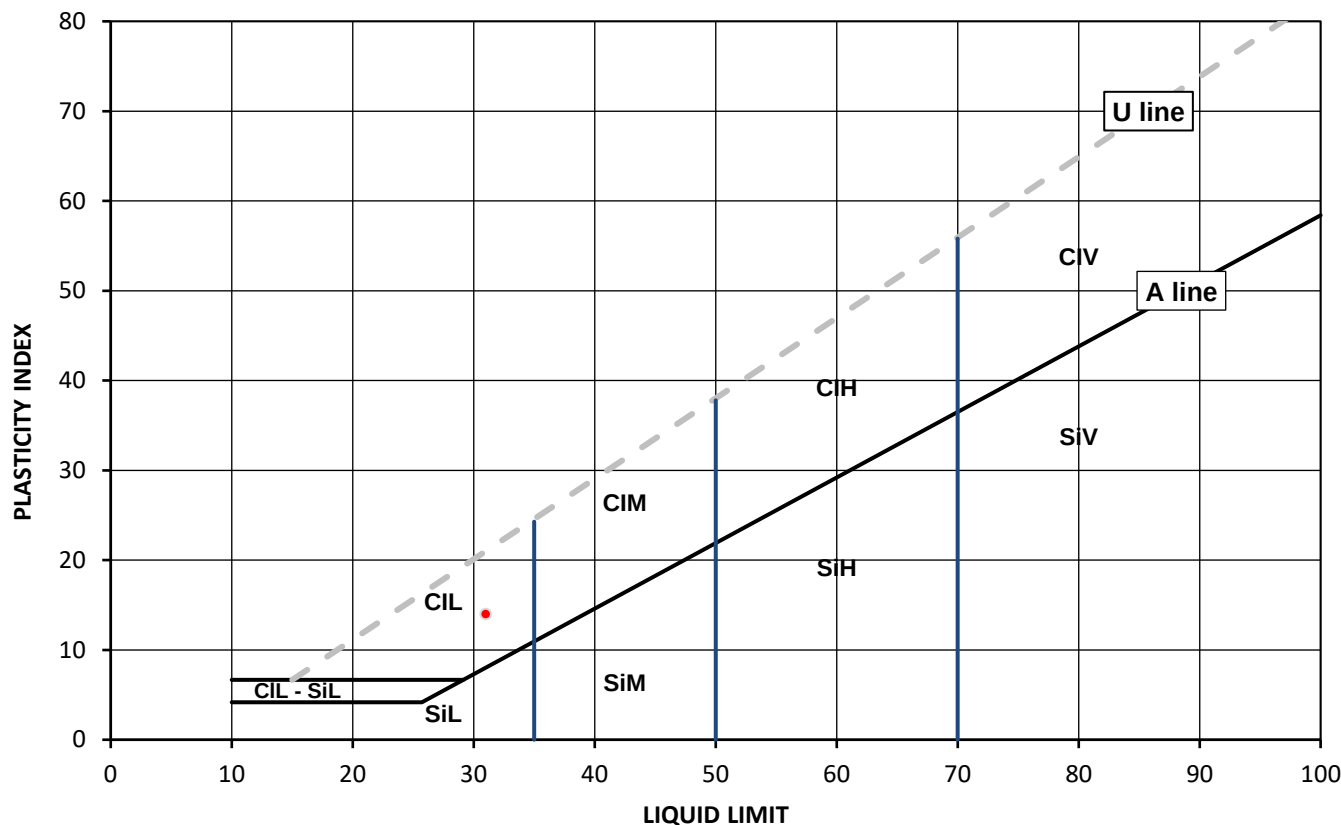
Depth Top [m]: 2.00

Depth Base [m]: 2.45

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
23	31	17	14	39



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS

Tested in Accordance with: BS 1377-2:1990: Clause 4.3 and 5

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 14/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761991

Hole No.: BH03

Sample Reference: Not Given

Sample Description: Brownish grey slightly gravelly very sandy CLAY

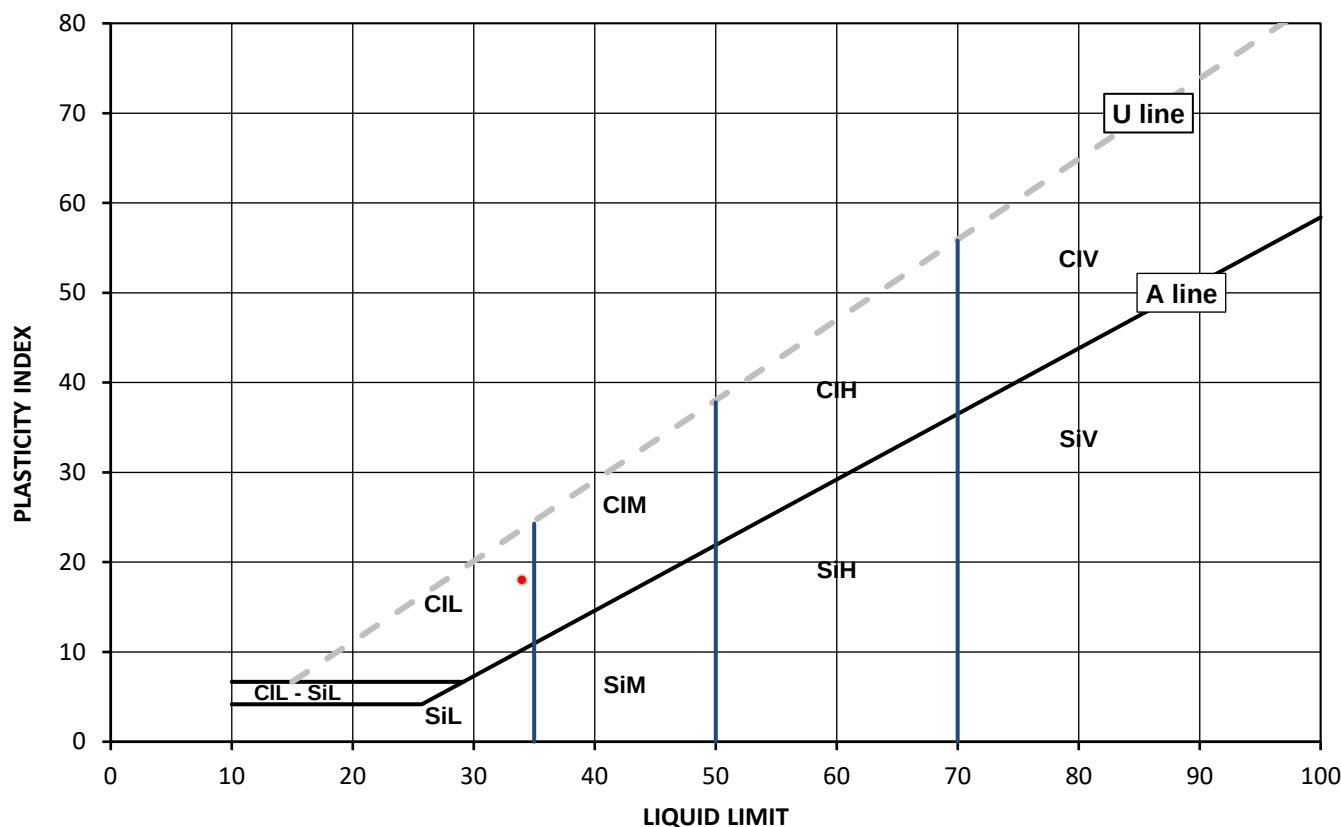
Depth Top [m]: 4.00

Depth Base [m]: 4.45

Sample Type: D

Sample Preparation: Tested after washing to remove >425um

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	34	16	18	69



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

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

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

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



Environmental Science

4041

Client: Westlakes Consulting
Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ
Contact: Tommy Walker
Site Address: Station Works, Bury Road Geotech Testing

Water Content by BS 1377-2:1990: Clause 3.2
Atterberg by BS 1377-2: 1990:
Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: 2300
Job Number: 23-47399-3
Date Sampled: Not Given
Date Received: 26/07/2023
Date Tested: 09/08 - 15/08/2023
Sampled By: Not Given

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

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W] %	Water Content BS EN ISO 17892-1 [W] %	Atterberg				Density			Total Porosity# %		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m															
2761978	TP01	Not Given	1.50	1.60	D	Brownish grey slightly gravelly clayey SAND	Atterberg 4 Point	15		94	25	14	11						
2761979	TP05	Not Given	1.30	1.40	D	Brown slightly gravelly sandy slightly silty CLAY	Atterberg 4 Point	26		86	38	23	15						
2761980	TP11	Not Given	2.00	2.10	D	Yellowish brown slightly gravelly slightly sandy silty CLAY	Atterberg 4 Point	38		98	59	32	27						
2761981	BH01	Not Given	3.00	3.45	D	Brownish grey gravelly sandy CLAY	Atterberg 4 Point	14		65	36	18	18						
2761984	TP06	Not Given	1.60	1.70	D	Brownish grey slightly gravelly sandy silty CLAY	Atterberg 4 Point	26		93	40	24	16						
2761985	BH02	Not Given	1.20	1.65	D	Brownish grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	25		99	49	24	25						
2761987	BH04	Not Given	1.30	1.40	D	Brownish grey slightly gravelly slightly silty CLAY	Atterberg 4 Point	52		97	71	30	41						
2761988	BH04	Not Given	3.40	3.50	D	Brownish grey slightly gravelly very sandy CLAY	Atterberg 4 Point	13		78	33	18	15						
2761990	BH03	Not Given	2.00	2.45	D	Brownish grey gravelly very sandy CLAY	Atterberg 4 Point	23		39	31	17	14						
2761991	BH03	Not Given	4.00	4.45	D	Brownish grey slightly gravelly very sandy CLAY	Atterberg 4 Point	14		69	34	16	18						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Katarzyna
Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street.,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 09/08 - 15/08/2023

Sampled By: Not Given

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type							
2761978	TP01	Not Given	1.50	1.60	D	Brownish grey slightly gravelly clayey SAND		15	Sample was quartered, oven dried at 108.6 °C			
2761979	TP05	Not Given	1.30	1.40	D	Brown slightly gravelly sandy slightly silty CLAY		26	Sample was quartered, oven dried at 108.6 °C			
2761980	TP11	Not Given	2.00	2.10	D	Yellowish brown slightly gravelly slightly sandy silty CLAY		38	Sample was quartered, oven dried at 108.6 °C			
2761981	BH01	Not Given	3.00	3.45	D	Brownish grey gravelly sandy CLAY		14	Sample was quartered, oven dried at 108.6 °C			
2761984	TP06	Not Given	1.60	1.70	D	Brownish grey slightly gravelly sandy silty CLAY		26	Sample was quartered, oven dried at 108.6 °C			
2761985	BH02	Not Given	1.20	1.65	D	Brownish grey slightly gravelly slightly sandy CLAY		25	Sample was quartered, oven dried at 108.6 °C			
2761987	BH04	Not Given	1.30	1.40	D	Brownish grey slightly gravelly slightly silty CLAY		52	Sample was quartered, oven dried at 108.6 °C			
2761988	BH04	Not Given	3.40	3.50	D	Brownish grey slightly gravelly very sandy CLAY		13	Sample was quartered, oven dried at 108.6 °C			
2761990	BH03	Not Given	2.00	2.45	D	Brownish grey gravelly very sandy CLAY		23	Sample was quartered, oven dried at 106.8 °C			
2761991	BH03	Not Given	4.00	4.45	D	Brownish grey slightly gravelly very sandy CLAY		14	Sample was quartered, oven dried at 106.8 °C			

Comments:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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4041

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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



Environmental Science

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 15/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761982

Hole No.: TP01

Sample Reference: Not Given

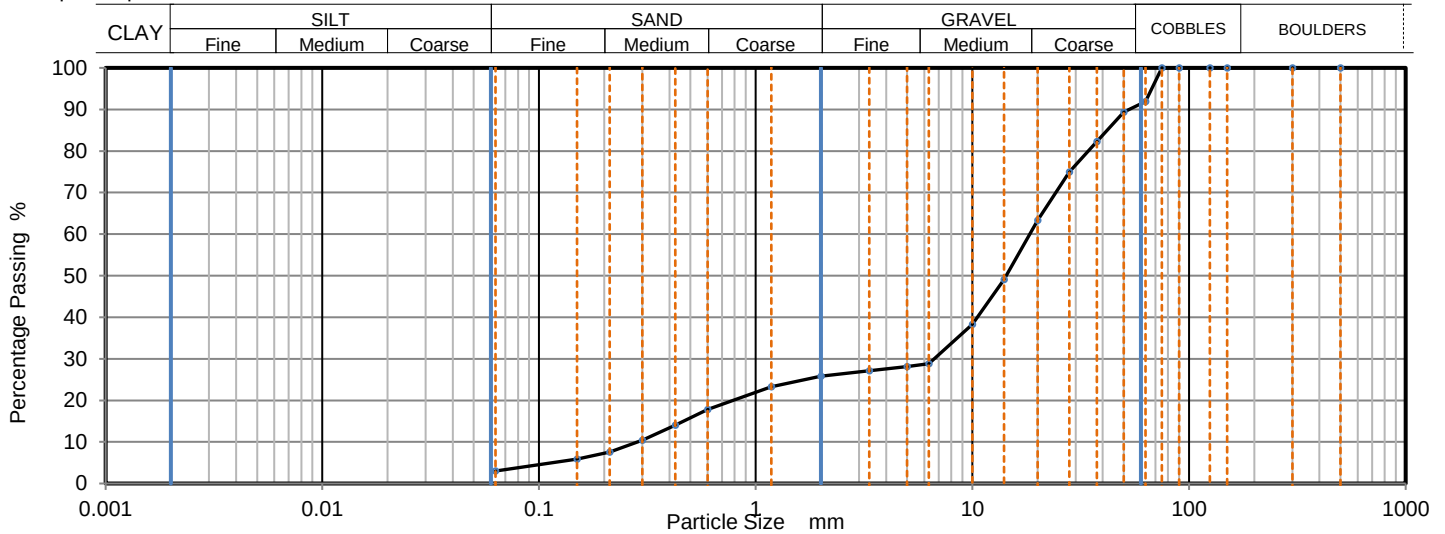
Sample Description: Brown sandy GRAVEL

Sample Preparation: Sample was quartered, oven dried at 106.2 °C and broken down by hand.

Depth Top [m]: 2.40

Depth Base [m]: 2.50

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	92		
50	89		
37.5	82		
28	75		
20	63		
14	49		
10	38		
6.3	29		
5	28		
3.35	27		
2	26		
1.18	23		
0.6	18		
0.425	14		
0.3	10		
0.212	8		
0.15	6		
0.063	4		

Sample Proportions	% dry mass
Very coarse	8
Gravel	66
Sand	22
Fines <0.063mm	4

Grading Analysis	
D100	mm 75
D60	mm 18.4
D30	mm 6.67
D10	mm 0.284
Uniformity Coefficient	65
Curvature Coefficient	8.5

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

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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4041



TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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



Client: Westlakes Consulting
Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ
Contact: Tommy Walker
Site Address: Station Works, Bury Road Geotech Testing

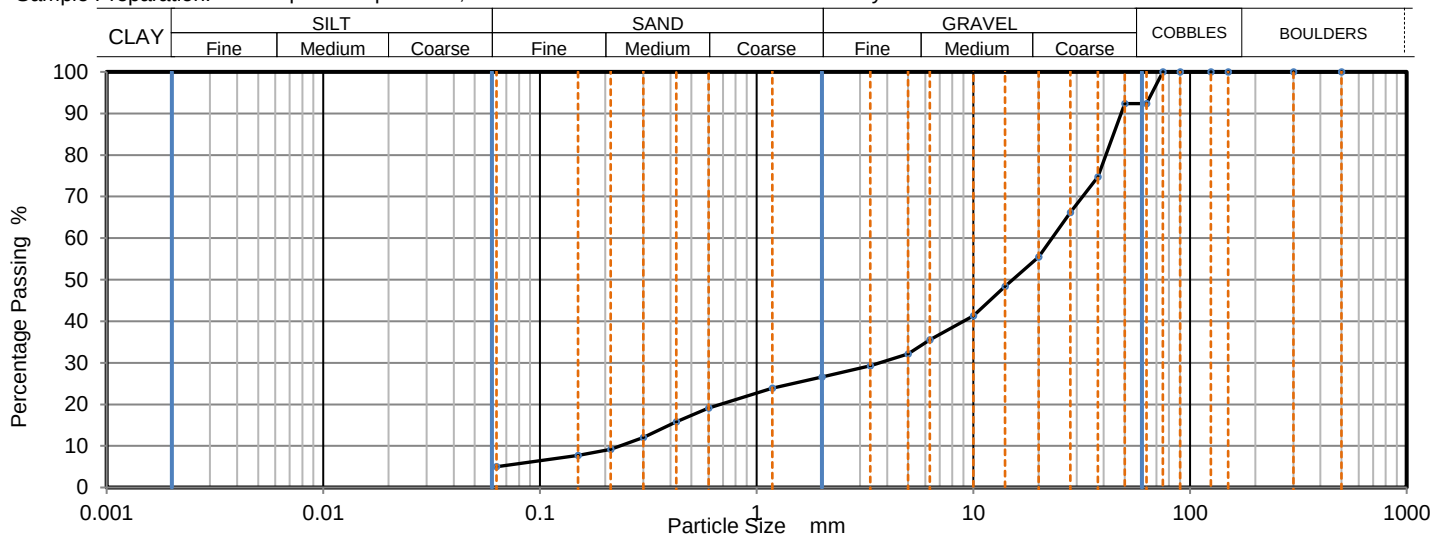
Client Reference: 2300
Job Number: 23-47399-3
Date Sampled: Not Given
Date Received: 26/07/2023
Date Tested: 15/08/2023
Sampled By: Not Given

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

Test Results:

Laboratory Reference: 2761983
Hole No.: TP05
Sample Reference: Not Given
Sample Description: Yellowish brown sandy GRAVEL
Sample Preparation: Sample was quartered, oven dried at 106.9 °C and broken down by hand.

Depth Top [m]: 1.80
Depth Base [m]: 1.90
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	92		
50	92		
37.5	75		
28	66		
20	56		
14	48		
10	41		
6.3	36		
5	32		
3.35	29		
2	27		
1.18	24		
0.6	19		
0.425	16		
0.3	12		
0.212	9		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Very coarse	8
Gravel	66
Sand	21
Fines <0.063mm	6

Grading Analysis	
D100	mm 75
D60	mm 23
D30	mm 3.71
D10	mm 0.235
Uniformity Coefficient	98
Curvature Coefficient	2.5

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

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 11/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761986

Hole No.: BH02

Sample Reference: Not Given

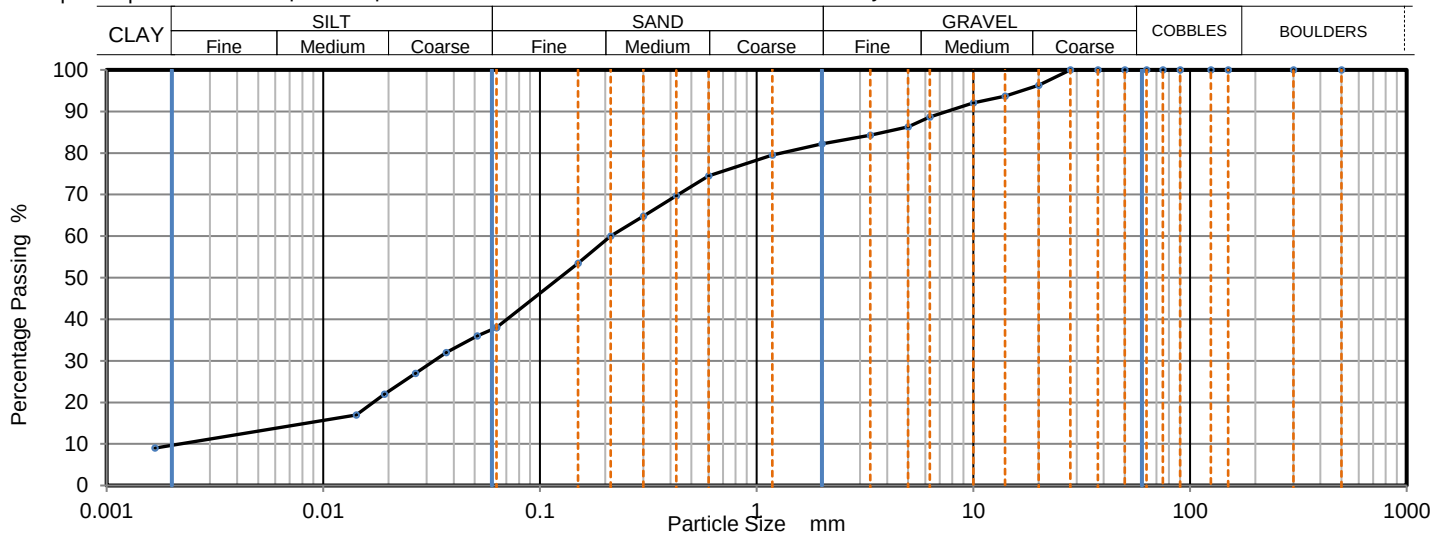
Sample Description: Brownish grey clayey SAND

Sample Preparation: Sample was quartered, oven dried at 108.6 °C and broken down by hand.

Depth Top [m]: 2.00

Depth Base [m]: 2.45

Sample Type: D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	38
300	100	0.0512	36
150	100	0.0369	32
125	100	0.0266	27
90	100	0.0191	22
75	100	0.0142	17
63	100	0.0117	9
50	100		
37.5	100		
28	100		
20	96		
14	94		
10	92		
6.3	89		
5	86		
3.35	84	Particle density (assumed) 2.65 Mg/m3	
2	82		
1.18	80		
0.6	75		
0.425	70		
0.3	65		
0.212	60		
0.15	54		
0.063	38		

Sample Proportions	% dry mass
Very coarse	0
Gravel	18
Sand	44
Silt	28
Clay	10

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	110
Curvature Coefficient	2.7

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

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: Replaces Analytical Report Number 23-47399, issue no 2; Additional results of sedimentation

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

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



Environmental Science

4041

Client: Westlakes Consulting

Client Address: Unit 2.1., 20 Dale Street,,
Manchester, M1 1EZ

Contact: Tommy Walker

Site Address: Station Works, Bury Road Geotech Testing

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

Client Reference: 2300

Job Number: 23-47399-3

Date Sampled: Not Given

Date Received: 26/07/2023

Date Tested: 15/08/2023

Sampled By: Not Given

Test Results:

Laboratory Reference: 2761989

Hole No.: BH04

Sample Reference: Not Given

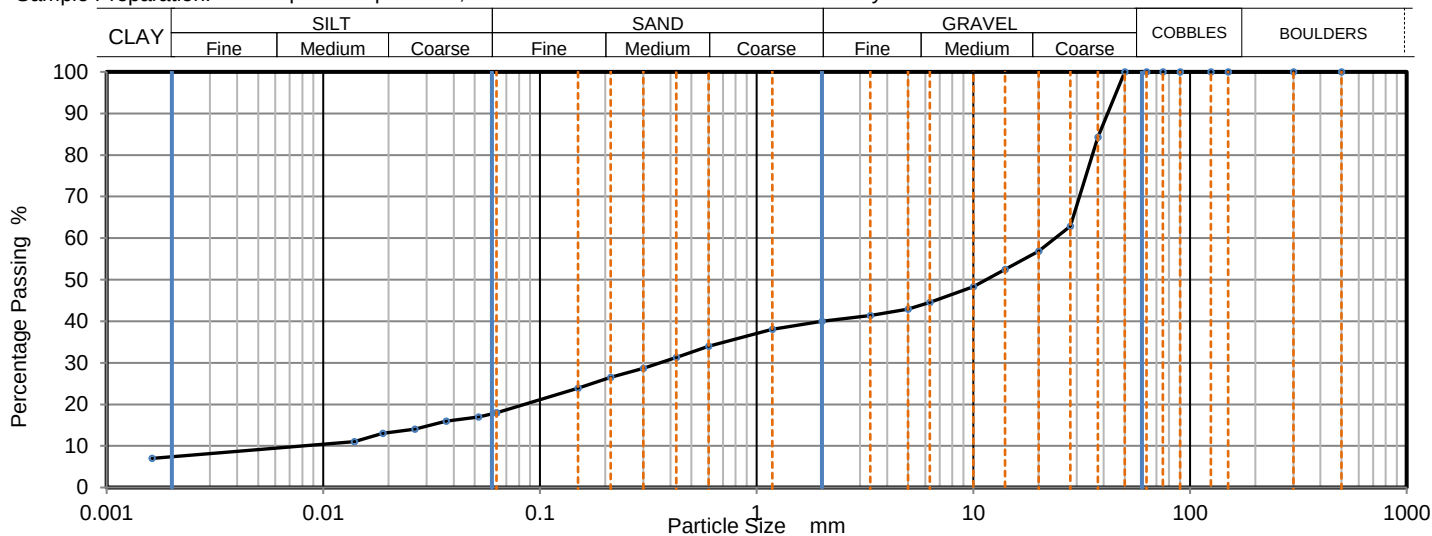
Sample Description: Yellowish brown sandy clayey GRAVEL

Sample Preparation: Sample was quartered, oven dried at 108.3 °C and broken down by hand.

Depth Top [m]: 2.00

Depth Base [m]: 2.45

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	18
300	100	0.0519	17
150	100	0.0369	16
125	100	0.0264	14
90	100	0.0188	13
75	100	0.0139	11
63	100	0.0016	7
50	100		
37.5	84		
28	63		
20	57		
14	53		
10	48		
6.3	45		
5	43		
3.35	41	Particle density (assumed) 2.65 Mg/m3	
2	40		
1.18	38		
0.6	34		
0.425	31		
0.3	29		
0.212	27		
0.15	24		
0.063	18		

Sample Proportions	% dry mass
Very coarse	0
Gravel	60
Sand	22
Silt	10
Clay	8

Grading Analysis	
D100	mm 50
D60	mm 23.8
D30	mm 0.358
D10	mm 0.00722
Uniformity Coefficient	3300
Curvature Coefficient	0.75

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

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:

Katarzyna Koziel

Katarzyna Koziel
Reporting Specialist
for and on behalf of i2 Analytical Ltd

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Appendix 6 – Chemical Test Results

Tommy Walker
Westlakes Consulting
Unit 2.1,
20 Dale Street,
Manchester
M1 1EZ

e: tommy.walker@westlakes.co.uk

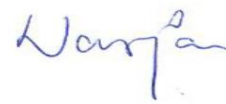
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

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

Analytical Report Number : 23-46396

Replaces Analytical Report Number: 23-46396, issue no. 1
Additional analysis undertaken.
Quantification added for positive sample as per client's request.

Project / Site name:	Station Works, Bury Road	Samples received on:	20/07/2023
Your job number:	2300	Samples instructed on/ Analysis started on:	21/07/2023
Your order number:	2023_205	Analysis completed by:	17/08/2023
Report Issue Number:	2	Report issued on:	30/08/2023
Samples Analysed:	4 leachate samples - 16 soil samples		



Signed:

Dominika Warjan
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756288	2756289	2756290	2756291	2756292
Sample Reference				TP01	TP02	TP03	TP04	TP04A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	2.70	1.20	1.00	0.40
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	72	< 0.1	< 0.1	22
Moisture Content	%	0.01	NONE	10	6.7	15	25	7.7
Total mass of sample received	kg	0.001	NONE	1.3	1.9	1.3	1.3	1.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	JSW	N/A	N/A	N/A	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8	-	7.1	7.8	11
Electrical Conductivity	µS/cm	10	ISO 17025	110	88	290	54	890
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2600	-	640	220	4800
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.087	-	0.27	0.022	0.56
Total Sulphur	mg/kg	50	MCERTS	2200	-	790	120	1900
Organic Matter (automated)	%	0.1	MCERTS	10	1.1	2.4	1.4	1.4
Redox Potential	mV	-800	NONE	182.7	219.4	123	131.6	18.5

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	5.4	< 0.05	< 0.05	< 0.05	0.25
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05	0.36
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Phenanthrene	mg/kg	0.05	MCERTS	3.7	0.06	0.07	< 0.05	1.9
Anthracene	mg/kg	0.05	MCERTS	0.51	< 0.05	< 0.05	< 0.05	0.44
Fluoranthene	mg/kg	0.05	MCERTS	3.7	< 0.05	0.08	< 0.05	1.7
Pyrene	mg/kg	0.05	MCERTS	2.9	< 0.05	0.06	< 0.05	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	< 0.05	< 0.05	< 0.05	0.57
Chrysene	mg/kg	0.05	MCERTS	1.6	< 0.05	< 0.05	< 0.05	0.62
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.8	< 0.05	< 0.05	< 0.05	0.67
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.74	< 0.05	< 0.05	< 0.05	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05	< 0.05	0.51
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.76	< 0.05	< 0.05	< 0.05	0.27
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05	0.07
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.87	< 0.05	< 0.05	< 0.05	0.31

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	25.7	< 0.80	< 0.80	< 0.80	9.61
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Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	5.1	9.4	12	8.1
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.5	0.4	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	< 0.2	0.4
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	39	17	31	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	94	20	21	19	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	85	11	33	26	220
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	33	34	12	19	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	56	62	85	98

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	22	< 8.0	< 8.0	< 8.0	10
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	200	< 8.0	< 8.0	< 8.0	170
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	220	< 10	< 10	< 10	180

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	4.3	< 2.0	< 2.0	< 2.0	2.7
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	19	< 10	< 10	< 10	13
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	77	< 10	< 10	< 10	81
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	100	< 10	< 10	< 10	97

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Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2##	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1##	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1##	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3##	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	5.4	< 0.05	< 0.05	< 0.05	0.25
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	6.8	< 0.1	< 0.1	< 0.1	0.2
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1##	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1##	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05	0.36
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	1.7	< 0.2	< 0.2	< 0.2	0.3
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.24
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	3.7	0.06	0.07	< 0.05	1.9
Anthracene	mg/kg	0.05	MCERTS	0.51	< 0.05	< 0.05	< 0.05	0.44
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	0.6	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	3.7	< 0.05	0.08	< 0.05	1.7
Pyrene	mg/kg	0.05	MCERTS	2.9	< 0.05	0.06	< 0.05	1.4
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2	< 0.05	< 0.05	< 0.05	0.57
Chrysene	mg/kg	0.05	MCERTS	1.6	< 0.05	< 0.05	< 0.05	0.62
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	1.8	< 0.05	< 0.05	< 0.05	0.67
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.74	< 0.05	< 0.05	< 0.05	0.22

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756288	2756289	2756290	2756291	2756292
Sample Reference				TP01	TP02	TP03	TP04	TP04A
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.70	2.70	1.20	1.00	0.40
Date Sampled				18/07/2023	18/07/2023	18/07/2023	18/07/2023	18/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.4	< 0.05	< 0.05	< 0.05	0.51
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.76	< 0.05	< 0.05	< 0.05	0.27
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05	0.07
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.87	< 0.05	< 0.05	< 0.05	0.31

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 081	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 105	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 114	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 118	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 123	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 126	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 156	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 157	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 167	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 169	mg/kg	0.001	NONE	-	-	-	-	-
PCB Congener 189	mg/kg	0.001	NONE	-	-	-	-	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-	-	-	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	24	25	26	22	15
Total mass of sample received	kg	0.001	NONE	1.3	1.4	1.3	1.5	1.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	JSW	JSW	JSW	N/A	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	6.4	6.3	7.4	8
Electrical Conductivity	µS/cm	10	ISO 17025	130	110	110	79	200
Total Sulphate as SO ₄	mg/kg	50	MCERTS	250	770	380	120	1100
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.029	0.1	0.08	0.0085	0.081
Total Sulphur	mg/kg	50	MCERTS	360	900	610	64	540
Organic Matter (automated)	%	0.1	MCERTS	6	7.5	5.8	1.5	3.4
Redox Potential	mV	-800	NONE	103.4	137.5	250.6	281.6	251.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.06	1.5	0.08	< 0.05	0.12
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.08	< 0.05	0.14
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1	0.06	< 0.05	0.08
Phenanthrene	mg/kg	0.05	MCERTS	0.28	7.9	0.69	< 0.05	1.3
Anthracene	mg/kg	0.05	MCERTS	0.06	2.2	0.13	< 0.05	0.24
Fluoranthene	mg/kg	0.05	MCERTS	0.59	13	0.92	< 0.05	2.7
Pyrene	mg/kg	0.05	MCERTS	0.56	12	0.76	< 0.05	2.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.32	6	0.36	< 0.05	1.2
Chrysene	mg/kg	0.05	MCERTS	0.27	5.9	0.43	< 0.05	1.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.32	6.6	0.55	< 0.05	1.3
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.17	3.1	0.19	< 0.05	0.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.25	5.7	0.35	< 0.05	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15	3.3	0.21	< 0.05	0.64
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.75	0.06	< 0.05	0.18
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.17	3.6	0.23	< 0.05	0.73

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	3.2	74.8	5.1	< 0.80	13.6
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Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
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	36	39	33	16	26
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	2.3	0.9	< 0.2	0.4
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 (aqua regia extractable)	mg/kg	1	MCERTS	19	20	18	12	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	110	71	19	270
Lead (aqua regia extractable)	mg/kg	1	MCERTS	150	230	230	13	260
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	0.4	0.5	< 0.3	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	25	21	8.7	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	120	94	48	130

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0##	< 5.0##
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	11	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	8.8	< 8.0	< 8.0	< 8.0	25
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	150	13	< 8.0	< 8.0	120
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	160	33	< 10	< 10	140

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	3.7	< 2.0	< 2.0	2.2
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	15	21	< 10	< 10	17
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	240	39	15	< 10	60
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	260	64	16	< 10	79

Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0##	< 5.0##
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0##	< 5.0##
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0##	< 5.0##
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0##	< 5.0##
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Analytical Report Number: 23-46396

Project / Site name: Station Works, Bury Road

Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2##	< 0.2##	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1##	< 0.1##	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1##	< 0.1##	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3##	< 0.3##	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	0.06	1.5	0.08	< 0.05	0.12
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	0.6	< 0.1	< 0.1	0.2
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1##	< 0.1##	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1##	< 0.1##	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	1.7	0.08	< 0.05	0.14
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	0.5	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1	0.06	< 0.05	0.08
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.28	7.9	0.69	< 0.05	1.3
Anthracene	mg/kg	0.05	MCERTS	0.06	2.2	0.13	< 0.05	0.24
Carbazole	mg/kg	0.3	MCERTS	< 0.3	0.5	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	< 0.3	0.4	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	0.59	13	0.92	< 0.05	2.7
Pyrene	mg/kg	0.05	MCERTS	0.56	12	0.76	< 0.05	2.3
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.32	6	0.36	< 0.05	1.2
Chrysene	mg/kg	0.05	MCERTS	0.27	5.9	0.43	< 0.05	1.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.32	6.6	0.55	< 0.05	1.3
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.17	3.1	0.19	< 0.05	0.6

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756293	2756294	2756295	2756296	2756297
Sample Reference				TP05	TP06	TP07	TP08	TP09
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	0.30	0.70	1.00	0.40
Date Sampled				18/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.25	5.7	0.35	< 0.05	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15	3.3	0.21	< 0.05	0.64
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.75	0.06	< 0.05	0.18
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.17	3.6	0.23	< 0.05	0.73

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 081	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 105	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 114	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 123	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 126	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 156	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 157	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 167	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 169	mg/kg	0.001	NONE	-	-	< 0.001	-	-
PCB Congener 189	mg/kg	0.001	NONE	-	-	< 0.001	-	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-	-	< 0.012	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.5	15	8.8	16	12
Total mass of sample received	kg	0.001	NONE	1.3	1.5	1.3	1.1	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Not-detected	-	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	0.002
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	0.002
Asbestos Analyst ID	N/A	N/A	N/A	JSW	N/A	JSW	N/A	DSA

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.3	7.3	7.9	7.5	7.2
Electrical Conductivity	µS/cm	10	ISO 17025	150	98	130	140	240
Total Sulphate as SO ₄	mg/kg	50	MCERTS	280	540	600	160	530
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.033	0.082	0.023	0.032	0.23
Total Sulphur	mg/kg	50	MCERTS	290	400	410	110	650
Organic Matter (automated)	%	0.1	MCERTS	2.1	4	1.7	0.8	3
Redox Potential	mV	-800	NONE	241.6	274.8	248.4	251	246.9

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.2	0.09	0.12	< 0.05	0.11
Acenaphthylene	mg/kg	0.05	MCERTS	0.3	< 0.05	0.12	< 0.05	0.07
Acenaphthene	mg/kg	0.05	MCERTS	3.5	0.1	0.24	< 0.05	0.27
Fluorene	mg/kg	0.05	MCERTS	2.2	0.08	0.22	< 0.05	0.16
Phenanthrene	mg/kg	0.05	MCERTS	11	0.94	3	0.54	1.6
Anthracene	mg/kg	0.05	MCERTS	5.3	0.18	0.79	0.19	0.59
Fluoranthene	mg/kg	0.05	MCERTS	26	1.9	6.5	1.2	6.2
Pyrene	mg/kg	0.05	MCERTS	22	1.8	5.7	1	5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	0.86	3.1	0.6	2.2
Chrysene	mg/kg	0.05	MCERTS	8.9	0.91	2.6	0.55	2.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	13	1.2	3.9	0.68	2.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	5.7	0.51	1.7	0.24	1.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	11	0.96	3.6	0.53	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.2	0.61	2.2	0.29	1.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.7	0.19	0.59	0.08	0.33
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.2	0.7	2.3	0.32	1.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	135	11	36.6	6.22	27.6
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Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
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	8.4	24	11	5.7	21
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.6	< 0.2	< 0.2	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 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 (aqua regia extractable)	mg/kg	1	MCERTS	15	18	19	16	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	180	78	53	17	74
Lead (aqua regia extractable)	mg/kg	1	MCERTS	68	170	67	16	93
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	21	21	23	21	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	180	170	100	91	110

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	3.9	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	17	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	31	< 8.0	15	< 8.0	9.9
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	52	< 10	16	< 10	11

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	14	< 2.0	< 2.0	< 2.0	3.5
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	79	< 10	11	< 10	23
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	140	19	52	< 10	47
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	230	26	64	< 10	73

Analytical Report Number: 23-46396

Project / Site name: Station Works, Bury Road

Your Order No: 2023_205

Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloroform	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Toluene	µg/kg	5	MCERTS	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Styrene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0##	< 5.0##	< 5.0##

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0##	< 5.0##	< 5.0##	< 5.0##	< 5.0##
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

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Project / Site name: Station Works, Bury Road

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Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	0.2	0.09	0.12	< 0.05	0.11
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	0.2	0.1	0.1	< 0.1	0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	0.3	< 0.05	0.12	< 0.05	0.07
Acenaphthene	mg/kg	0.05	MCERTS	3.5	0.1	0.24	< 0.05	0.27
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	1	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	2.2	0.08	0.22	< 0.05	0.16
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	11	0.94	3	0.54	1.6
Anthracene	mg/kg	0.05	MCERTS	5.3	0.18	0.79	0.19	0.59
Carbazole	mg/kg	0.3	MCERTS	0.5	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	1.4	< 0.3	< 0.3	< 0.3	0.4
Fluoranthene	mg/kg	0.05	MCERTS	26	1.9	6.5	1.2	6.2
Pyrene	mg/kg	0.05	MCERTS	22	1.8	5.7	1	5
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	11	0.86	3.1	0.6	2.2
Chrysene	mg/kg	0.05	MCERTS	8.9	0.91	2.6	0.55	2.1
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	13	1.2	3.9	0.68	2.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	5.7	0.51	1.7	0.24	1.2

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 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756298	2756299	2756300	2756301	2756302
Sample Reference				TP10	TP11	BH01	BH01	BH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.90	0.20	1.30	0.60
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Benzo(a)pyrene	mg/kg	0.05	MCERTS	11	0.96	3.6	0.53	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.2	0.61	2.2	0.29	1.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.7	0.19	0.59	0.08	0.33
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	6.2	0.7	2.3	0.32	1.4

PCBs

PCB Congener 077	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	-	-	-	-
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	-	-	-	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	< 0.012	-	-	-	-
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
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	9.6
Total mass of sample received	kg	0.001	NONE	1.3

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-
Asbestos Quantification Total	%	0.001	ISO 17025	-
Asbestos Analyst ID	N/A	N/A	N/A	JSW

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7
Electrical Conductivity	µS/cm	10	ISO 17025	500
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2500
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.43
Total Sulphur	mg/kg	50	MCERTS	1300
Organic Matter (automated)	%	0.1	MCERTS	3.6
Redox Potential	mV	-800	NONE	226.7

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.28
Fluorene	mg/kg	0.05	MCERTS	0.33
Phenanthrene	mg/kg	0.05	MCERTS	4.5
Anthracene	mg/kg	0.05	MCERTS	1.2
Fluoranthene	mg/kg	0.05	MCERTS	7.6
Pyrene	mg/kg	0.05	MCERTS	6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.7
Chrysene	mg/kg	0.05	MCERTS	3.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.48
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	39.4
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Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
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	97
Boron (water soluble)	mg/kg	0.2	MCERTS	1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	90
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5600
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	100
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	290

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0#
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	17
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	130
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	150

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	3.6
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	27
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	100
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	130

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 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
VOCs				
Chloromethane	µg/kg	5	ISO 17025	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0
2,2-Dichloropropane	µg/kg	5	ISO 17025	< 5.0
Chloroform	µg/kg	5	NONE	< 5.0##
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0##
Benzene	µg/kg	5	MCERTS	< 5.0
Carbontetrachloride	µg/kg	5	NONE	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0##
Trichloroethene	µg/kg	5	ISO 17025	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0##
Toluene	µg/kg	5	MCERTS	< 5.0##
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0##
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0
Styrene	µg/kg	5	ISO 17025	< 5.0
Bromoform	µg/kg	5	NONE	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0
Isopropylbenzene	µg/kg	5	ISO 17025	< 5.0
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0##
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0##
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0##



Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Butylbenzene	µg/kg	5	NONE	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0##
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0

Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
SVOCs				
Aniline	mg/kg	0.1	NONE	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	1.3
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.28
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	0.5
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.33
Azobenzene	mg/kg	0.3	NONE	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	4.5
Anthracene	mg/kg	0.05	MCERTS	1.2
Carbazole	mg/kg	0.3	MCERTS	0.3
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2
Anthraquinone	mg/kg	0.3	NONE	0.4
Fluoranthene	mg/kg	0.05	MCERTS	7.6
Pyrene	mg/kg	0.05	MCERTS	6
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.7
Chrysene	mg/kg	0.05	MCERTS	3.2
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	3.6
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	1.4

Analytical Report Number: 23-46396
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023_205

Lab Sample Number				2756303
Sample Reference				BH03
Sample Number				None Supplied
Depth (m)				1.00
Date Sampled				19/07/2023
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.6
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.48
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7

PCBs

PCB Congener 077	mg/kg	0.001	NONE	-
PCB Congener 081	mg/kg	0.001	NONE	-
PCB Congener 105	mg/kg	0.001	NONE	-
PCB Congener 114	mg/kg	0.001	NONE	-
PCB Congener 118	mg/kg	0.001	NONE	-
PCB Congener 123	mg/kg	0.001	NONE	-
PCB Congener 126	mg/kg	0.001	NONE	-
PCB Congener 156	mg/kg	0.001	NONE	-
PCB Congener 157	mg/kg	0.001	NONE	-
PCB Congener 167	mg/kg	0.001	NONE	-
PCB Congener 169	mg/kg	0.001	NONE	-
PCB Congener 189	mg/kg	0.001	NONE	-

Total PCBs – WHO12

Total PCBs	mg/kg	0.012	NONE	-
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U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected



Analytical Report Number: 23-46396
Project / Site name: Station Works, Bury Road
Your Order No: 2023_205

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-PL 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
2756302	BH02	0.60	139	Bitumen	Chrysotile	0.002	0.002

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.



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Environmental Science

Analytical Report Number: 23-46396

Project / Site name: Station Works, Bury Road

Your Order No: 2023_205

Lab Sample Number				2756304	2756305	2756306	2756307
Sample Reference				TP06	TP07	TP11	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.70	0.90	1.00
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status				

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2
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Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	14	40	7	6.8
Boron (dissolved)	µg/l	10	ISO 17025	66	51	54	17
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	2.4	4.2	2.7	3.2
Copper (dissolved)	µg/l	0.7	ISO 17025	34	44	30	25
Lead (dissolved)	µg/l	1	ISO 17025	9.2	14	14	2.5
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.5	4.1	1.1	1.1
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	7	< 4.0	5.9
Zinc (dissolved)	µg/l	0.4	ISO 17025	16	24	19	11

Monoaromatics & Oxygenates

Benzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	ISO 17025	< 3.0	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	10	NONE	< 10	< 10	< 10	< 10



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Environmental Science

Analytical Report Number: 23-46396

Project / Site name: Station Works, Bury Road

Your Order No: 2023_205

Lab Sample Number				2756304	2756305	2756306	2756307
Sample Reference				TP06	TP07	TP11	BH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.70	0.90	1.00
Date Sampled				19/07/2023	19/07/2023	19/07/2023	19/07/2023
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10 _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) _{HS+EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10	< 10

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

Analytical Report Number : 23-46396
Project / Site name: Station Works, Bury Road

* 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 *
2756288	TP01	None Supplied	0.7	Brown gravelly sand with clinker
2756289	TP02	None Supplied	2.7	Brown clay and sand with gravel and stones.
2756290	TP03	None Supplied	1.2	Brown clay and sand.
2756291	TP04	None Supplied	1	Brown clay and sand with vegetation.
2756292	TP04A	None Supplied	0.4	Brown sandy loam with rubble and brick.
2756293	TP05	None Supplied	0.8	Brown clay and sand.
2756294	TP06	None Supplied	0.3	Brown clay and sand with gravel.
2756295	TP07	None Supplied	0.7	Brown clay and sand with vegetation.
2756296	TP08	None Supplied	1	Brown sandy clay.
2756297	TP09	None Supplied	0.4	Brown clay and sand with gravel and vegetation.
2756298	TP10	None Supplied	0.5	Brown sandy clay with gravel and brick.
2756299	TP11	None Supplied	0.9	Brown clay and sand with gravel.
2756300	BH01	None Supplied	0.2	Brown clay and sand with gravel and vegetation.
2756301	BH01	None Supplied	1.3	Brown sandy clay.
2756302	BH02	None Supplied	0.6	Brown loam and sand with gravel and brick.
2756303	BH03	None Supplied	1	Brown loam and sand with gravel and clinker

Analytical Report Number : 23-46396

Project / Site name: Station Works, Bury Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
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.	L039-PL	W	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
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	L038-PL	D	MCERTS
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
Electrical conductivity of soil	Determination of electrical conductivity in soil by electrometric measurement.	In-house method	L031-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Redox Potential of soil	Determination of redox potential in soil by electrometric measurement.	In house method.	L084-PL	W	NONE
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

Analytical Report Number : 23-46396

Project / Site name: Station Works, Bury Road

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
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.	L038-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	ISO 17025
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in leachates (Monoaromatics)	Determination of BTEX and MTBE in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	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.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-46396

Project / Site name: Station Works, Bury Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).

For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).

For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.

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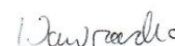
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Analytical Report Number : 23-47225

Project / Site name:	Station Works, Bury Road	Samples received on:	25/07/2023
Your job number:	2300	Samples instructed on/ Analysis started on:	26/07/2023
Your order number:	2023-205	Analysis completed by:	08/08/2023
Report Issue Number:	1	Report issued on:	08/08/2023
Samples Analysed:	2 soil samples		



Signed:

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

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

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

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

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

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

Analytical Report Number: 23-47225
 Project / Site name: Station Works, Bury Road
 Your Order No: 2023-205

Lab Sample Number				2761104	2761105
Sample Reference				BH02	BH04
Sample Number				None Supplied	None Supplied
Depth (m)				1.20	1.20
Date Sampled				20/07/2023	24/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	14
Moisture Content	%	0.01	NONE	26	22
Total mass of sample received	kg	0.001	NONE	1	1.1

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

General Inorganics

Electrical Conductivity	µS/cm	10	ISO 17025	110	270
Organic Matter (automated)	%	0.1	MCERTS	1.6	2
Redox Potential	mV	-800	NONE	120	121.8

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.65
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.1	1.1
Fluorene	mg/kg	0.05	MCERTS	0.1	0.68
Phenanthrene	mg/kg	0.05	MCERTS	0.26	5.6
Anthracene	mg/kg	0.05	MCERTS	0.15	1.6
Fluoranthene	mg/kg	0.05	MCERTS	1.2	4.9
Pyrene	mg/kg	0.05	MCERTS	1.2	4.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.39	1.6
Chrysene	mg/kg	0.05	MCERTS	0.42	1.9
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.49	1.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.17	0.63
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.41	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.28	0.86
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.27
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.25	1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	5.44	28.3
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	12
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	18
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	45
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	130
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	87

Analytical Report Number: 23-47225
Project / Site name: Station Works, Bury Road
Your Order No: 2023-205

Lab Sample Number				2761104	2761105
Sample Reference				BH02	BH04
Sample Number				None Supplied	None Supplied
Depth (m)				1.20	1.20
Date Sampled				20/07/2023	24/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
o-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC6 - EC8 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC8 - EC10 _{HS_1D_AL}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aliphatic >EC10 - EC12 _{EH_CU_1D_AL}	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 _{EH_CU_1D_AL}	mg/kg	2	MCERTS	< 2.0	2.3
TPH-CWG - Aliphatic >EC16 - EC21 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	15
TPH-CWG - Aliphatic >EC21 - EC35 _{EH_CU_1D_AL}	mg/kg	8	MCERTS	< 8.0	61
TPH-CWG - Aliphatic (EC5 - EC35) _{EH_CU+HS_1D_AL}	mg/kg	10	NONE	< 10	79

TPH-CWG - Aromatic >EC5 - EC7 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC7 - EC8 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC8 - EC10 _{HS_1D_AR}	mg/kg	0.1	NONE	< 0.10	< 0.10
TPH-CWG - Aromatic >EC10 - EC12 _{EH_CU_1D_AR}	mg/kg	1	MCERTS	< 1.0	3.7
TPH-CWG - Aromatic >EC12 - EC16 _{EH_CU_1D_AR}	mg/kg	2	MCERTS	< 2.0	3.1
TPH-CWG - Aromatic >EC16 - EC21 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35 _{EH_CU_1D_AR}	mg/kg	10	MCERTS	< 10	17
TPH-CWG - Aromatic (EC5 - EC35) _{EH_CU+HS_1D_AR}	mg/kg	10	NONE	< 10	32

VOCs

Chloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Chloroethane	µg/kg	5	NONE	< 5.0	< 5.0
Bromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Vinyl Chloride	µg/kg	5	NONE	< 5.0	< 5.0
Trichlorofluoromethane	µg/kg	5	NONE	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	5	NONE	< 5.0	< 5.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	5	NONE	< 5.0	< 5.0
Trans 1,2-dichloroethylene	µg/kg	5	NONE	< 5.0	< 5.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	NONE	< 5.0	< 5.0
1,1-dichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
2,2-Dichloropropane	µg/kg	5	NONE	< 5.0#	< 5.0#
Chloroform	µg/kg	5	NONE	< 5.0##	< 5.0##
1,1,1-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2-dichloroethane	µg/kg	5	ISO 17025	< 5.0##	< 5.0##
1,1-Dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Cis-1,2-dichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0
Carbontetrachloride	µg/kg	5	NONE	< 5.0	< 5.0
1,2-dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Trichloroethene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Dibromomethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Bromodichloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Cis-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Trans-1,3-dichloropropene	µg/kg	5	ISO 17025	< 5.0	< 5.0

Analytical Report Number: 23-47225
Project / Site name: Station Works, Bury Road
Your Order No: 2023-205

Lab Sample Number				2761104	2761105
Sample Reference				BH02	BH04
Sample Number				None Supplied	None Supplied
Depth (m)				1.20	1.20
Date Sampled				20/07/2023	24/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0
1,1,2-Trichloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Dibromochloromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Tetrachloroethene	µg/kg	5	NONE	< 5.0	< 5.0
1,2-Dibromoethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Chlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,1,1,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0
p & m-xylene	µg/kg	5	MCERTS	< 5.0	< 5.0
Styrene	µg/kg	5	NONE	< 5.0#	< 5.0#
Bromoform	µg/kg	5	NONE	< 5.0	< 5.0
o-xylene	µg/kg	5	NONE	< 5.0#	< 5.0#
Isopropylbenzene	µg/kg	5	NONE	< 5.0#	< 5.0#
1,1,2,2-Tetrachloroethane	µg/kg	5	ISO 17025	< 5.0	< 5.0
Bromobenzene	µg/kg	5	NONE	< 5.0	< 5.0
N-Propylbenzene	µg/kg	5	NONE	< 5.0#	< 5.0#
2-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0
4-Chlorotoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3,5-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Tert-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
P-Isopropyltoluene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2-dichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0
1,2-Dibromo-3-chloropropane	µg/kg	5	ISO 17025	< 5.0	< 5.0
1,2,4-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0
Hexachlorobutadiene	µg/kg	5	NONE	< 5.0	< 5.0
1,2,3-Trichlorobenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	ISO 17025	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	NONE	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.65

Analytical Report Number: 23-47225
Project / Site name: Station Works, Bury Road
Your Order No: 2023-205

Lab Sample Number				2761104	2761105
Sample Reference				BH02	BH04
Sample Number				None Supplied	None Supplied
Depth (m)				1.20	1.20
Date Sampled				20/07/2023	24/07/2023
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	NONE	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	NONE	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	0.7
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	NONE	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.1	1.1
2,4-Dinitrotoluene	mg/kg	0.2	NONE	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	0.6
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	NONE	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	0.1	0.68
Azobenzene	mg/kg	0.3	NONE	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	0.26	5.6
Anthracene	mg/kg	0.05	MCERTS	0.15	1.6
Carbazole	mg/kg	0.3	MCERTS	< 0.3	0.5
Dibutyl phthalate	mg/kg	0.2	NONE	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	NONE	< 0.3	0.5
Fluoranthene	mg/kg	0.05	MCERTS	1.2	4.9
Pyrene	mg/kg	0.05	MCERTS	1.2	4.4
Butyl benzyl phthalate	mg/kg	0.3	NONE	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.39	1.6
Chrysene	mg/kg	0.05	MCERTS	0.42	1.9
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	0.49	1.7
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	0.17	0.63
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.41	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.28	0.86
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.27
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.25	1

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



Analytical Report Number : 23-47225
Project / Site name: Station Works, Bury Road

* 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 *
2761104	BH02	None Supplied	1.2	Brown clay and sand.
2761105	BH04	None Supplied	1.2	Brown clay and sand with gravel and stones.

Analytical Report Number : 23-47225

Project / Site name: Station Works, Bury Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
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	L038-PL	D	MCERTS
Electrical conductivity of soil	Determination of electrical conductivity in soil by electrometric measurement.	In-house method	L031-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Redox Potential of soil	Determination of redox potential in soil by electrometric measurement.	In house method.	L084-PL	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.	L019-UK/PL	D	NONE
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS

Analytical Report Number : 23-47225

Project / Site name: Station Works, Bury Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	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 300C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

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

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



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Environmental Science

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Analytical Report Number : 23-51564

Project / Site name: Station Works, Bury Road

Samples received on: 17/08/2023

Your job number: 2300

**Samples instructed on/
Analysis started on:** 17/08/2023

Your order number: 2023 225

Analysis completed by: 24/08/2023

Report Issue Number: 1

Report issued on: 25/08/2023

Samples Analysed: 3 water samples

Signed:

Dominika Warjan
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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Environmental Science

Analytical Report Number: 23-51564

Project / Site name: Station Works, Bury Road

Your Order No: 2023 225

Lab Sample Number				2784255	2784256	2784257
Sample Reference				BH01d	BH03d	River (adj)
Sample Number				None Supplied	None Supplied	surface water
Depth (m)				1.85-1.88	2.77-2.80	None Supplied
Date Sampled				16/08/2023	16/08/2023	16/08/2023
Time Taken				1400	1430	1500
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH (L099)	pH Units	N/A	ISO 17025	7.5	7.2	7.7
Electrical Conductivity at 20 °C (L031B)	µS/cm	10	ISO 17025	500	500	200
Sulphate as SO ₄	mg/l	0.045	ISO 17025	41.6	62	19.9
Dissolved Organic Carbon (DOC)	mg/l	0.1	ISO 17025	4.32	2.78	9.81

Hardness - Total	mgCaCO ₃ /l	1	ISO 17025	241	285	83.9
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	54	95	38
Calcium (dissolved)	mg/l	0.012	ISO 17025	82	100	27
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Magnesium (dissolved)	mg/l	0.005	ISO 17025	9	7.5	3.9

Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.53	0.35	0.91
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.02	0.06	< 0.02
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.2	< 0.2	0.6
Copper (dissolved)	µg/l	0.5	ISO 17025	3.7	3.9	7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	4.6	2.4	2.9
Selenium (dissolved)	µg/l	0.6	ISO 17025	7.3	3.3	0.6
Zinc (dissolved)	µg/l	0.5	ISO 17025	5.8	7.7	4.6



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Environmental Science

Analytical Report Number: 23-51564

Project / Site name: Station Works, Bury Road

Your Order No: 2023 225

Lab Sample Number	2784255	2784256	2784257
Sample Reference	BH01d	BH03d	River (adj)
Sample Number	None Supplied	None Supplied	surface water
Depth (m)	1.85-1.88	2.77-2.80	None Supplied
Date Sampled	16/08/2023	16/08/2023	16/08/2023
Time Taken	1400	1430	1500
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status

Monoaromatics & Oxygenates^

Benzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Toluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
p & m-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
o-xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0	< 3.0	< 3.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6## _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8## _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10## _{HS_1D_AL}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35 _{EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35) _{HS+EH_1D_AL_MS}	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10 _{HS_1D_AR}	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35 _{EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35) _{HS+EH_1D_AR_MS}	µg/l	10	NONE	< 10	< 10	< 10

VOCs^

Chloromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Chloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Bromomethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Vinyl Chloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichlorofluoromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trans 1,2-dichloroethylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
2,2-Dichloropropane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Chloroform	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1,1-Trichloroethane	µg/l	3	NONE	< 3.0	5.5	< 3.0
1,2-Dichloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1-Dichloropropene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Cis-1,2-dichloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Benzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Carbontetrachloride	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2-Dichloropropane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trichloroethene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Dibromomethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Bromodichloromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Cis-1,3-dichloropropene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Trans-1,3-dichloropropene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0



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Environmental Science

Analytical Report Number: 23-51564

Project / Site name: Station Works, Bury Road

Your Order No: 2023 225

Lab Sample Number				2784255	2784256	2784257
Sample Reference				BH01d	BH03d	River (adj)
Sample Number				None Supplied	None Supplied	surface water
Depth (m)				1.85-1.88	2.77-2.80	None Supplied
Date Sampled				16/08/2023	16/08/2023	16/08/2023
Time Taken				1400	1430	1500
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
Toluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1,2-Trichloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,3-Dichloropropane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Dibromochloromethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Tetrachloroethene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2-Dibromoethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1,1,2-Tetrachloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Ethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
p & m-Xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Styrene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Bromoform	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
o-Xylene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,1,1,2,2-Tetrachloroethane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Bromobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
n-Propylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
2-Chlorotoluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
4-Chlorotoluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,3,5-Trimethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
tert-Butylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2,4-Trimethylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
sec-Butylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,3-Dichlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
p-Isopropyltoluene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,4-Dichlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2-Dichlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Butylbenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2-Dibromo-3-chloropropane	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2,4-Trichlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
Hexachlorobutadiene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0
1,2,3-Trichlorobenzene	µg/l	3	NONE	< 3.0	< 3.0	< 3.0

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01



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Environmental Science

Analytical Report Number: 23-51564

Project / Site name: Station Works, Bury Road

Your Order No: 2023 225

Lab Sample Number				2784255	2784256	2784257
Sample Reference				BH01d	BH03d	River (adj)
Sample Number				None Supplied	None Supplied	surface water
Depth (m)				1.85-1.88	2.77-2.80	None Supplied
Date Sampled				16/08/2023	16/08/2023	16/08/2023
Time Taken				1400	1430	1500
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
3&4-Methylphenol	µg/l	0.1	NONE	< 0.10	< 0.10	< 0.10

Environmental Forensics

PFOS	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05
PFOA	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05

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



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Environmental Science

Analytical Report Number : 23-51564

Project / Site name: Station Works, Bury Road

Water matrix abbreviations:

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in 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.	L012-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	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.	L039-PL	W	ISO 17025
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
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water after filtration by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	ISO 17025
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 USEPA8260	L073B-PL	W	ISO 17025
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

Analytical Report Number : 23-51564

Project / Site name: Station Works, Bury Road

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
TO - PFOS in water	Analysed by LC-MS in SIM with ISTD correction	In-house method		W	NONE

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 30°C.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

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

^ - Data reported unaccredited due to quality control parameter failure associated with this result; The result should be considered as being deviating and may be compromised.

- Quality control parameter has a high recovery (outside of limit); however the associated result is below the reporting limit, other checks applied prior to reporting the data have been accepted. The result should be considered as being deviating and may be compromised.



Appendix 7 – Infiltration Test Results

CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH01d Test 1

7/26/2023

Raw Data			
Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	0.8	4.2	Medium dense, brown, slightly clayey slightly gravelly SAND
0.25	0.83	4.17	
0.5	0.9	4.1	
0.75	0.95	4.05	
1	1.05	3.95	
1.25	1.12	3.88	
1.5	1.23	3.77	
1.75	1.29	3.71	
2	1.36	3.64	
2.25	1.39	3.61	
2.5	1.4	3.6	
2.75	1.4	3.6	
3	1.4	3.6	
4	1.41	3.59	
5	1.41	3.59	
6	1.42	3.58	
7	1.42	3.58	
8	1.42	3.58	
9	1.42	3.58	
10	1.42	3.58	

50.00 mm

5.00 m

0.002 m²

1.34E-02

4.45

Internal borehole diameter

Depth (total) of borehole

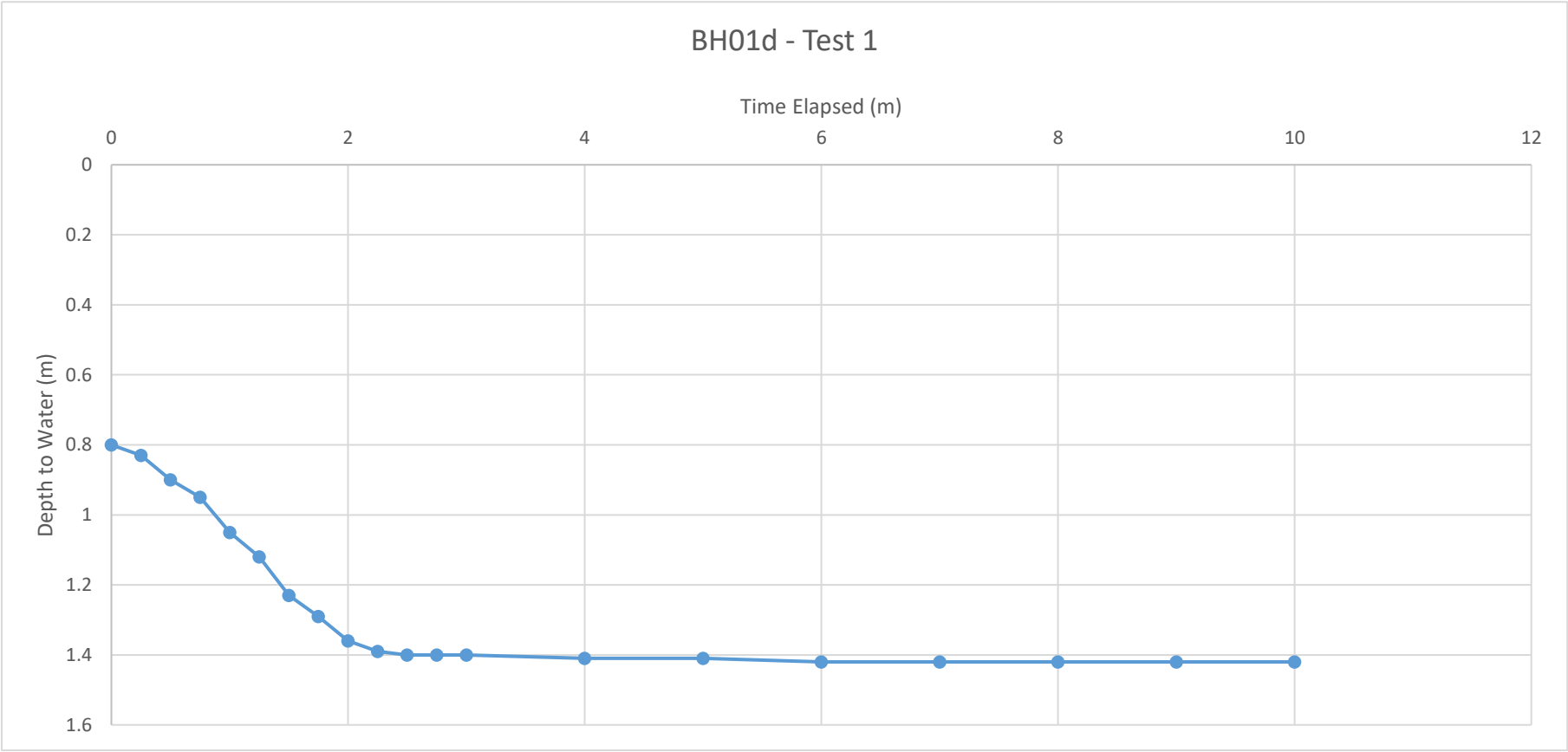
Area of borehole base

Linear regression line

Shape factor

6.02E-06 m/s

Permeability Coefficient (k)



CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH01d Test 2

7/26/2023

Raw Data			
Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	0.6	4.4	Medium dense, brown, slightly clayey slightly gravelly SAND
0.25	0.7	4.3	
0.5	0.79	4.21	
0.75	0.86	4.14	
1	0.94	4.06	
1.25	1	4	
1.5	1.05	3.95	
1.75	1.12	3.88	
2	1.19	3.81	
2.25	1.21	3.79	
2.5	1.23	3.77	
2.75	1.23	3.77	
3	1.24	3.76	
4	1.24	3.76	
5	1.24	3.76	
6	1.24	3.76	
7	1.24	3.76	
8	1.24	3.76	
9	1.24	3.76	
10	1.24	3.76	

50.00 mm

5.00 m

0.002 m²

1.16E-02

4.45

5.21E-06 m/s

Internal borehole diameter

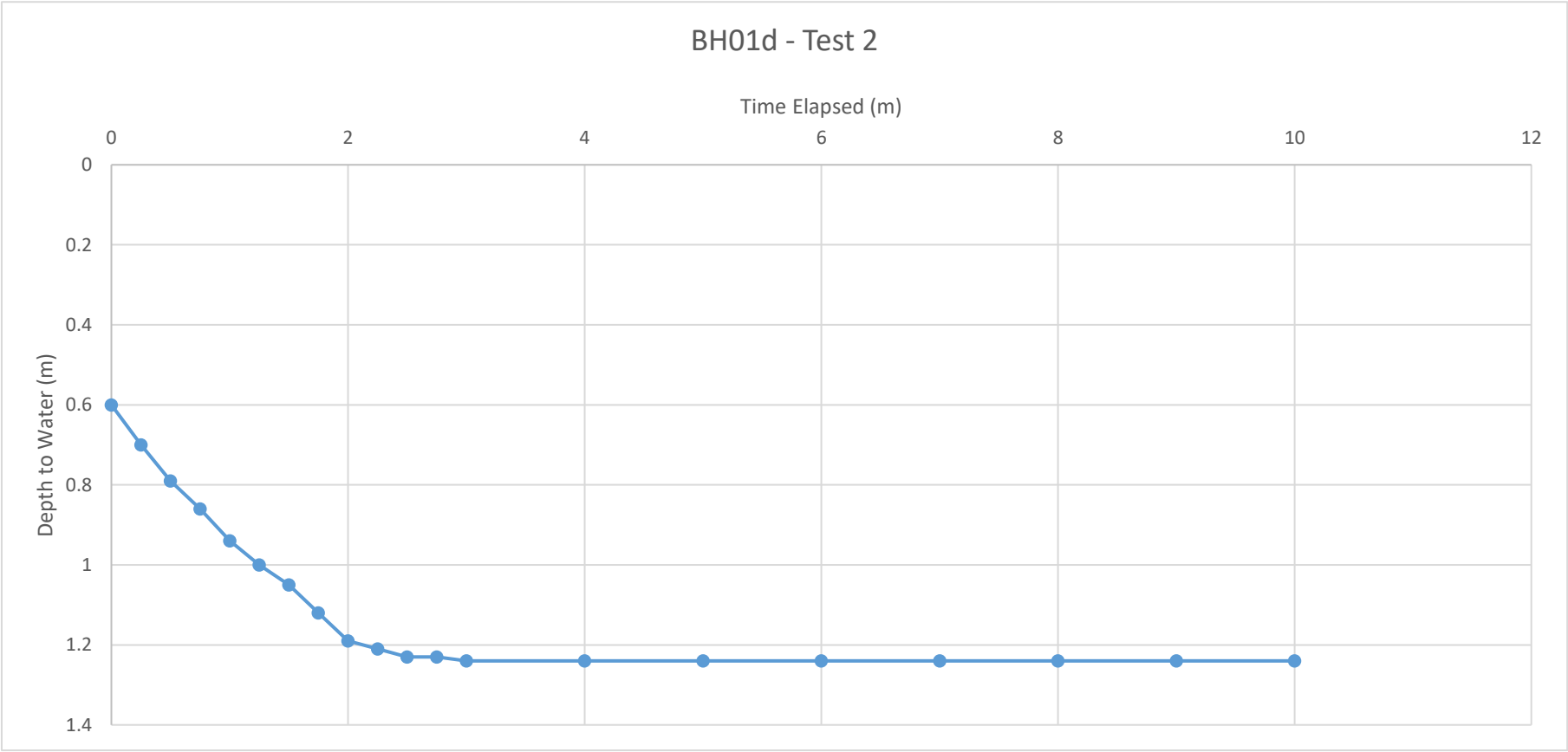
Depth (total) of borehole

Area of borehole base

Linear regression line

Shape factor

Permeability Coefficient (k)



CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH01d Test 3

7/26/2023

Raw Data			
Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	0.72	4.28	Medium dense, brown, slightly clayey slightly gravelly SAND
0.25	0.8	4.2	
0.5	0.88	4.12	
0.75	0.95	4.05	
1	1.02	3.98	
1.25	1.07	3.93	
1.5	1.11	3.89	
1.75	1.17	3.83	
2	1.18	3.82	
2.25	1.19	3.81	
2.5	1.21	3.79	
2.75	1.21	3.79	
3	1.22	3.78	
4	1.23	3.77	
5	1.24	3.76	
6	1.24	3.76	
7	1.25	3.75	
8	1.25	3.75	
9	1.25	3.75	
10	1.25	3.75	

50.00 mm

5.00 m

0.002 m²

9.33E-03

4.45

4.19E-06 m/s

Internal borehole diameter

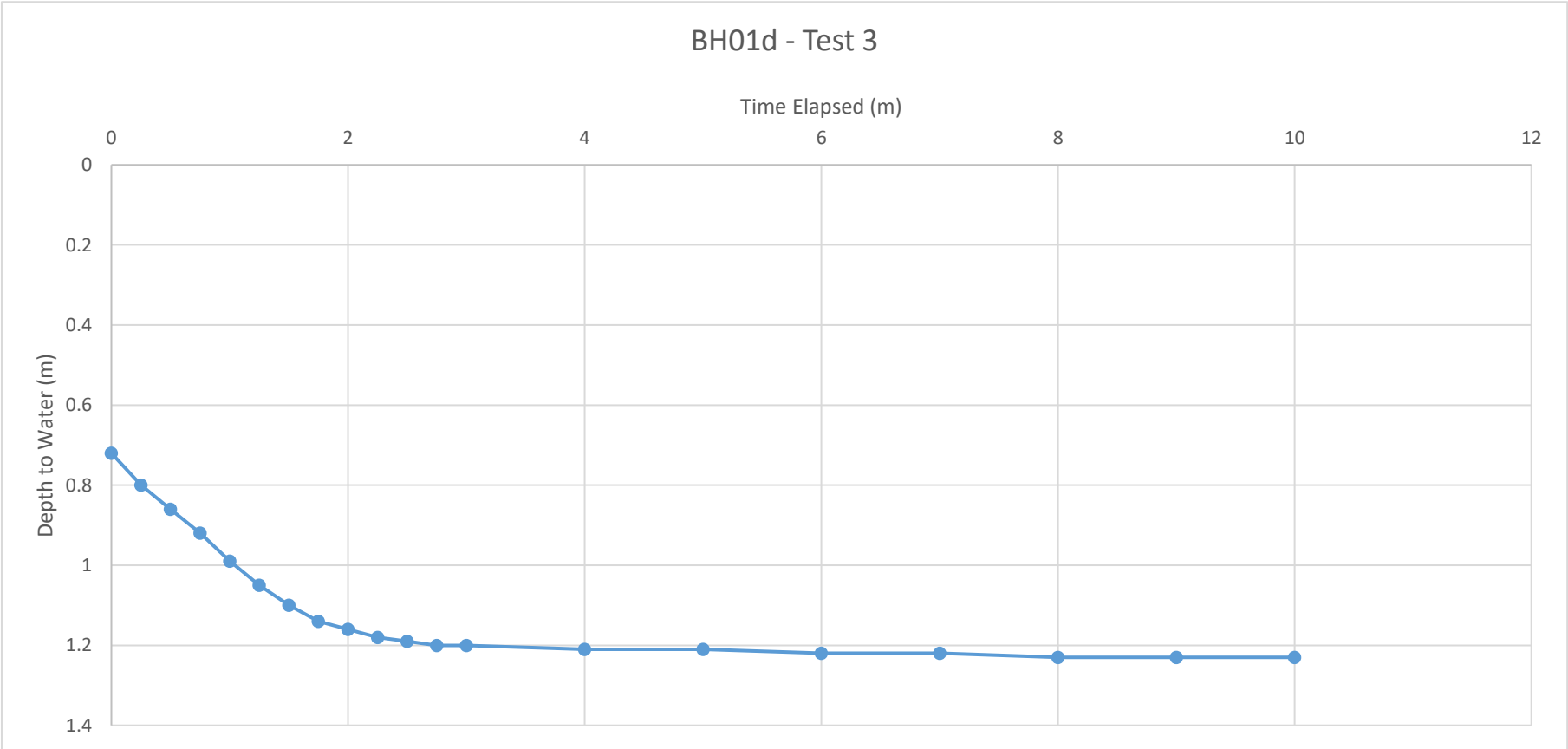
Depth (total) of borehole

Area of borehole base

Linear regression line

Shape factor

Permeability Coefficient (k)



CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH03d Test 1

7/27/2023

Raw Data			
Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	2	1.5	Medium dense, yellow-brown, clayey sandy GRAVEL
0.1	2.02	1.48	
0.2	2.05	1.45	
0.3	2.1	1.4	
0.4	2.15	1.35	
0.5	2.22	1.28	
0.6	2.31	1.19	
0.7	2.34	1.16	
0.8	2.36	1.14	
0.9	2.38	1.12	
1	2.39	1.11	
1.1	2.39	1.11	
1.2	2.4	1.1	
1.3	2.4	1.1	
1.4	2.4	1.1	
1.5	2.41	1.09	
1.6	2.41	1.09	
1.7	2.41	1.09	
1.8	2.42	1.08	
1.9	2.42	1.08	
2	2.43	1.07	
2.5	2.43	1.07	
3	2.43	1.07	
3.5	2.43	1.07	
4	2.43	1.07	
4.5	2.43	1.07	
5	2.44	1.06	

50.00 mm

3.50 m

0.002 m²

2.36E-02

1.70

2.77E-05 m/s

Internal borehole diameter

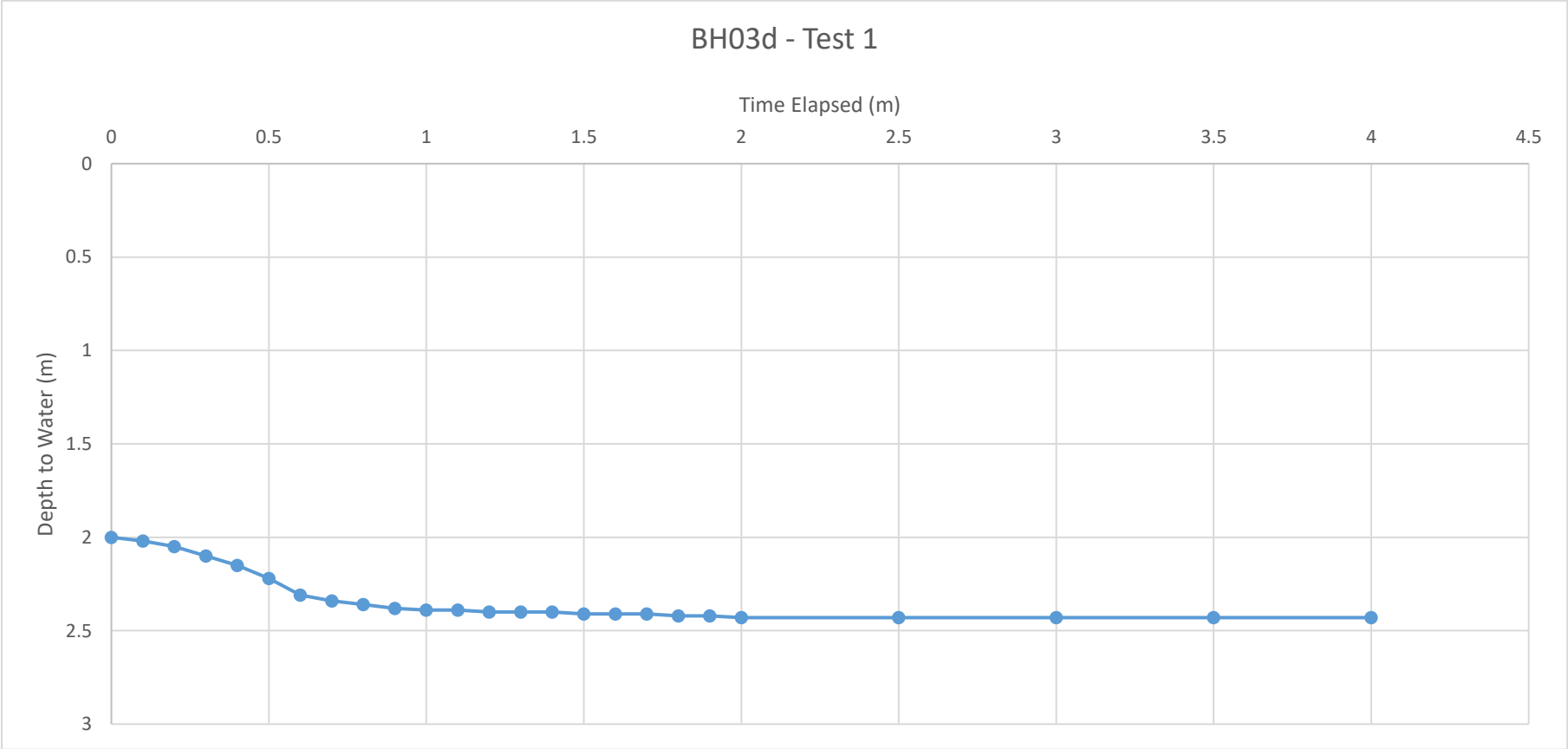
Depth (total) of borehole

Area of borehole base

Linear regression line

Shape factor

Permeability Coefficient (k)



CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH03d Test 2

7/27/2023

Raw Data			
Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	1.89	1.61	Medium dense, yellow-brown, clayey sandy GRAVEL
0.1	1.91	1.59	
0.2	1.93	1.57	
0.3	1.96	1.54	
0.4	1.98	1.52	
0.5	1.99	1.51	
0.6	2.05	1.45	
0.7	2.07	1.43	
0.8	2.09	1.41	
0.9	2.13	1.37	
1	2.15	1.35	
1.1	2.18	1.32	
1.2	2.2	1.3	
1.3	2.21	1.29	
1.4	2.21	1.29	
1.5	2.22	1.28	
1.6	2.22	1.28	
1.7	2.23	1.27	
1.8	2.23	1.27	
1.9	2.23	1.27	
2	2.24	1.26	
2.5	2.25	1.25	
3	2.25	1.25	
3.5	2.25	1.25	
4	2.25	1.25	
5	2.25	1.25	
6	2.26	1.24	
7	2.26	1.24	
8	2.26	1.24	
9	2.26	1.24	
10	2.26	1.24	

50.00 mm

3.50 m

0.002 m²

2.05E-02

1.70

2.41E-05 m/s

Internal borehole diameter

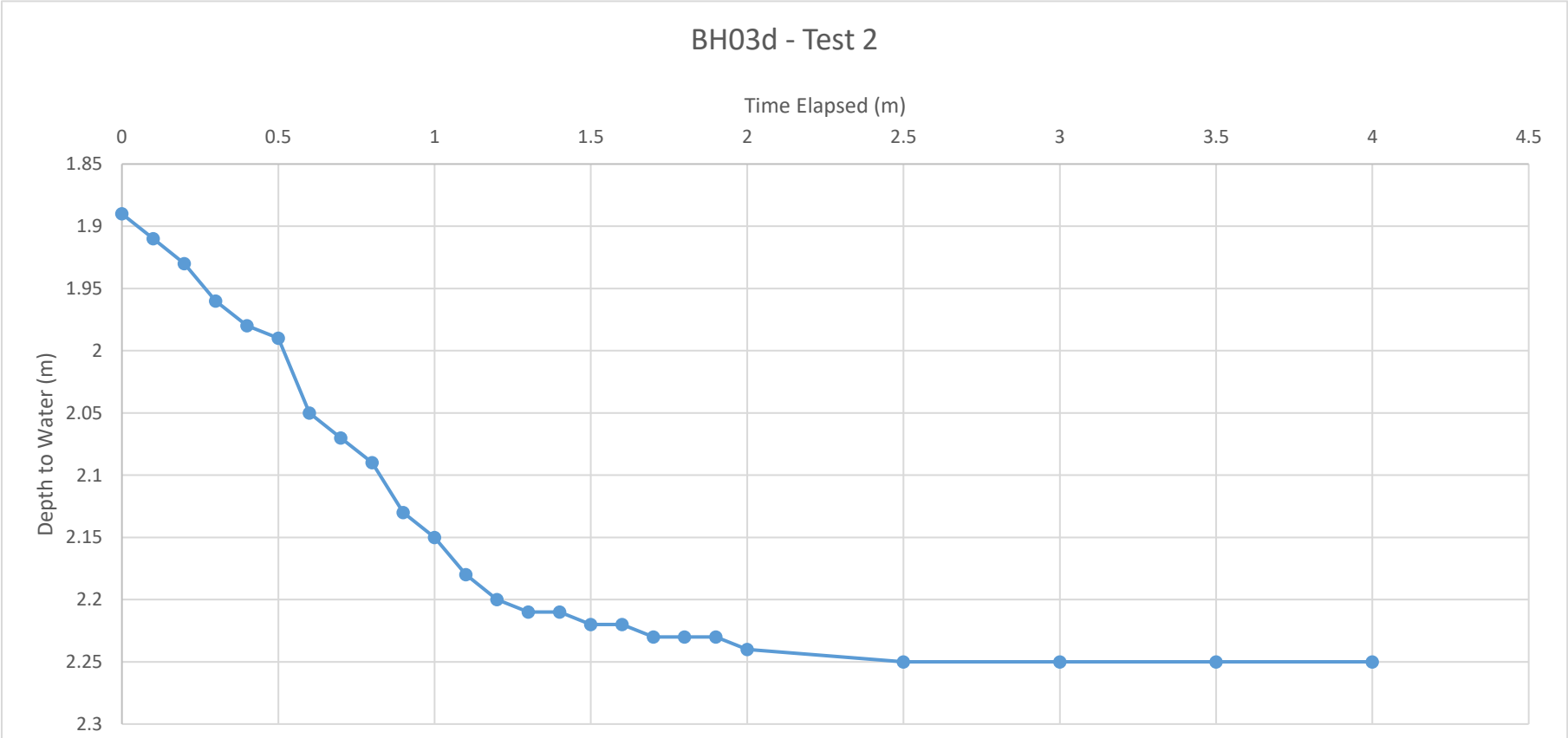
Depth (total) of borehole

Area of borehole base

Linear regression line

Shape factor

Permeability Coefficient (k)



CALCULATION SHEET - SOIL INFILTRATION RATE

Project:

Job Number:

Author:

Test Ref.:

Test Date:

Station Works, Bury Road

2300

TW

BH03d Test 3

7/27/2023

Raw Data

Time elapsed (m)	Depth to water (m)	Head (m)	Stratum
0	1.95	1.55	Medium dense, yellow-brown, clayey sandy GRAVEL
0.1	1.99	1.51	
0.2	2.04	1.46	
0.3	2.06	1.44	
0.4	2.1	1.4	
0.5	2.12	1.38	
0.6	2.14	1.36	
0.7	2.16	1.34	
0.8	2.16	1.34	
0.9	2.18	1.32	
1	2.18	1.32	
1.1	2.19	1.31	
1.2	2.19	1.31	
1.3	2.2	1.3	
1.4	2.2	1.3	
1.5	2.22	1.28	
1.6	2.22	1.28	
1.7	2.22	1.28	
1.8	2.23	1.27	
1.9	2.23	1.27	
2	2.23	1.27	
2.5	2.23	1.27	
3	2.23	1.27	
3.5	2.23	1.27	
4	2.23	1.27	
4.5	2.23	1.27	
5	2.23	1.27	
6	2.23	1.27	
7	2.23	1.27	
8	2.23	1.27	
9	2.23	1.27	
10	2.23	1.27	

50.00 mm

3.50 m

0.002 m²

1.14E-02

1.70

1.33E-05 m/s

Internal borehole diameter

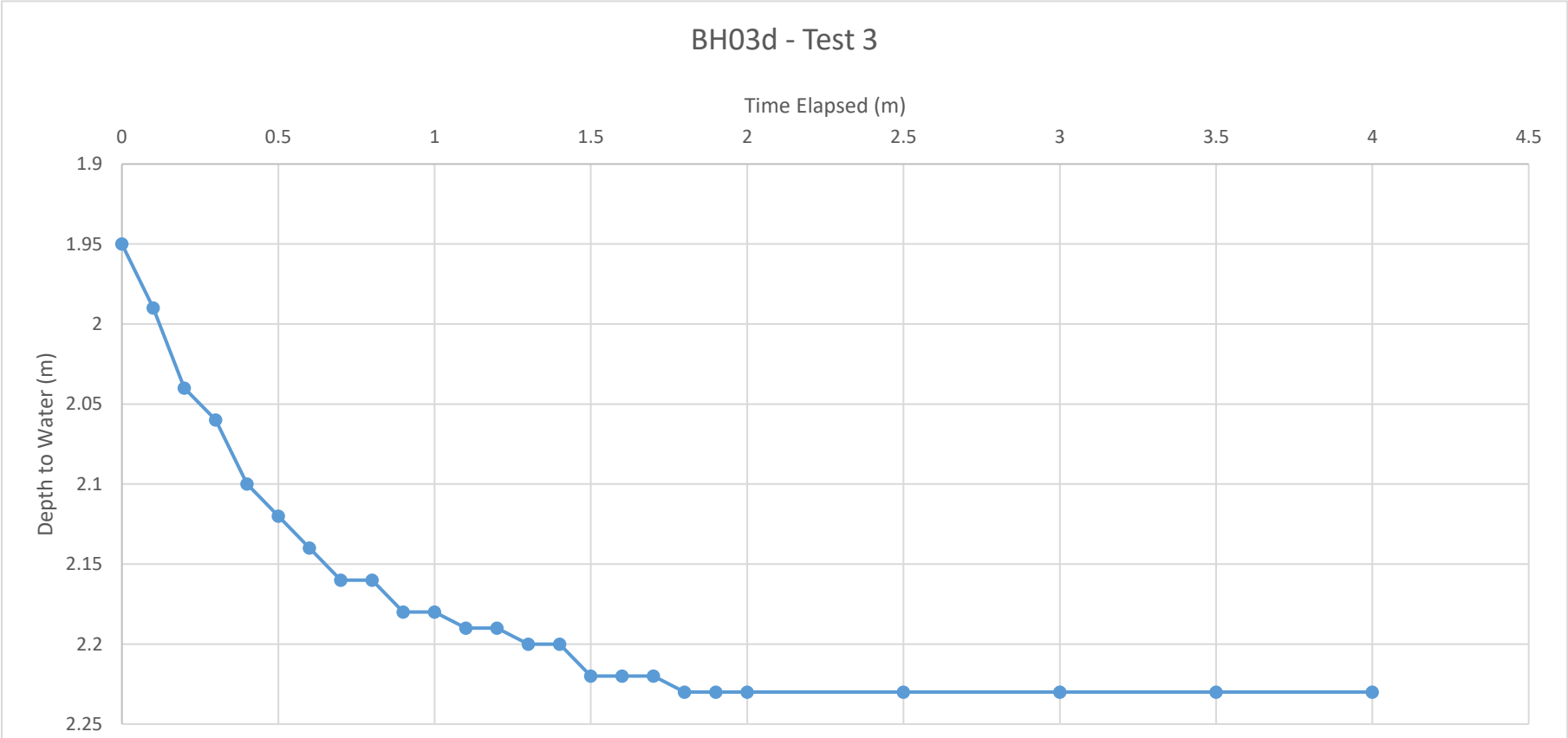
Depth (total) of borehole

Area of borehole base

Linear regression line

Shape factor

Permeability Coefficient (k)





Appendix 8 – Gas Monitoring Results

Site: Station Works, Bury Road

Project No: 2300

Date: 8/9/2023

Personnel: TW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1018	0.0	0.0	0.0	0.0	20.9	20.9	88.2	88.2	-	-	-
BH01s	0.2	0.2	1018	0.0	0.0	1.8	1.8	18.5	18.5	79.9	79.9	-	1.25	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.2	0.2	1018	0.0	0.0	0.3	0.4	13.2	13.2	83.3	83.3	-	1.80	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.2	0.2	1018	0.0	0.0	3.4	3.4	13.2	13.2	83.3	83.3	-	1.05	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.2	0.2	1018	0.0	0.0	0.2	0.2	18.6	18.5	81.2	81.2		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	-0.9	-1.6	1018	0.0	0.0	0.0	0.1	19.8	19.4	80.7	80.7		2.78	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.2	0.2	1018	0.0	0.0	2.1	2.1	14.3	14.3	83.8	83.8		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1018 (Steady)

Ground conditions: Dry, Sunny

All boreholes monitored for gas for 3-5 minutes.

Site: Station Works, Bury Road

Project No: 2300

Date: 8/16/2023

Personnel: TW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1022	0.0	0.0	0.0	0.0	21.0	21.0	87.4	87.4	-	-	-
BH01s	0.2	0.2	1022	0.0	0.0	1.0	1.0	18.4	18.4	80.7	80.7	-	1.34	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.1	0.1	1022	0.0	0.0	0.1	0.1	19.6	19.4	82.7	82.7	-	1.85	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.1	0.1	1022	0.0	0.0	5.3	5.3	9.9	9.9	84.4	84.4	-	1.46	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.3	0.3	1022	0.0	0.0	1.3	1.3	17.5	17.5	81.2	81.2		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	-1.7	-4.3	1022	0.0	0.0	0.4	0.4	18.7	18.7	80.9	80.9		2.77	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.2	0.2	1022	0.0	0.0	1.4	1.4	12.4	12.4	86.2	86.2		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1022 (Steady)

Ground conditions: Dry, Sunny

All boreholes monitored for gas for 3-5 minutes.

Groundwater samples collected from BH01d, BH03d and a river sample adjacent to the site.

Site: Station Works, Bury Road

Project No: 2300

Date: 9/1/2023

Personnel: TW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1011	0.0	0.0	0.0	0.0	21.0	21.0	89.1	89.1	-	-	-
BH01s	0.2	0.2	1011	0.0	0.0	1.9	1.9	18.4	18.4	79.7	79.7	-	1.48	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.0	0.0	1011	0.0	0.0	0.1	0.3	19.9	19.6	80.0	80.0	-	1.97	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.2	0.2	1011	0.0	0.0	5.2	5.2	9.4	9.4	84.9	84.9	-	1.44	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.2	0.2	1011	0.0	0.0	2.5	2.5	16.7	16.7	80.8	80.8		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	-1.6	-4.3	1012	0.0	0.0	2.8	2.8	16.0	16.0	81.1	81.1		2.84	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.2	0.2	1012	0.0	0.0	1.4	1.7	12.0	12.0	86.7	86.7		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1011 (Rising)

Ground conditions: Dry, Sunny

All boreholes monitored for gas for 3-5 minutes.

Site: Station Works, Bury Road
Date: 9/14/2023

Project No: 2300
Personnel: TW/CW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1019	0.0	0.0	0.0	0.0	21.2	21.2	87.6	87.6	-	-	-
BH01s	0.2	0.2	1019	0.0	0.0	2.1	2.1	19.8	19.8	79.2	79.2	-	1.52	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.0	0.0	1019	0.0	0.0	0.6	1.0	20.2	19.9	78.1	78.1	-	2.11	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.1	0.1	1019	0.0	0.0	5.5	5.5	10.6	10.6	84.0	84.0	-	1.66	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.0	0.1	1019	0.0	0.0	3.1	3.2	15.4	15.2	81.5	81.5		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	0.1	0.1	1019	0.0	0.0	4.6	4.6	13.9	13.9	82.0	82.0		2.84	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.0	0.0	1019	0.0	0.0	2.0	2.0	11.3	11.3	86.7	86.7		1.00	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1019 (Steady)

Ground conditions: Dry, Sunny, Wet on Ground

All boreholes monitored for gas for 3-5 minutes.

Site: Station Works, Bury Road

Project No: 2300

Date: 9/22/2023

Personnel: TW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1001	0.0	0.0	0.0	0.0	20.9	20.9	88.2	88.2	-	-	-
BH01s	0.1	0.1	1001	0.0	0.0	2.2	2.2	18.2	18.2	78.5	78.5	-	1.45	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.2	0.4	1001	0.0	0.0	0.2	0.2	20.1	20.1	83.4	83.4	-	1.88	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.3	0.3	1001	0.0	0.0	4.9	4.9	11.7	11.7	82.2	82.2	-	1.40	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.1	0.1	1001	0.0	0.0	2.2	2.2	17.9	17.9	81.1	81.1		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	0.0	0.0	1001	0.0	0.0	1.4	1.4	17.7	17.7	79.2	79.2		2.88	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.3	0.3	1001	0.0	0.0	1.9	1.4	13.5	13.5	83.2	83.2		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1001 (Steady)

Ground conditions: Dry, Cloudy and Occassional Rain

All boreholes monitored for gas for 3-5 minutes.

Site: Station Works, Bury Road

Project No: 2300

Date: 10/6/2023

Personnel: TW

Monitoring point reference	Flow rate Litres/hr		Atmospheric pressure range	Methane % V/V		Carbon dioxide % V/V		Oxygen % V/V		Balance %	Balance %	Water Level as Measured from Well Top	Water Level from GL	Well Depth as Measured from Well Top
	Steady	Peak		Steady	Peak	Steady	Peak	Steady	Min					
Start	-	-	1016	0.0	0.0	0.0	0.0	21.0	21.0	85.6	85.6	-	-	-
BH01s	0.3	0.2	1016	0.0	0.0	2.6	2.6	17.2	17.2	80.1	80.1	-	1.15	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01d	0.3	0.3	1016	0.0	0.0	1.1	0.5	15.4	15.4	82.5	82.5	-	1.74	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.2	0.2	1016	0.0	0.0	5.8	5.8	13.2	13.2	85.2	85.2	-	1.00	-
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03s	0.4	0.3	1016	0.0	0.0	0.8	0.8	19.3	19.3	80.3	80.3		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03d	-0.5	-1.3	1016	0.0	0.0	0.0	0.1	19.9	19.9	82.2	82.2		2.66	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	0.1	0.1	1016	0.0	0.0	2.8	2.8	17.6	17.6	83.8	83.8		Dry	
After	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

Atmospheric Pressure: 1016 (Steady)

Ground conditions: Dry, Cloudy

All boreholes monitored for gas for 3-5 minutes.



Appendix 9 – Risk Assessment Information

These tables are based on CIRIA 552 & 665 risk assessment methodology

Classification of Probability

Classification	Definition
High likelihood	There is a pollution linkage and an event that either appears very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such an event would take place, and it is less likely in the short-term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.

Classification of Consequence

Classification	Definition
Severe	Short-term acute risk to human health. Short-term risk of pollution of sensitive water resources. Short-term risk to a particular ecosystem. Catastrophic damage to building/property.
Medium	Chronic damage to human health. Pollution of sensitive water resources. A significant change in a particular organism or ecosystem.
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services. Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in financial loss, or expenditure to resolve. Non-permanent human health effects. Easily repairable effects of damage to buildings, structures and services.



Combination of Consequence vs. Probability

		Consequence			
		Severe	Medium	Mild	Minor
Probability	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Description of Risk and Likely Action Required

Classification	Definition
Very high risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer-term.
Moderate risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not undertaken already) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the long-term.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Human Health Soils Generic Assessment Criteria – Background Information

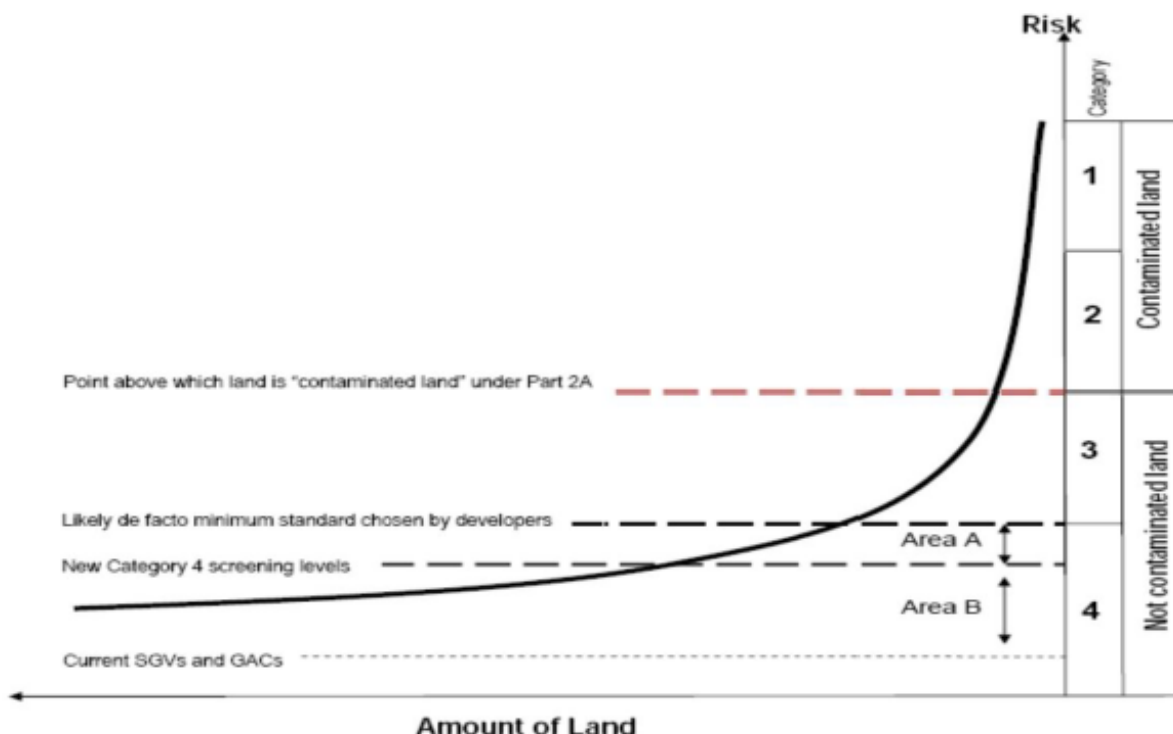
Published UK best practice guidance has been used to assess potential human health risks from contaminants within soils. Generic Assessment Criteria (GAC) have been utilised. Soil contamination test results have been assessed against Suitable 4 Use Levels (S4ULs) which are based on 'minimal' and 'tolerable' risk as adopted by Environment Agency publication SR2. If S4ULs are exceeded, then Category 4 Screening Levels (C4SLs) have been used to assess the test results although it will be stated where this approach has been adopted.

C4SLs are based on a 'Low Level of Toxicological Concern' (LLTC) which is a 'pragmatic intake level that remains sufficiently protective of health but represents a level of concern that is low' rather than 'minimal' or 'tolerable' and as such is less conservative than the S4ULs. There is no S4UL for lead so the C4SL is used.

If the development end use changes then the test results should be reassessed using assessment values more appropriate to that end use.

Current practice during the Generic Quantitative Risk Assessment (GQRA) stage of assessing land affected by contamination is to use generic screening values. These generic screening values have previously taken the form of risk-based Soil Guideline Values (SGVs) or other GAC that are most typically derived using the Environment Agency's Contaminated Land Exposure Assessment (CLEA) model and are based on Health Criteria Values (HCVs) as defined in SR2 (Environment Agency 2009a). The assessment values derived using this approach are based on a minimal or tolerable level of risk and were developed to assist professionals in the assessment of long-term risk to health from human exposure to chemical contamination in soil.

Revised Statutory Guidance to support Part 2A of the Environmental Protection Act 1990 was published by Defra in April 2012 which introduced a new four-category system for classifying land under Part 2A. This four-category system is displayed graphically below:



Category 1 includes land where the level of risk is clearly unacceptable and Category 4 includes land where the level of risk posed is acceptably low. Land is determined as 'contaminated land' under Part 2A if it falls within Categories 1 or 2, such that the Category 2/3 border defines the point at which land is determined under the legislation.



'Category 4 Screening Levels' (C4SLs) have been developed by Defra to provide a simple test for deciding when land is suitable for use and definitely not contaminated land, thereby allowing 'low-risk' land to be dismissed from the need for further risk assessment more quickly and easily and allow regulators to focus efforts on the highest-risk land. The C4SLs are more pragmatic (whilst still strongly precautionary) compared to existing generic screening levels. C4SLs are presented as generic screening criteria for use within a GQRA; although it is acknowledged that they adopt a higher level of risk than previous/existing generic screening levels (i.e. SGVs and GAC produced using HCVs).

In December 2014 Defra published final Category 4 Screening Levels (C4SLs) for six contaminants: arsenic, benzene, benzo(a)pyrene, cadmium, chromium and lead. These C4SL were produced using updated assumptions relating to the modelling of human health exposure to soil contaminants and are based upon a 'Low Level of Toxicological Concern' (LLTC) rather than HCVs however the methodology for deriving both the previous SGVs and the new C4SLs is based on the Environment Agency's CLEA methodology. The LLTC is defined as a 'pragmatic intake level that remains sufficiently protective of health but represents a level of concern that is low' (SP1010, Main Report).

The Part 2A Statutory Guidance and accompanying Impact Assessment were developed on the basis that Category 4 Screening Levels could be used under the planning regime, as they would be in Part 2A investigations directly. Policy responsibility for the National Planning Policy Framework and associated Planning Practice Guidance falls to the Department for Communities and Local Government (DCLG). DCLG's Planning Practice Guidance on Land Affected by Contamination now includes reference to the use of C4SLs in risk assessment under planning.

The C4SLs provide an assessment value where contaminant concentrations below the C4SL present an acceptable level of risk for a given land use whereby the land is suitable for use and definitely not contaminated (i.e. it is in Category 4). Exceeding a C4SL means that further investigation is required, not that the land is necessarily contaminated.

"Where a valid SGV exists for a contaminant where a C4SL has also been derived, it is anticipated that risk assessors will use the C4SL in line with the Part 2A Statutory Guidance. In the absence of a suitable C4SL, risk assessors should identify and select appropriate GAC in accordance with established good practice" (Defra SP1010, Companion Document).

Subsequent to the publication of C4SL; LQM/CIEH have published updated assessment values in 2015 termed LQM/CIEH Suitable 4 Use Levels (S4ULs), which are intended as an update and replacement for the "old" LQM/CIEH GAC. The S4ULs fundamentally differ from the C4SLs in that they remain based on the principals of 'minimal' and 'tolerable' risk enshrined in SR2. Thus, the authors of the LQM/CIEH publication, consider the S4ULs to be equivalent to the SGVs and previous editions of the LQM/CIEH GAC and hence that relevant S4ULs can be used in GQRA under both the planning a Part 2A regimes.

Risks posed to potable drinking water pipes have been considered using the United Kingdom Water Industry Research (UKWIR) Report 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites' to avoid risk from ingestion of tainted drinking waters and corrosion of metal pipework.

Landfill gas risks are assessed using guidance within CIRIA C665 Assessing Risks Posed by Hazardous Ground Gases to Buildings and CLAIRE publication: RB17 A Pragmatic Approach to Ground Gas Risk Assessment Assessing Risks, as well as the NHBC Traffic Light System, if appropriate.



Plant Health Assessment Values

Where landscaped areas form part of the development, risks to plant health have been assessed the using assessment values taken from within 'The code of Good Agricultural Practice for the Protection of Soil', MAFF 1998, BS3882 Specification for Topsoil, Guidance 'Sewerage Sludge on Farmland: Code of Practice for England, Wales and Northern Ireland, DEFRA 2017 and are detailed in the table below.

Plant Health Assessment Value				
Potentially Toxic Elements (PTE)	pH 5-5.5	pH 5.5-6	pH6-7	pH >7
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110

Controlled Waters

Soil samples have been analysed for concentrations of potential contaminants. If significant concentrations of contaminants are measured within the soils, then leachate analysis would be undertaken and results assessed against GAC for controlled water risks, such as EQS freshwater and UK and WHO drinking water standards. Groundwater on-site is not expected to be used as drinking water. Risks to potable water supply pipes are considered using the UKWIR Guidance as part of the human health assessment.

Cementitious Products

Risks to below ground concrete structures have been assessed using recommendations and assessment values taken from BRE Special Digest 1:2005 'Concrete in Aggressive Ground'.

Waste

Waste Acceptance Criteria (WAC) tests are required for disposal of excess spoil as landfill. If generated, then waste should be removed from site by a licenced waste carrier and classified, tested and disposed of appropriately. Acceptance for landfill disposal would rest with the landfill operator.