PHASE 2 GROUND INVESTIGATION FOR RESIDENTIAL DEVELOPMENT ON LAND AT ROWLEY LANE, LEPTON

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APPENDICES

PHASE 2 GROUND INVESTIGATION FOR RESIDENTIAL DEVELOPMENT ON LAND AT ROWLEY LANE, LEPTON

1 INTRODUCTION

FWS Consultants Ltd (FWS) carried out a Phase 2 ground investigation on land at Rowley Lane, Lepton (the 'site') for KCS Development Ltd (the 'Client') to provide information for a residential development across the main site and the proposed additional areas to the south and west for a surface water attenuation basin, pumping station, and a Biodiversity area. The site location is shown on Drawing 3959OD01Rev1, Appendix 1.1.

A Preliminary Contamination Risk Assessment and a separate Coal Mining Risk Assessment had been undertaken in October 2020 for the development, by Betts Geo Environmental Ltd (Refs. 1 & 2), and that information was considered as part of this report.

This report presents the results of the ground investigation carried out between 21 February and 1 March 2022, with an additional phase of investigation on 13 October 2023, which was undertaken in accordance with the principles of current guidance including BS10175:2011+A1:2013 "Code of Practice for the Investigation of Potentially Contaminated Sites" (Ref. 4) and BS 5930:2015+A1:2020 "Code of Practice for Ground Investigations" (Ref. 5).

The original 2022 investigations were focused on the main development area with the following objectives:-

- provide information on ground and groundwater contamination;
- provide information on soil gas conditions;
- provide a Generic Quantitative Risk Assessment in relation to the proposed development and wider environment;
- evaluate the mining instability risk to the development;
- provide geotechnical information for foundation and road pavement subgrade; and,
- provide recommendations on further investigations, where necessary.

The supplementary 2023 investigations included the following objectives:-

- Replacement of the previously damaged / destroyed gas monitoring wells, completion of the gas monitoring programme and gas risk assessment for the main development area;
- Additional investigations in the vicinity of the hotspot locations in the northern area to obtain samples of the topsoil for further chemical testing;
- Following a change to the proposed site boundary, additional areas outside of the original investigation boundary were included to the south and west of the site to accommodate a proposed surface water attenuation basin, a pumping station and a Biodiversity area and investigations of these areas is required.

The following sources of information were utilised in the preparation of this report:-

Previous Reports

FWS Consultants, May 2022, Phase 2 Ground Investigation for Residential Development on Land at Rowley Lane, Lepton, 3959OR01Rev1 (Ref. 3)

2 DEVELOPMENT PROPOSALS

The proposed residential development is for a total of 80no properties with gardens, associated car parking, roads, two public open spaces, three SUDS basins, a pumping station and a Biodiversity area. The development layout as proposed is shown on the Clients Drawing 3284-0-002 O, Appendix 1.2.

3 SITE DESCRIPTION

3.1 Location

The 5.9 ha site is situated on the southern edge of Lepton, at National Grid Reference 419287E, 414630N, as shown in Drawing 3959OD01, Appendix 1.1.

3.2 Topography and Site Features

The site is irregular in shape and comprises several fields used for grazing with field boundaries delineated with trees, hedgerows, fences and stone walls. There are localised mature trees along the field boundaries located across the site. There is a mature wood bordering the site adjacent to the eastern boundary.

The site slopes from northeast to southwest, with ground levels in the north-eastern corner at 147m AOD and ground levels in the southwestern corner at 110m AOD.

3.3 Historical Development of the Site

The desk study (Ref. 1) reports that earliest map from the mid-19th Century shows the site as six separate field enclosures with sporadic trees. A tramway across the northern part of the site to the adjacent Victoria Colliery is shown between 1916 to 1948. In the north-western area is recorded to be a cricket pitch, a small building, and a pavilion at the turn of the 20th Century, until the 1970s. A well is shown on the southeast boundary, present until 1970.

Adjacent to the site was a pond on the northern boundary, which was infilled by 1950. Victoria Colliery between 1906 and 1950 was present immediately northeast of the site boundary. Woodsome Colliery and brickworks is recorded between 1960 to 1970, 200m to the southwest of the site and a firework factory 200m to the northwest. Victoria Colliery and the land to the north was developed after 1970 as residential development and a school.

A summary of the principal historic land uses on and immediately adjacent to the site is shown on Drawing 3959OD03 Appendix 1.1.

4 ENVIRONMENTAL SETTING

4.1 Ground and Groundwater Conditions

Thin made ground may be present in the west of the site, adjacent to the airshaft, and in the vicinity of the decommissioned tramway in the north and the cricket ground to the northwest, as shown on Drawing 3959OD03 Appendix 1.1.

No significant thicknesses of superficial deposits are recorded onsite (Ref. 1).

The site is reported (Ref. 2) to be underlain by the Pennine Lower Coal Measures dipping at around 2° to the northeast, including a thin coal outcropping in the north-eastern corner of the site, mudstone, then the Crow Coal (<0.5m thick) and Kirkburn Sandstone outcropping north to south through the central area, and the Black Bed Coal (~0.5m thick) outcropping 50m to 100m to the west of the western boundary and underlying the site at a depth of around 5m to 15m below ground level (bgl) in the west (~115m AOD) and 40m bgl in the east (~110m AOD). Further to the west of the Black Bed outcrop is the outcrop of the Better Bed Coal, comprising a sequence of 0.45m coal, 0.7 clay and 0.3m of ironstone.

Drawing 3959OD04 Appendix 1.1 illustrates the reported outcrops to these seams, which are expected to have the following vertical separation:

- Thin Coal to Crow Coal ~ 5m.
- Crow Coal to Black Bed Coal ~15m
- Black Bed Coal to the Better Bed Coal ~20-25m

Surface coal workings are reported in the Thin Coal, in the eastern area and may be present in the central area along the reported outcrop of the Crow Coal. Surface coal workings by bell pits and crop workings are also possible along the Black Bed Coal seam outcrop to the west of the site (Drawing No. 3959OD04).

Underground coal workings in the Black Bed and the Better Bed sequence are reported from Victoria Colliery 40m to the north, and Lepton Great Wood Coal Pits 200m to the southeast. The Black Bed Coal seam beneath the site is reported to have unrecorded workings from shallow depth near to the outcrop extending halfway into the site from west to east and then localised recorded workings up to 0.5m thick over the eastern half of the site. The airshaft on the north-western site boundary, is reported to have been around 5m deep, although seam levels in this area are reported to be around 15m bgl (~115m AOD) (Ref. 2) and have been associated with the historic unrecorded workings that was subsequently used to vent the workings from the Victoria Pit (Ref. 2). Three blind headings in this corner of the site are also reported to be at shallow depth in this area.

No shallow ground water table is expected in the superficial deposits and the main water table is expected in the Kirkburn Sandstone. The well in the southern corner of the site appears to have been sunk to the top of this sandstone unit. It is reported (Ref. 2) that the Black Bed workings in this area may be flooded.

4.2 Potential Contamination Sources

The table below summarises the potential sources and nature of contaminants identified from the Desk Study (Ref. 1) as shown in Drawing 3959OD03, Appendix 1:-

Table 1: Potential Contamination Sources

	Source of Potential Contaminants		Potential Contaminants
Onsite	H1	Tramway	Heavy metals, TPH, PAH, solvents, sulphates, pH and asbestos
	H2	Airshaft on western boundary	Mine gas (CO_2 and CH_4) and combustible materials (as colliery shale) adjacent to the shaft.
	H3	Cricket Pitch	Heavy metals, TPH, PAH, sulphates and pH

	Source of Potential Contaminants		Potential Contaminants
	H4	Building in the north-western area	Heavy metals, TPH, PAH, sulphates, pH and asbestos
	H5	Infilled well	Soil gases (CO_2 and CH_4)
	H6	Mine gas	Mine gases (CO_2 and CH_4)
Offsite	H7	Victoria Colliery adjacent to northeastern boundary	Mine gas (CO_2 and CH_4)
	H8	Infilled Pond backfilled 115 years ago	Soil gases (CO_2 and CH_4)

4.3 Potential Geotechnical Constraints

The desk study (Ref. 1) and coal mining risk assessment (Ref. 2) have identified the following potential geotechnical constraints as shown in Drawings 3959OD03 and 04, Appendix 1:-

- Thin heterogeneous made ground of low and variable bearing capacity in the areas of the cricket pitch, an airshaft, and a former building in the north-western area, and along the former tramway in the northern area adjacent to the northern boundary.
- The potential for deep >5m made ground in the north-eastern area, where surface working of the Thin Coal Seam may have occurred, east of its outcrop.
- Unstable ground and potential voids at the locations of the former well in the south and the airshaft in the northwest.
- The potential for shallow mine workings and collapsed ground, presenting a risk of mineral instability in the north-eastern corner of the site, associated with crop workings along the Thin Coal, along the Crow Coals outcrop through the centre of the site and adjacent to the western boundary associated the outcrop of the Black Bed Coal Seam.
- Shallow unrecorded workings and recorded workings in the Black Bed Coal Seam beneath the whole site area at depths of around 5m in the west down to 45m in the east.

5 PREVIOUS INVESTIGATIONS

Previous investigations of this site are summarised below, and the locations of the pervious exploratory holes are shown on Drawing 3959OD05, Appendix 1.

- 21 February to 1 March 2022 – FWS Consultants – Investigations included 17 no. trial pits, 10 no. mini percussion boreholes, 8 no. rotary open boreholes and surface trial trenching over a specified area including geotechnical SPT testing and chemical testing.

6 GROUND INVESTIGATION

6.1 Design Objectives

The ground investigation carried out in February to March 2022 was to determine the following geotechnical and environmental conditions shown on Drawings 3959OD03 and 04, Appendix 1.1 in relation to the proposed development illustrated in Drawing 3284-0-002 O, Appendix 1.2: -

Geotechnical

- Determine the extent, depth and geotechnical conditions of the made ground associated with the cricket pitch, the tramway and the potential localised north-eastern backfilled opencast;
- Determine the location, depth and geotechnical conditions of relic structures associated with the former building and pavilion on the northwest boundary and the former air shaft adjacent to the northwest boundary.
- Determine the extent, depth and geotechnical conditions of superficial deposits.
- Determine the depth, thickness and geometry of shallow coal seams and identify evidence of workings (Thin Coal, Crow Coal and Black Bed Coal) beneath the site.
- Determine the depth to groundwater.

Contamination

- Determine the extent and levels of ground and groundwater contamination in the made ground associated with the cricket pitch, the tramway, the potential backfilled open cast, and the airshaft.
- Determine soil gas emissions associated with the made ground and the backfilled opencast.
- Determine mine gas emissions associated with workings in the Thin Coal, Crow Coal and Black Bed Coal.

The supplementary ground investigation carried out in October 2023 was to determine the following additional geotechnical and environmental conditions:-

Geotechnical

- Determine the extent, depth and geotechnical conditions of superficial deposits in the area of the proposed surface water attenuation basin and pumping station in the southern / western area of the site;
- Determine the depth to groundwater within the area of the proposed surface water attenuation basin and pumping station in the southern / western area of the site.

Contamination

- Replacement of the previously damaged / destroyed gas monitoring wells, completion of the gas monitoring programme and gas risk assessment for the main development area;
- Additional investigations in the vicinity of the hotspot locations in the northern area to obtain samples of the topsoil for further chemical testing; and
- Following a change to the proposed site boundary, undertake additional investigations in the proposed surface water attenuation basin, pumping station and Biodiversity area to obtain samples of the topsoil for further chemical testing.

6.2 Constraints to Ground investigation

In general, there were no constraints on site to the original 2022 or supplementary 2023 ground investigations.

The coal mining investigation was designed to drill all eight boreholes to 30m bgl. Due to the presence of extensive voids associated with mine workings at shallow depth, the loss of water flush returns limited the drilling depth of boreholes RBH2 to 9.2m bgl, RBH3 to 18.7m bgl, RBH4 to 9.2m bgl, RBH5 to 18.9m bgl, RBH6 to 9.4m bgl, RBH7 to 10.5m bgl, and RBH08 to 5.3m.

6.3 Investigation Works Undertaken

Original 2022 Investigation

The following ground investigations were undertaken between 21 February and 2 March 2022. The mini-borehole, trial pit and rotary drilled boreholes are shown on Drawing 3959OD05, Appendix 1.1 and the exploratory logs are provided in Appendix 2. The GPR results are presented in Appendix 5 and the results of the trial trenching to expose evidence of the mine air shaft are recorded in Drawing 3959OD06, Appendix 1.1.

- 17no trial pits (TPs 1-10 and 12-18) were mechanically excavated to depths of between 1.3m to 3.5m.
- Surface trial trenching was carried out over the area of the potential airshaft on the northwestern boundary, within the area shown in Drawing 3959OD06.
- 10no mini percussion boreholes (WS1-10) with Standard Penetration Testing (SPT) to depths of between 1.9m to 3.0m.
- 8no rotary open hole boreholes to depths of between 5.3m and 18.9m bgl.
- Chemical and geotechnical testing.
- Installation of monitoring wells in 5no mini bores (WS01, 02, 04, 06, and 10) to enable subsequent groundwater and gas measurements.

Supplementary 2023 Investigation

The following ground investigations were undertaken on 13 October 2023. The mini percussion boreholes and hand dug pits are shown on Drawing 3959OD08, Appendix 1.1 and the exploratory logs are provided in Appendix 2.

- Reinstallation of monitoring wells in 5no mini percussion boreholes (WS01, WS02, WS04, WS06 and WS10) to enable subsequent groundwater and gas measurements.
- 3no mini percussion boreholes (WS11 to WS13) with Standard Penetration Testing (SPT) to depths of between 2.3 to 4.3 m bgl in the area of the proposed surface water attenuation basin and pumping station.
- 19no hand dug inspection pits (TP01A and TP01B, TP02A and TP02B, TP03A to TP03E, WS04A to WS04E and TP06A to TP06E) were excavated in the vicinity of arsenic hotspots to depths of between 0.25 to 0.40 m bgl.
- 5no hand dug inspection pits (HDP01 to HDP05) were excavated in the proposed Biodiversity area to a depth of 0.25 m bgl.
- Chemical and geotechnical testing.

6.4 Insitu Testing

During drilling of the mini rig boreholes during the original 2022 and supplementary 2023 investigations, SPTs were undertaken at one metre intervals and the results are presented on the logs in Appendix 2.

6.5 Monitoring Undertaken

No made ground was identified in any of the exploratory holes and, as such, the standpipes were reinstalled in the mini percussion bores (WS01, WS02, WS04, WS06, and WS10) to monitor for mine gas emissions with response zones across weathered rockhead and the Glacial Till.

The soil gas monitoring of the 5no standpipes was carried out for methane, carbon dioxide, oxygen, barometric pressure, gas flow and water level, using a Geotechnical Instruments Landfill Gas Monitor (GA5000) with internal flow measurement. Observations of the prevailing weather conditions and measured atmospheric pressure were also recorded. Monitoring was originally undertaken on three occasions from March 2022, however, following damage and loss of a number of the wells during May 2022, replacement monitoring wells were installed in November 2023 and have been monitoring for a further 6 occasions. Monitoring of the reinstalled monitoring wells will commence on the 9 November 2023; these gas monitoring records are included in Appendix 3.

Groundwater level readings within the superficial deposits were taken during the monitoring visits. The results are also presented in Appendix 3.

6.6 Laboratory Testing

6.6.1 Chemical Analysis

Original 2022 Investigation

As detailed in Table 1 Section 4.2, based on the desk study information, potential ground contamination sources had been identified in the northeastern area associated with a possible backfilled opencast, in the northern area associated with a former tramway, and in the north-western area associated with the former locations of a building, a pavilion and an airshaft, as shown on Drawing 3959OD03 Appendix 1.1. The results of the ground investigation undertaken in these areas however, proved no evidence of made ground at any of these locations. As such, chemical testing was undertaken for the suite of determinands, listed in Schedule 1 below, on 6 samples of topsoil, 21 samples of the natural glacial clay and one sample of the weathered mudstone bedrock and the results are presented in Appendix 4.

Schedule 1 – General suite of contaminants including – total phenols, total TPH, arsenic, boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, total cyanide, free cyanide, chloride, PAH (16 priority), pH, total sulphate, water soluble sulphate, TPH (CWG C5-C35), BTEX, asbestos screening and soil organic matter.

All six samples of topsoil were also screened for asbestos.

Supplementary 2023 Investigation

Following refinement of the development proposals, additional areas outside of the original investigation boundary, were included to the south and west of the site to accommodate the proposed surface water attenuation basin, a pumping station and a Biodiversity area. The results of the supplementary ground investigation undertaken in these areas however, proved no evidence of made ground at any of these locations (WS11 to WS13 and HDP01 to HDP05) with the exception of localised thin made ground topsoil comprising sandy gravelly clay and containing sandstone, mudstone and a single piece of ceramics in WS13 to a depth of 0.3 m bgl. As such, chemical testing was undertaken for the suite of determinants, listed in Schedule 1 below, on 4 samples of topsoil and 2 samples of the natural glacial clay and the results are presented in Appendix 4.

Further samples of the shallow topsoil were tested from the vicinity of the previously recorded arsenic hotspots (TP03, TP06 and WS04) including the following:

- TP03A, TP03A, WS04A for Schedule 1; and,
- TP01A-B, TP02 A-B, TP03B-E, TP06B-E and WS04B-E for arsenic only.

Schedule 1 – General suite of contaminants including – total phenols, total TPH, arsenic, boron, cadmium, chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, total cyanide, free cyanide, chloride, PAH (16 priority), pH, total sulphate, water soluble sulphate, TPH (CWG C5-C35), BTEX, asbestos screening and soil organic matter.

6.6.2 Geotechnical Analysis

Original 2022 Investigation

Geotechnical testing was carried out on 18 samples of cohesive glacial till from across the main development area to determine index properties and natural moisture content and the results are included in Appendix 9.

Supplementary 2023 Investigation

Geotechnical testing was carried out on 3 samples of natural cohesive glacial clay and on 2 samples of weathered mudstone bedrock from the areas of the proposed surface water attenuation basin and pumping station to determine natural moisture content and Atterberg Limits and the results are included in Appendix 9.

6.6.3 Quality Assurance and Quality Control

Quality assurance and control of the investigation was implemented in accordance with the following standards and industry guidance:

- Site Investigation Protocols the fieldwork was carried out following the principles of BS 10175:2011+A1:2013 (Ref. 4), BS5930:2015+A1:2020 (Ref. 5) and BS EN ISO 14688 (Ref. 6).
- Sampling Protocols were carried out following the principles of BS 5930:2015+A1:2020 (Ref. 5).
- Insitu testing was carried out following the principles of BS 5930:2015+A1:2020 (Ref. 5) and SPT testing to BS EN ISO 22476-3:2005+A1:2011 (Ref. 7). and BS EN ISO 14688-1:2002 (Ref. 6).
- Soil gas monitoring and reporting was undertaken following the principles of CIRIA 665 (Ref. 8) and BS 8485 (Ref. 9).
- The environmental testing was undertaken by DETS, a MCERTS/UKAS accredited laboratory.
- The geotechnical testing was undertaken by Dunelm Testing Ltd and G2M, both are UKAS accredited laboratories.

6.7 Ground Conditions

6.7.1 General

Main Development Area

The ground investigation proved thin topsoil, of between 0.1 to 0.3 m thick, across the main development area overlying cohesive glacial till, with localised sand lenses, onto rockhead at a depth of between 0.9 m to 3.1 m bgl. Bedrock generally comprised highly weathered mudstone interbedded with sandstone. Thin coal seams (0.1 m to 0.4 m thick) were encountered near surface across the site and evidence of mine workings in the form of voids of between 0.3 m to 0.9 m thick were encountered across the whole site area.

Only localised perched groundwaters were encountered in the cohesive superficial deposits, near to rockhead.

Surface Water Attenuation Basin and Pumping Station (Southern Part of the Site)

The ground investigation proved thin topsoil up to 0.3 m thick, overlying cohesive glacial till, onto rockhead at a depth of between 1.8 to 1.9 m bgl. Bedrock generally comprised distinctly weathered mudstone (generally recovered as a very sandy gravelly clay) to depths of over 2.65 to 4. 3 m bgl.

Localised perched groundwater was encountered in the cohesive superficial deposits in WS13 at a depth of 1.3 m bgl.

Biodiversity Area (Western Part of the Site)

The ground investigation proved thin topsoil to over 0.25 m bgl across the Biodiversity area in the western part of the site.

6.7.2 Hardstanding and Below Ground Structures

No hardstanding or below ground relict structures were identified onsite.

No evidence of below ground structures was recorded in the areas of the former tramway (TP 1 to 3), or former building in the north-western (TP5) part of the site.

Although the GPR Survey (Transect RL08, Appendix 5) reported a potential ground disturbance feature adjacent to the north-western boundary, potentially associated with the former airshaft in this area, trial trenching, illustrated in Drawing 3959OD06 (Appendix 1.1), recorded no evidence of buried structures or made ground in this area.

6.7.3 Topsoil

Topsoil was encountered across the whole site area of between 0.1 m to 0.3 m thick

6.7.4 Made Ground

No made ground was encountered in the areas of the former buildings in the northwest of the site, in the area adjacent to the recorded Air Shaft adjacent to the north-western corner of the site or in the area of potential surface opencast workings in the north-eastern corner of the site, with the exception of natural topsoil with very rare inclusions of metal and ceramics in TP03B and TP06D in the northeast of the site.

Localised made ground, as reworked clay was encountered above a filed drain in the northwestern area Drawing 3959OD06, Appendix 1.1

6.7.5 Superficial Deposits

The superficial deposits underlying the site comprised firm and stiff grey and orange, brown sandy clay and sandy gravelly clay, with fine to coarse gravel of mudstone, sandstone and coal and localised discontinuous lenses of light brown and grey clayey gravelly fine to coarse sand.

These glacial soils were thin extending to depths of between 0.9 m to 3.1 m bgl across the main development area and between 1.8 to 1.9 m in the area of the proposed surface water attenuation basin and pumping station in the south of the site.

6.7.6 Bedrock and Coal Seams

Bedrock generally comprised highly weathered mudstone interbedded with sandstone and was proven at depths of between 0.9 m to 3.1 m bgl.

Thin coal seams (0.1 m to 0.4 m thick) were encountered near surface (2.0 m to 7.4 m) across the site.

Evidence of mine workings in the form of voids and loss of flush returns, generally of between 0.3 m to 0.9 m thick, were encountered across the whole site area at depths of between 4.9 m to 18.6 m bgl. Evidence of ground disturbance, indicative of potential workings was recorded by the GPR survey across the site at depths of between 5 m to 15 m bgl.

Based on the depths of coal or possible workings encountered and the reported outcrops and shallow north-easterly dip (1.9˚) for the seams underlying the site, Table 2 summarises the inferred evidence of coal seams / workings.

Table 2 Summary of Coal Seams and Workings Determined by the Ground Investigation

Area of the Site	Exploratory Hole No.	Rockhead Depth (m)	Depth (m)	Inferred Coal Seam	Intact Coal	Evidence of Workings
North-Eastern Area	TP3	2.2	2.4 – 2.6	?	Intact	None
	RBH1	2.3	7.4 – 7.7	Thin Coal	Intact	None
			16-16.5	Crow Coal	-	Void
	RBH2	2.6	8.3 – 9.2	Crow Coal	-	Void
	RBH4	1.8	8.9 – 9.2	Crow Coal	-	Void
North-Western Area	RBH3	1.7	2.3 – 2.5	Crow Coal	Intact	None
			18.2 – 18.7	Black Bed	-	Void
	RBH5	2.3	12.6 – 18.6	Possible crown hole development above workings in Black Bed		Loss of Flush
			18.6 – 18.9	Black Bed		Void
South- Eastern Area	RBH6	1.6	9.1 – 9.4	Crow Coal	-	Void
	WS6	2	2.8 – 2.9	Thin Coal	Intact	None

Area of the Site	Exploratory Hole No.	Rockhead Depth (m)	Depth (m)	Inferred Coal Seam	Intact Coal	Evidence of Workings
	RBH7	1.8	10.1 – 10.5	Crow Coal	-	Void
	WS9	2	2 – 2.4	Thin Coal	Intact	None
South-Western Area	RBH8	1.8	4.9 – 5.3	Crow Coal	-	Void

6.7.7 Groundwater

Groundwater was only encountered as isolated perched waters in the glacial till or at rockhead in the northwest and northeast of the site at depths of between 0.8 m to 3 m bgl and as a localised perched groundwater in the cohesive superficial deposits in WS13 at a depth of 1.3 m bgl in the south of the site.

Three monitoring visits were undertaken from 8 March 2022, during which groundwater was recorded at depths of between 0.76 m to 2.67 m bgl in all standpipes, except WS10 which was dry.

From the groundwater conditions encountered during the ground investigation and monitoring, it is determined that perched groundwater exists in isolated pockets within the glacial till, with the main groundwater table expected in the Coal Measures strata at depth.

7 MATERIAL PROPERTIES

7.1 Chemical Properties

7.1.1 General

The results of all chemical testing have been compiled into data tables for the initial site investigation for the topsoil and for the glacial soils and mudstone, which are presented in Appendix 6. These tables present the minimum, mean, maximum and US_{95} (where applicable) concentrations of determinands for contaminants detected during the ground investigations and highlight determinands that exceed the Generic Assessment Criteria (GAC) for a residential with gardens development (Appendix 7).

In accordance with CL:AIRE (Ref. 10), a statistical analysis of the chemical results has been undertaken to identify "outlier" concentrations indicative of hotspots, and Upper Confidence Level 95th percentile concentrations (US_{95} values). Where insufficient data exists, maximum concentrations are provided.

Based on the statistical analysis, no outliers associated with the marginal hotspots have been identified by the testing.

7.1.2 Visual/Olfactory Evidence of Contamination

No evidence of visual or olfactory contamination was reported as part of the original 2022 or supplementary 2023 investigations.

7.1.3 Soils - Total Concentrations

The results of the soils testing have been assessed to identify contaminants recorded at concentrations above the GAC (Appendix 7).

None of the topsoil samples tested contained concentrations of contaminants above the GAC, except for arsenic, which was encountered in six of the thirty-one samples analysed at concentrations above the GAC for residential gardens but below the GAC criteria for residential landscaped areas. These localised marginally elevated concentrations of between 39 to 45 mg/kg (GAC 37 mg/kg) were recorded in samples from Trial Pits 2 (TP02B; 40 mg/kg), Trial Pit 3 (TP03; 45 mg/kg), Trial Pit 6 (TP06; 43 mg/kg, TP06A; 42 mg/kg and TP06B; 39 mg/kg) and Mini-bore WS4 (WS04; 44 mg/kg) in the northern area of the site. As noted above, based on the statistical analysis of the dataset-set, no outliers have been identified associated with the marginal exceedances and as such the results are considered to represent one data-set / population for the purposes of this assessment. As no made ground was identified associated with these marginal exceedances and as the 95th Percentile for the data-set is below the GAC limit, it is considered that these marginal exceedances are representative of the natural background concentrations in the area and do not present a significant risk of harm to the proposed development.

In addition, one sample of topsoil (WS6) also contained an elevated total sulphate concentration of 7,470 mg/kg.

None of the glacial soils or mudstone samples tested contained concentrations of contaminants above the GAC.

7.1.4 Asbestos in Soils

Asbestos was not reported to be present in the topsoil samples tested.

7.1.5 Ground Gas/Vapours

Localised made ground was encountered on the site and was less than 0.5 m thick. As such, gas monitoring wells were designed with response zones in the natural till close to rockhead to investigate for mine gas conditions.

The table below presents a summary of the ground gas conditions recorded onsite from the initial post site monitoring visit in 2022.

Table 3: Summary of Ground Gas Conditions

Source Area and Materials	CH_4	CO_2	O_2	Flow Rate	Dates of readings during a period low and falling pressure	Gas Screening Value (GSV) and Characteristic Situation (CS)
	Min and Max Concentrations (%)					
Mine Gas	<0.1% to 0.3%	0.1 to 8.1%	11 to 21.6%	<0.1 to 2 l/hr *1	08/03/2022 09/11/2023 22/11/2023 06/12/2023 20/12/2023	GSV = 2 x (0.3 / 100) = 0.006 (CH_4) GSV = 2 x (8.1 / 100) (CO_2) = 0.162 (CO_2) CS2 *2

*[1] Initial gas flow readings (to 15 l/hr) discounted due to stabilisation of groundwater levels following installation. During the initial monitoring phase elevated peak flow rates were recorded, however, on repeat monitoring steady state flow returned to <0.01l/hr and is generally related to groundwater level changes between the monitoring visits. As a design value we have taken 2 l/hr as an upper flow rate for the purposes of the assessment.

*[2] Due to the elevated carbon dioxide >5% and depressed oxygen concentrations.

Groundwater levels from WS02-2023, WS04-2023 and WS10-2023 are considered to be providing useable data, however boreholes WS01-2023 and WS06-2023 the data provided by these wells is considered to be unusable as the wells are flooded and in particular WS01-2023 is generally recharging as soon as water is removed from the well.

7.2 Geotechnical Properties

7.2.1 General

The geotechnical results from the ground investigations are presented in Appendix 9 and summarised below.

7.2.2 Superficial Deposits

Glacial Till

The whole site is underlain by firm and stiff orange, brown sandy clay and sandy gravelly clay.

Table 4: Summary of Glacial Till Geotechnical Properties

<table>
<tr><th>Parameter</th><th colspan="5">Data Evaluation</th><th>Characteristic Design Value</th></tr>
<tr><td>Moisture Content</td><td colspan="5">Results from 23 tests determined the natural moisture content to range between 8.8 and 32%, with an average of 19.5%.</td><td>Ave MC 19.5%</td></tr>
<tr><td rowspan="4">Plasticity Indices</td><td></td><td>Liquid Limit %</td><td>Plastic Limit %</td><td>Modified Plasticity Index %</td><td>Consistency Index</td><td rowspan="4">The Index test results indicate that the Till is a low to high plasticity clay of low to medium volume change potential.</td></tr>
<tr><td>Min.</td><td>34</td><td>20</td><td>4.75</td><td>0.92</td></tr>
<tr><td>Max.</td><td>60</td><td>34</td><td>28</td><td>1.75</td></tr>
<tr><td>Ave.</td><td>44.3</td><td>24.8</td><td>17.9</td><td>1.3</td></tr>
<tr><td>Undrained Shear Strength</td><td colspan="5">The consistency index of between 0.92 and 1.75 indicates that these soils are of stiff/very stiff consistency which broadly correlates with the site descriptions.
Based on visual observation, the clays are expected to have shear strengths of around 50 – 100 kN/m^2.
Standard Penetration Tests determined ‘N’ values in the range of 11 to 20 (with an average value of 14) for depths generally ranging from 1.2 to 2 m bgl. Using the relationship between SPT ‘N’ values and the Plasticity Index (Ref. 11), undrained shear strength ranges from 60 to 110 kN/m^2.</td><td>For design purposes, a characteristic undrained shear strength of Cu = 60 kN/m^2 is considered suitable.</td></tr>
</table>

Parameter	Data Evaluation	Characteristic Design Value
Coefficient of Compressibility	From empirical correlations between shear strength and SPT N (Ref. 11), Mv values ranging between 0.09 m^2/MN to 0.17 m^2/MN have been determined.	For design purposes, a characteristic Mv design value = 0.13 m^2/MN is considered suitable.
pH and Sulphate	The values for water soluble sulphate, total sulphate and pH values at depths between 0.2 to 1.6 m bgl are:- • water soluble sulphate <10 to 51 mg/l; • total sulphate 117 to 1,110 mg/kg; and, • pH 5.2 to 6.6.	DS1 - AC1

Bedrock

Across the site the bedrock at rockhead predominantly comprised highly weathered very weak mudstone with SPT N values ranging between 14 to >50, with an average SPT N value of 41.

8 CONTAMINATION RISK ASSESSMENT

8.1 Conceptual Site Model

A Conceptual Site Model (CSM) for the proposed residential development has been prepared in accordance with current guidance by consideration of the site-specific Contamination Sources, Receptors and Pathways described in the following sections. A schematic conceptual model of the site is presented in Drawing 3959OD07, Appendix 1.1.

8.2 Contamination Sources

8.2.1 General

The presence of significant contamination hazards has been identified by evaluation of the contaminant concentrations in relation to the GAC developed for this residential development, as presented in Appendix 7. Direct comparison is made between the assessment criteria and the US95 or maximum concentrations and hot spot values to determine which contaminants in which materials present a risk of harm or pollution. In addition, consideration is also given to the potential sources of contamination, identified from the desk study, walkover and visual and olfactory evidence from the ground investigation and soil gas concentrations detected in the monitoring.

8.2.2 Hazards Identified

The hazards to the development and wider environment identified from this investigation are summarised below and schematically presented on the CSM Drawing 3959OD08, Appendix 1.1:-

Table 5: Contamination Sources

	Source of Potential Contaminants		Potential Contaminants
Onsite	H1	Tramway	No evidence of made ground, other than very rare / isolated fragments of metal / ceramics in the topsoil, was identified in the trial pits excavated

	Source of Potential Contaminants		Potential Contaminants
			in this area as part of the original 2022 investigations nor from the additional hand pits excavated as part of the supplementary 2023 investigations in the vicinity of Trial Pits 1, 2 and 3.
	H2	Airshaft on western boundary	No evidence of the airshaft was recorded on site and, as such, this is not considered to represent a contamination hazard to the proposed development. Mine gas emissions could migrate within this feature to surface (CO_2 and CH_4).
	H3	Cricket Pitch	No evidence of made ground was identified in Trial Pits 5, 7, 8, 17 or mini bore WS4 and as such no contamination associated with this previous use is expected.
	H4	Building in the north-western area	No evidence of made ground was identified in Trial Pit 5 and as such no contamination associated with this previous use is expected.
	H5	Infilled well on southeastern boundary	Localised soil gases (CO_2 and CH_4)
	H6	Mine gas	Mine gases (CO_2 and CH_4)
	H7	Topsoil	Topsoil in the northern area has been identified to contain marginally elevated concentrations of Arsenic above the criteria for residential gardens, however, as no made ground was identified associated with these marginal exceedances and as the 95th Percentile for the data-set is below the GAC limit, it is considered that these marginal exceedances are representative of the natural background concentrations in the area and do not present a significant risk of harm to the proposed development.
Offsite	H8	Victoria Colliery adjacent to northeaster boundary	Mine gas (CO_2 and CH_4)
	H9	Infilled Pond backfilled 115 years ago	Soil gases (CO_2 and CH_4)

8.3 Receptor Characterisation

Based on environmental conditions determined, the following site-specific receptors have been identified and are considered within the CSM Drawing 3959OD07, Appendix 1.1: -

Table 6: Receptor Characterisation

Part 2A Classification	Group		Receptor
Part 2A Receptors	R1	Human Health	Future site endusers in buildings and landscaped areas
			Residents/Site users of residential properties within and/or adjacent to the site boundaries
	R2	Property	Proposed development comprising residential properties Drawing 3284-0-002 M in Appendix 1.2.
			Services
	R3		Rivers/Surface water – None in close proximity to the site.

Part 2A Classification	Group		Receptor
	R4	Controlled Waters	Superficial deposits classified as Unproductive Strata. The main waterbody is expected to be at depth within the Coal Measures strata classified as a Secondary A Aquifer. Due to the mining history these groundwaters are expected to be of low water quality.
Non-Part 2A Receptors	R5	Construction workers	
	R6	Plants and landscaped areas	

8.4 Pathway Characterisation

From the site conditions and development layout the following potential pathways by which receptors might be exposed to contaminants, as illustrated in the CSM Drawing 3959OD07, Appendix 1.1: -

Table 7: Pathway Characterisation

Pathway		Receptor
P1	Inhalation, ingestion and dermal contact	Human Health
P2	Direct contact	Plants
P3	Soil gas or soil vapours pooling within the structures	Buildings, Property and Services
	Contact with aggressive or acidic soils or hydrocarbon impacted soils (made ground)	
P4	Leaching of contaminants from the soil migrating vertically or laterally to groundwater	Water Environment

8.5 Generic Quantitative Contamination Risk Assessment

The CSM outlined above and illustrated in Drawing 3959OD07, Appendix 1.1, has been used to undertake a semi quantitative contamination risk assessment for the development site. Details of the approach adopted for this risk assessment are presented in Appendix 8.

From this risk assessment, and reference to the DEFRA Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance 2012 (Ref. 12), the following contaminant linkages have been identified to human health, property, controlled waters and to non-Part 2A receptors including plants and landscaped areas: -

8.5.1 Human Health

Based on this CSM, no potentially unacceptable health risks have been identified to construction workers during development or endusers in garden areas. The topsoil in the northern area has been identified to contain marginally elevated concentrations of Arsenic above the criteria for residential gardens, however, as no made ground was identified associated with these marginal exceedances and as the 95th Percentile for the data-set is below the GAC limit, it is considered that these marginal exceedances are representative of the natural background concentrations in the area and do not present a significant risk of harm to the proposed development.

Gas monitoring undertaken has determined Characteristic Situation 2 conditions in relation to the potential hazards noted in the preceding section (principally mine gas emissions from shallow workings and migration via the air shaft on the western site boundary).

8.5.2 Property

Gas monitoring undertaken has determined Characteristic Situation 2 conditions in relation to the potential hazards noted in the preceding section (principally mine gas emissions from shallow workings and migration via the air shaft on the western site boundary). The gas concentrations recorded only carbon dioxide, and not methane, it currently does not pose a combustion risk to property, only a potential asphyxiation risk to future end users in confined spaces in properties.

8.5.3 Water Environment

No gross or widespread contamination has been proven and, therefore, the ground and groundwater conditions are expected to present a negligible risk to ground and surface waters.

8.5.4 Plants and Landscaped Areas

The topsoil and shallow subsoil across the site contained no significant concentrations of contaminants that present a phytotoxic risk to plants and landscaped areas.

8.6 Recommendations on Remedial Mitigation Measures

8.6.1 Health and Safety Considerations During Construction

Due to the potential for mine gas emissions from shallow workings, normal brownfield health and safety precautions, and gas monitoring prior to entry to below ground excavations should be adopted as a minimum to protect workers.

8.6.2 Measures within Preparatory / Advance Works

No specific remedial measures are required during the site preparatory works.

8.6.3 Measures within Built Development

Materials for in Ground Services

Polyethylene (PE) and polyvinyl chloride (PVC) water supply pipework should be suitable for use within the soils throughout the site.

Based on sulphate results from the current investigation in accordance with Ref. 13, in-ground concrete should be designed for Sulphate Class DS-1, ACEC Class AC1.

Gas Protection Measures

Gas monitoring undertaken has determined Characteristic Situation 2 conditions in relation to the potential hazards noted in the preceding section (principally mine gas emissions from shallow workings and migration via the air shaft on the western site boundary).

9 IDENTIFICATION AND ASSESSMENT OF SITE-SPECIFIC MINING RISK

9.1 Summary of Coal Conditions

From review of the geological maps and the Coal Mining Risk Assessment (Ref. 2), the site may be within the zone of influence from unrecorded and recorded workings in the Thin Coal (<0.5m) outcropping in the northeast, the Crow Coal (<0.5m) outcropping north to south through the centre of the site and from the Black Bed Coal seam (0.5m) underlying the whole site area, all of which dip to the northeast at an angle of around 2°.

Although shallow opencast workings had been identified as a possibility in the Thin Seam in the northeast of the site (Ref. 2), no evidence of made ground was recorded in this area indicative of backfilled surface workings.

Investigation for the mine (air) shaft in the north-western area (Drawing 3959OD06 Appendix 1.1) proved no evidence of the mine shaft onsite. As such, it is considered that the actual location may correspond to that recorded by the Coal Authority and exist ~ 5m offsite from the site boundary.

The trial pits, mini-bores and probe drilling undertaken, as detailed in Section 6.7.6, proved thin coals and workings for which a possible seam interpretation is presented in Table 2. That interpretation determined the following coal sequence beneath the site:

- the Thin Coal is inferred to outcrop ~20 to 40 m west of the Geological Survey conjectural outcrop (Drawing 3959OD04, Appendix 1.1). The seam was proven to be between 0.1 m to 0.4 m thick at an elevation of around 138 m AOD in the southwest dipping to ~136 m AOD adjacent to the north-eastern boundary. No evidence of workings (either shallow surface or underground) was determined by the exploratory holes in this seam.
- the Crow Coal is inferred to outcrop ~30m west of the Geological Survey and Coal Authority conjectural outcrop (Drawing 3959OD04, Appendix 1.1) and is inferred to have a vertical separation of around 10 m below the Thin Coal. The seam was proven to be only intact at one location (0.2 m thick) and elsewhere only voids and broken ground were recorded of between 0.3 m to 0.9 m thick. In the central area of the site, this seam is inferred to outcrop at around 135 m AOD, dipping to the north-eastern corner of the site at an elevation of around 127 m AOD.
- the Black Bed Coal is inferred to outcrop west of the site, as indicated by the Geological Survey and Coal Authority conjectural outcrop (Drawing 3959OD04, Appendix 1.1) and is inferred to have a vertical separation of around 15 m to 20 m below the Crow Coal. The seam was not proven intact in the two locations drilled, where only voids and broken ground were recorded of between 0.3 m to 0.5 m thick. In borehole R5, the drilling records noted a loss of flush returns between a depth of 12.6 m and the void at 18.6 m to 18.9 m bgl, which indicates broken ground and a possible crown hole development within the overlying strata.

At the time of reporting the surveying of surface elevations and coordinates of the exploratory holes had not been completed and the reported estimated elevations detailed above and below will need to be reviewed once this survey data is available. The estimated elevations are based on limited point data across parts of the site.

9.2 Assessment of Mineral Instability

Surface settlement above areas of total coal extraction (goaf) is typically rapid and can generally be assumed to be complete after a certain period. Settlement above pillar and stall workings, or old roadways, can be sudden and abrupt; and can occur long after abandonment, sometimes creating surface features known as crown-holes. It is generally considered that a cover of competent rock strata equivalent to ten times the height of the working provides adequate protection against crown-hole development (Ref. 14). Less rock cover can be adequate in certain circumstances (e.g. if the rock cover is particularly strong). Drift deposits give less protection than competent rock and depending on the nature of the drift material (e.g. whether stiff boulder clay or running sand) considerably more cover may be needed to minimise the risk of surface ground movement. Where mining is identified within seams of less than 1 m thickness, it has been assumed that to accommodate for roadways the minimum worked height will be 1 m, otherwise the working height is assumed to be the seam thickness unless otherwise identified.

Table 6 presents a preliminary assessment of the risk of mineral instability within the development based on the ground conditions determined from the Coal Mining Risk Assessment (Ref. 2) and the results of the ground investigation. This risk assessment is "preliminary" only and will require revision based on a detailed assessment of seam and plot elevations using detailed topographical survey information and additional probe drilling to confirm the geometry of the seams beneath the development.

Table 8 Mineral Instability Risk Assessment

Seam Name	Seam Description	Workings	Assessment of Risk
Thin Seam	This seam is inferred to outcrop northwest to southeast through the eastern side of the development beneath Plots 11, 17, 16, 15, 27, 79, 78, 73 and 72. It has been proven to be at a depth of around 2m at the outcrop in the west and at a depth of around 8m bgl in the northeast and is inferred to dip to the northeast. This seam is expected to be between 0.1 m and 0.4 m thick.	There are no recorded workings in this seam, however, unrecorded workings are reported to be possible (Ref. 2). Although no evidence of workings was proven in this seam by the ground investigation, unrecorded workings of up to 0.5 m thick and 1.0 m thick in roadways are possible.	In view of the potential for unrecorded workings in this seam of between 0.5 m to 1.0 m thick and due to the limited thickness of rock cover (2 m to 5 m) of less than 10 times the potential worked seam thickness, it is considered that there is a moderate mineral instability risk to housing Plots 11 to 17, 27, 69 to 73 and 78 to 80 and the adjacent associated estate roads.

Seam Name	Seam Description	Workings	Assessment of Risk
Crow Coal	This seam is inferred to outcrop northwest to southeast through the central part of the development beneath Plots 5, 4, 2, 33, 34, 38, 46, 45 and 58. It has been proven to be at a depth of around 2 m at the outcrop in the west and at a depth of around 16 m bgl in the northeast and is inferred to dip to the northeast. This seam is expected to be between 0.2 m and 0.5 m thick.	There are no recorded workings in this seam, however, evidence of unrecorded workings as voids and broken ground have been proven by this investigation widespread of between 0.3 m and 0.9 m thick.	In view of the potential for unrecorded workings in this seam across the central and eastern half of the site of between 0.3 m to 1.0 m (in areas of roadways) thick and due to the limited thickness of rock cover (2 m to 14 m), a large proportion of which is less than 10 times the potential worked seam thickness, it is considered that there is a high mineral instability risk to all housing Plots 1 to 30, 33, 34, 38 to 47 and 58 to 80 and the adjacent associated estate roads if the overlying Thin Coal is worked.
Black Bed Coal	The Black Bed Coal is inferred to underlie the whole development area with its outcrop west of the western boundary and dipping to the northeast at around 2°. It is inferred to have a vertical separation of around 15 m to 20 m below the Crow Coal. It is reported to be at a depth of around 15 m bgl at the airshaft adjacent to the western boundary (Ref. 2) and at a depth of around 18 m bgl in RH3 and 5 in the northwest of the site. The seam is reported to be up to 0.5 m thick.	There are both unrecorded and recorded workings in this seam widespread across the whole site. Evidence of workings, as voids and broken ground, have been proven by this investigation in the northwestern of between 0.3 m and 0.5 m thick and are expected to be up to 1.0 m thick in areas of roadways.	Although there is potential for shallow workings in this seam in the western part of the site of between 0.3 m to 1.0 m (in areas of roadways) thick, due to the inferred thickness of rock cover (12 m to 16 m) west of the inferred Crow Coal outcrop, all the plots adjacent to the western boundary are expected to have a rock cover of greater than 10 times the potential worked seam thickness. As such, working in the Black Bed Coal are considered to present a low mineral instability risk to housing Plots 32 - 40 and 49 – 58 and the adjacent associated estate roads. Over the rest of the site as the seam separation between the Crow Coal and the Black Bed Coal is inferred to be 15 m to 20 m (i.e. >10 x worked seam thickness) mineral instability from the Black Bed Coal is also considered to be a low risk over the remainder of the development.
Better Bed Coal Sequence	(up to 1.45 m thick) at depths below 35 m along the western boundary	There are unrecorded and recorded workings in this seam sequence, which may be up to 1.5 m thick.	Due to the presence of over 20 m of rock cover above workings of up to 1.5 m thick, this seam presents a low mineral instability risk to the development.

9.3 Mine Shafts

No evidence of the north-western mine (air) shaft was detected on site by the trial trenching, as shown on Drawing 3959OD06, Appendix 1.1. As such, it is expected to exist off site potentially at a distance of over 5 m, as indicated by the Coal Mining Risk Assessment (Ref. 2). On the basis that rockhead will be at a depth of around 2 to 3 m bgl at the shaft location, and assuming that the shaft could be within 1 m of the boundary, an exclusion zone to built development should be placed 6 m out from the site boundary adjacent to the reported shaft location.

9.4 Recommendations on Remedial Measures for Surface Instability

The risk assessment presented in Section 9.2 is considered "preliminary" only and will require revision based on a detailed assessment of seam and plot elevations using detailed topographical survey information.

Based on this risk assessment, it is recommended that provision is made to undertake the following remedial measures:

- Probe drilling of housing Plots 32 - 40 and 49 – 58 and the adjacent associated estate roads to a depth of 20 m to prove a low mineral instability risk from the Black Bed Coal and confirm that grouting is not required.
- Probe drilling and grouting, if necessary, of Plots 1 to 30, 33, 34, 38 to 47 and 58 to 80, and the adjacent associated estate roads to a depth of between 15 to 20m to prove and remediate the mineral instability risk from the Crow Coal in the west and the Thin Coal and Crow Coal in the east.

10 ENGINEERING ASSESSMENT

10.1 Design Elements and Requirements

The proposed residential development is for a total of 80 No. properties with gardens, associated car parking, roads, two public open spaces and two SUDS basins. The development layout as proposed is shown on the Clients Drawing 3284-0-002 O, Appendix 1.2.

10.2 Geotechnical Considerations for Proposed Development

From the ground conditions determined onsite, the following geotechnical issues have been identified that require consideration in the design of the proposed development: -

- Extent, nature and depth of medium volume change potential superficial soils subject to potential shrinking and swelling.
- Shallow highly weathered mudstone interbedded with sandstone rockhead was proven at depths of between 0.9 m to 3.1 m bgl.
- Perched groundwater exists in isolated pockets within the glacial till, with the main groundwater table expected in the Coal Measures strata at depth.
- Localised instability of excavations should be anticipated where sand lenses are present within the superficial soils and shallow perched groundwaters are present.

- Field boundaries delineated with trees, hedgerows and fences. There are mature trees aligned east to west in the southern third of the site and along the south-western boundary. There is a mature wood bordering the site adjacent to the north-eastern boundary.
- Shallow mine workings and collapsed ground, presenting a risk of mineral instability in the northern, central and southwestern parts of the site, associated with crop workings within the Thin Coal and Crow Coal seams.

10.3 Mining

Grouting has been recommended to the Thin Coal seam in the northeast and Crow Coal seam beneath the northern, central and southwestern parts of the site.

Strip foundations overlying grouted seams should be 300 mm thick and reinforced top and bottom with one layer of B503 fabric mesh. However, where rock cover above a grouted seam is less than five times the seam thickness, edge beam raft foundations designed to span 3 m and cantilever 1.5 m at corners should be used.

10.4 Preliminary Comments on Foundation Design

Founding Strata

Main Development Area

The main development area of the site is underlain by firm and stiff sandy gravelly clay to depths of around 0.9 m to 3.1 m bgl and then weathered very weak mudstone interbedded with sandstone. The firm clay is of medium volume change potential and low to high plasticity, with a minimum design shear strength of 60 kN/m^2 and a coefficient of compressibility of 0.13 m^2/MN.

Surface Water Attenuation Basin and Pumping Station

The southern parts of the site are underlain by firm and stiff sandy gravelly clay to depths of around 1.8 to 1.9 m bgl and then weathered very weak mudstone. The firm clay is of medium volume change potential and low to high plasticity, with a minimum design shear strength of 60 kN/m^2 and a coefficient of compressibility of 0.13 m^2/MN.

Foundation Design

Assuming strip foundations will be used of up to 0.6 m wide and taken below all topsoil, made ground and softened clay to a minimum depth of 0.9 m (in accordance with NHBC guidance for medium volume change potential clays, Ref. 15) below the lower of existing or finished floor levels [bFFL], a minimum allowable bearing capacity of >125 kN/m^2 can be calculated at which settlement for foundations bearing in the firm to stiff clay will be expected to be less than 25 mm.

If the founding stratum is found to be variable, and particularly if it is found to consist both of clay and sand or weathered bedrock, the foundations should be either reinforced to limit differential settlement or extended so that the whole of the foundation is bearing onto one strata.

Tree Influence

Field boundaries delineated with trees, hedgerows and fences. There are mature trees aligned east to west in the southern third of the site and along the south-western boundary. There is a mature wood bordering the site adjacent to the north-eastern boundary.

These trees could impact on soil moisture conditions within the clays beneath the site. Therefore, if normal shallow foundations are to be adopted or ground bearing floor slabs, it is recommended that during the detailed design stage that where trees are to be retained, removed or new planting is to be undertaken in close proximity to proposed building foundation, final foundations depths are designed in accordance with NHBC guidance (Ref. 15). Where existing trees are to be felled, it is recommended that a tree survey be undertaken prior to felling.

Floor Slabs

In accordance with NHBC guidelines, suspended floor slabs should be adopted where made ground exceeds 0.6 m in thickness. Therefore, on this site it should be possible to adopt ground bearing floor slabs.

Where significantly desiccated soil is present, or where foundation depths are to be increased to more than 1.5 m bgl due to the presence of trees, a suspended ground floor slab construction should be adopted. The suspended slab should have a minimum void height in accordance with NHBC Standards Chapter 4.2 (Ref. 15).

General Comments

It should be recognised that clay rich soils can deteriorate fairly rapidly on exposure, particularly in periods of wet weather and frost. It would be prudent to protect all exposed soils in foundation excavations with a concrete blinding layer, particularly if they are likely to remain open for extended period of time.

If the founding stratum is found to be variable, and particularly if it is found to consist both of clay and sand, the foundations should be reinforced to limit differential settlement.

Excavation sides should be designed, constructed, and supported in accordance with the recommendations given in CIRIA Report No. 97 and consideration of potential running sand conditions (particularly given the localised, discontinuous sand lenses present across the site and the laminated clays at depth) will be necessary. In order to minimise disturbance of the base of foundation excavations in sand, the excavator should be fitted with a machine bucket without teeth.

Instability of excavations should be anticipated where localised sand strata and groundwaters are present. Care must be taken during any excavation and/or dewatering, to prevent any migration of fines, which could cause subsequent local settlements.

Although, perched groundwater exists in isolated pockets within the glacial till, with the main groundwater table expected in the Coal Measures strata at depth, the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities. Therefore, water levels different than those found during this investigation may be encountered.

10.5 Pavement Design for Car Parking and Roadways

The predominant subgrade of the car parks and roadways will be firm Glacial Till and based on the shear strength and plasticity of these materials, a CBR design value of up to 3% can be adopted where suitably proof rolled (Ref. 16).

10.6 Infiltration Drainage

In view of the cohesive nature of the glacial soils present across the whole site area, infiltration drainage is unlikely to be viable.

10.7 Chemical Attack on Buried Concrete

Based on sulphate results from the current investigation in accordance with Ref. 13, in-ground concrete should be designed for Sulphate Class DS-1, ACEC Class AC-1 for future structures on this site.

A ROBINSON
PRINCIPAL CONSULTANT

M LAKEY
DIRECTOR

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16 Highways Agency, 1994. HD 25/94, Pavement Design and Maintenance, Vol. 7, Section 2, Part 2.

APPENDIX 1

DRAWINGS

APPENDIX 1.1

FWS DRAWINGS

NOTES / KEY

SITE LOCATION

DRAWING TITLE

SITE LOCATION PLAN

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JG	March 2022
SCALE	DRG. No.
AS SHOWN	3959OD01

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NOTES / KEY

SITE BOUNDARY

FIELDS

HEDGEROW AND SMALL TREES

DIRECTION OF SLOPE

DRAWING TITLE

SITE LAYOUT PLAN

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JFT	March 2022
SCALE	DRG. No.
AS SHOWN	3959OD02

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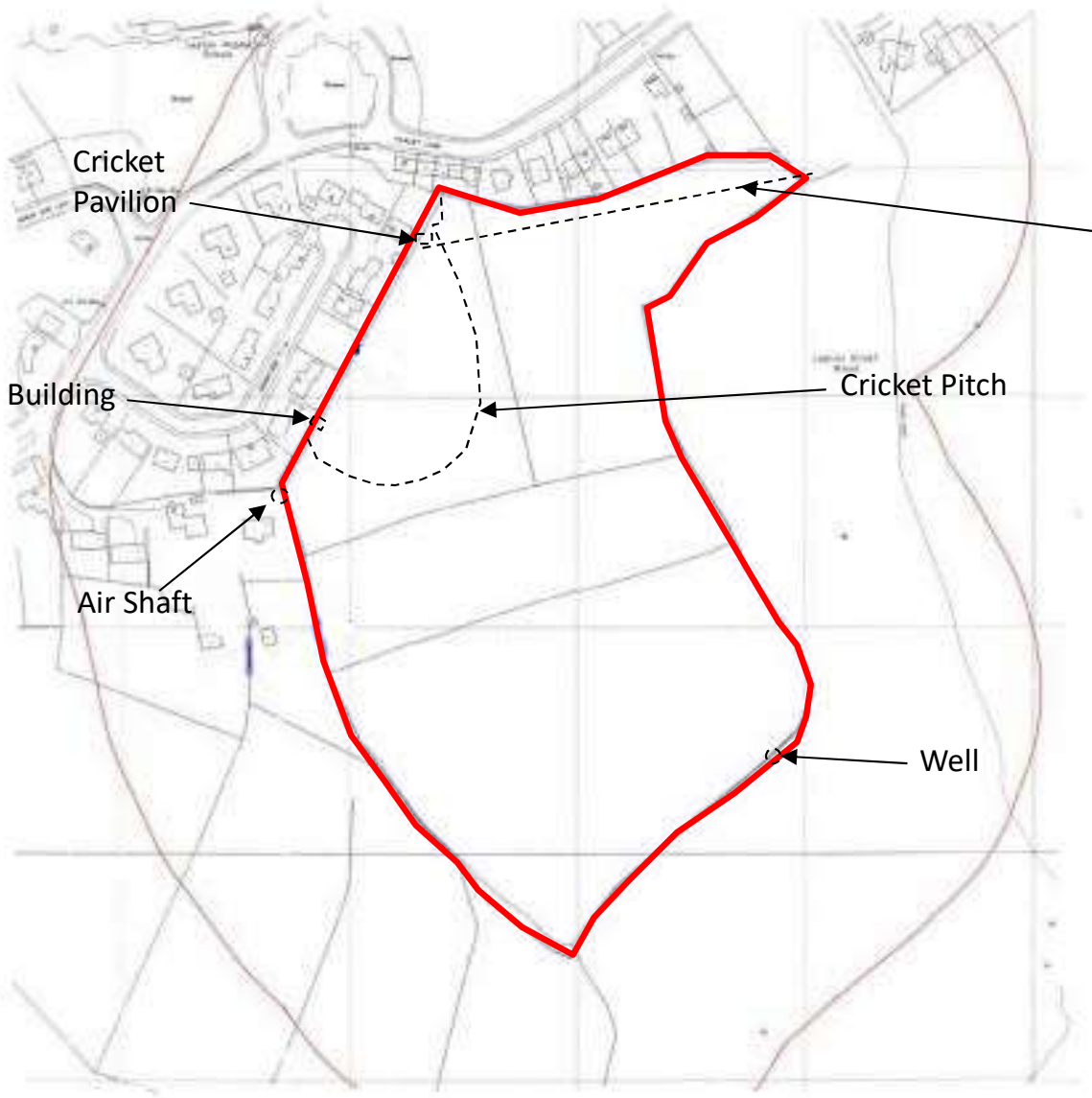

NOTES / KEY

SITE BOUNDARY

LOCATION OF HISTORICAL FEATURE

DRAWING TITLE

HISTORICAL LAYOUT PLAN

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JFT	March 2022
SCALE	DRG. No.
AS SHOWN	3959OD03

FWS Geotechnical & Environmental Consultants

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St Johns Road
Meadowfield Ind. Est.
Durham
DH7 8ER

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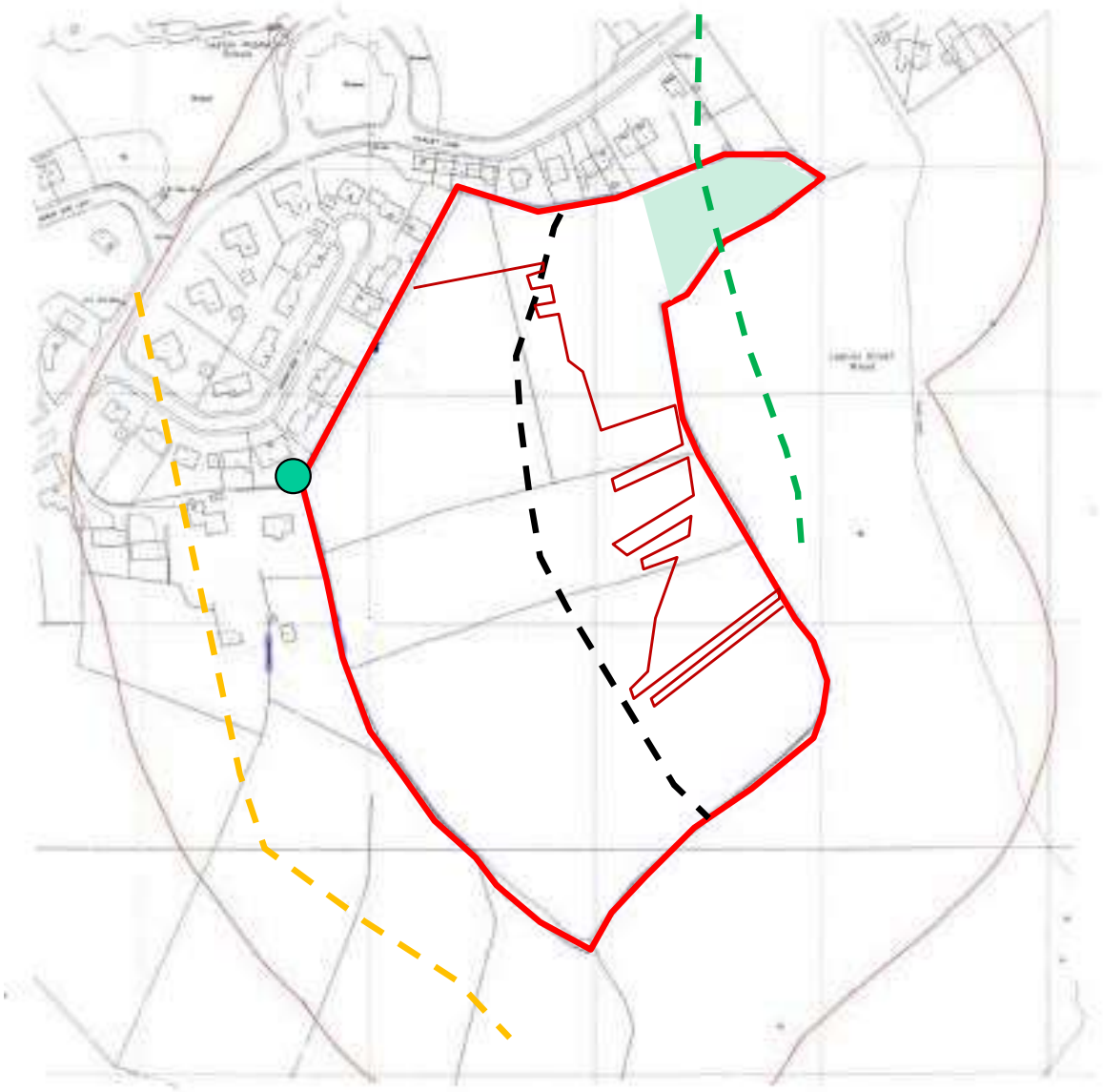
admin@fwsconsultants.com www.fwsconsultants.com



N

100 m

NOTES / KEY

SITE BOUNDARY

AIRSHAFT

BLACK BED COAL OUTCROP

THIN COAL OUTCROP

CROW COAL OUTCROP

OPENCAST WORKINGS

RECORDED COAL WORKINGS

DRAWING TITLE

COAL OUTCROPS AND RECORDED WORKINGS

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JFT	March 2022
SCALE	DRG. No.
AS SHOWN	3959OD04

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NOTES / KEY

SITE LOCATION

ROTARY BOREHOLES

TRIAL PITS

WINDOW SAMPLE BOREHOLES

AIR SHAFT TRIAL TRENCHING

DRAWING TITLE

EXPLORATORY HOLE LOCATION PLAN

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS DEVELOPMENT LTD

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JG	March 2022
SCALE	DRG. No.
NOT TO SCALE	3959OD05

FWS Environmental & Geological Consultants

Merrington House
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Co Durham
DL16 7UT

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Denotes area of excavation, topsoil was removed until natural subsoil was excavated.

No evidence of made ground or relic structures associated with the former Air Shaft were observed onsite.

Localised made ground was recorded above the linear feature of a field drain.

NOTES / KEY

SITE LOCATION

ROTARY BOREHOLES

TRIAL PITS

WINDOW SAMPLE BOREHOLES

AIR SHAFT TRIAL TRENCHING

DRAWING TITLE

RECORD OF TRIAL TRENCHING INVESTIGATION FOR THE AIR SHAFT

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
KW	March 2022
SCALE	DRG. No.
NOT TO SCALE	3959OD06

FWS Environmental & Geological Consultants

Merrington House
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Spennymoor
Co Durham
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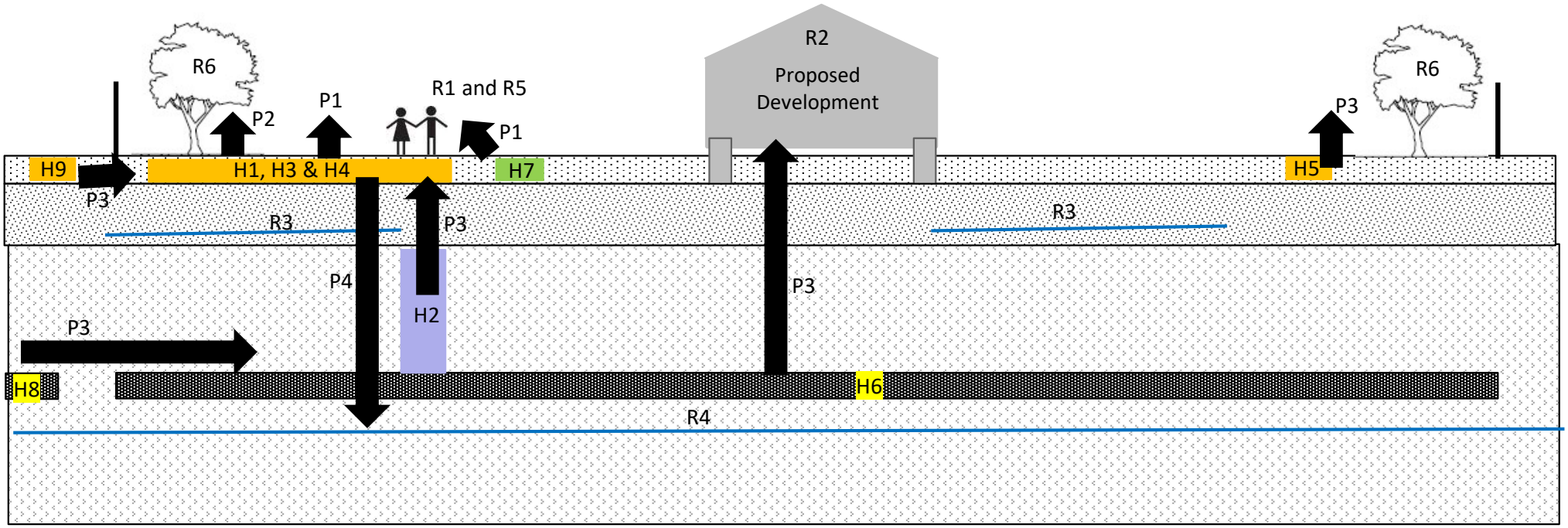
NORTHERN BOUNDARY

SOUTHERN BOUNDARY



NOTES / KEY

- TOPSOIL
- SUPERFICIAL DEPOSITS
- BEDROCK (PENNINE LOWER COAL MEASURES)
- COAL WORKINGS

DRAWING TITLE

CONCEPTUAL SITE MODEL AND PRELIMINARY RISK ASSESSMENT

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS Development Ltd

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
JFT	March 2022
SCALE	DRG. No.
NOT TO SCALE	3959OD07

FWS Geotechnical & Environmental Consultants

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County Durham
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NOTES / KEY

Investigation Location

DRAWING TITLE

EXPLORATORY HOLE LOCATION PLAN

PROJECT TITLE

ROWLEY LANE, LEPTON

CLIENT

KCS DEVELOPMENT LTD

STATUS	PROJECT NUMBER
FINAL	3959
DRAWN BY	DATE
AR	NOVEMBER 2023
SCALE	DRG. No.
AS SHOWN	39590OD08

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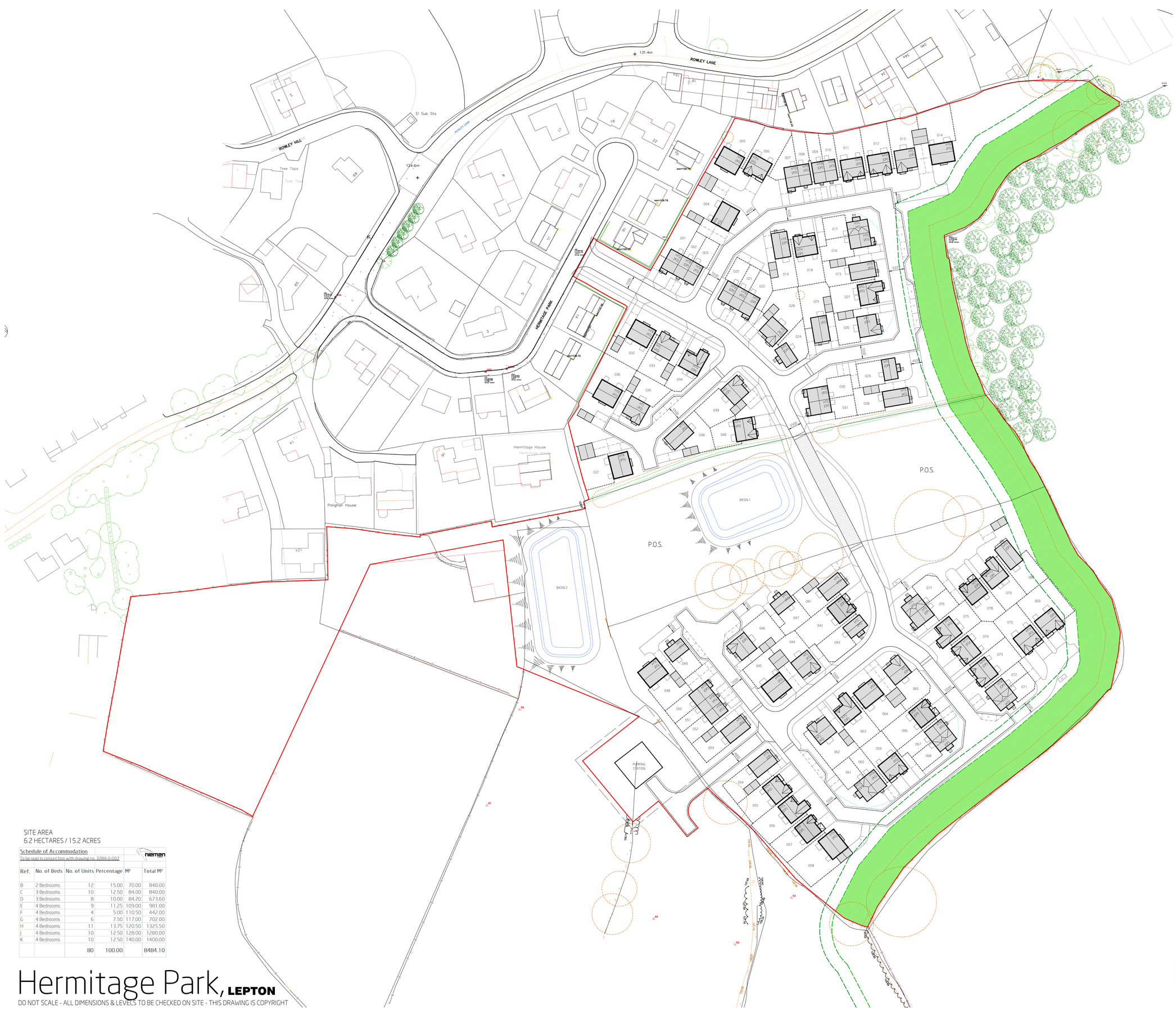
APPENDIX 1.2

THIRD PARTY DRAWINGS



N

S

KEY:

- ANCIENT WOODLAND 15m OFFSET TO ROADS / PATHS
- ANCIENT WOODLAND 20m OFFSET TO BUILDINGS
- ANCIENT WOODLAND SEMI NATURAL BUFFER
- ROOT PROTECTION ZONE
- FORWARD VISIBILITY SPLAYS

SITE AREA
6.2 HECTARES / 15.2 ACRES

Schedule of Accommodation

To be read in conjunction with drawing no. 3284-0-002

Ref.	No. of Beds	No. of Units	Percentage	M²	Total M²
B	2 Bedrooms	12	15.00	70.00	840.00
C	3 Bedrooms	10	12.50	84.00	840.00
D	3 Bedrooms	8	10.00	84.20	673.60
E	4 Bedrooms	9	11.25	109.00	981.00
F	4 Bedrooms	4	5.00	110.50	442.00
G	4 Bedrooms	6	7.50	117.00	702.00
H	4 Bedrooms	11	13.75	120.50	1325.50
J	4 Bedrooms	10	12.50	128.00	1280.00
K	4 Bedrooms	10	12.50	140.00	1400.00
		80	100.00		8484.10

Hermitage Park, LEPTON

DO NOT SCALE - ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE - THIS DRAWING IS COPYRIGHT

SKETCH
subject to structural review
subject to accurate measured survey

revision	date	content	initials
O	06.04.22	RED LINE BOUNDARY REVISED AS PART OF BNG QUALIFICATION	ED
N	24.03.22	LAYOUT ADJUSTED IN LINE WITH ENGINEERS ADJUSTMENTS AND ARCHITECTS ADJUSTMENTS.	JB
M	22.02.22	HT DRAWINGS REVISED TO SHOW PATIOS TO REAR DOORS	ED
L	22.09.21	GARAGES TO PLOTS 41&54 REMOVED FROM RPA	ED
K	13.09.21	KERB RADII TO HERMITAGE RD REVISED TO TIE INTO EXISTING KERBLINE	ED
J	08.09.21	VIS SPLAY TO PLOTS 26 & 17 REVISED.	ED
I	06.09.21	CENTRELINE RADIUS ADJ PLOT 43. VISIBILITY SPLAYS INCORPORATED WITHIN PROPOSED ADOPTED HIGHWAY LIMIT	ED
H	31.08.21	LAYOUT REVISED IN LINE WITH HIGHWAYS ENGINEERS COMMENTS	ED
G	10.08.21	REVISED SITE LAYOUT	SM
F	02.11.20	ROOT PROTECTION ZONES ADDED AND SITE LAYOUT UPDATED TO SUIT	SN
E	23.10.20	TURNING HEADS IN FRONT OF PLOTS 58-61 & 70-72 UPDATED	SN
D	20.10.20	ANCIENT WOODLAND BUFFER, SUDS BASINS & PUMPING STATION ADDED, SITE LAYOUT AMENDED TO SUIT	SN
C	15.07.20	HIGHWAY UPDATES	SN
B	10.07.20	APARTMENTS ADDED & SITE UPDATED TO SUIT	SN
A	19.06.20	SHARED SURFACES UPDATED	SN

project: PROPOSED RESIDENTIAL HERMITAGE PARK LEPTON, HUDDERSFIELD

client: KCS DEVELOPMENTS

title: PROPOSED SITE LAYOUT

date: 17.06.20 | scale: 1:500 @ A0 | drawn: SN

drawing number: 3284-0-002 O | checked:

niemen architects
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APPENDIX 2

EXPLORATORY HOLE LOGS

APPENDIX 2.1

ROTARY OPENHOLE BOREHOLE LOGS

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22 22-02-22	143.28	E 419,341.2 N 414,770.1	
Contractor				Sheet
ID Drilling Ltd				1 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			143.08		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(2.10)			Firm light brown with grey mottling very sandy CLAY.		
			140.98		2.30					
					(1.10)			Weak distinctly weathered grey MUDSTONE.		
			139.88		3.40					
					(0.50)			Light brown and grey sandy MUDSTONE.		
			139.38		3.90					
					(1.90)			Light brown medium argillaceous SANDSTONE.		
			137.48		5.80					
					(1.60)			Light brown and grey sandy MUDSTONE.		
			135.88		7.40					
			135.58		7.70			Black COAL.		
								Light brown and grey sandy MUDSTONE.		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Hand dug pit to 1.2 m. Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22 22-02-22	143.28	E 419,341.2 N 414,770.1	
Contractor				Sheet
ID Drilling Ltd				2 of 3

RUN DETAILS			STRATA							
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
								Light brown and grey sandy MUDSTONE. *(continued)*		
					(8.30)					
			127.28		16.00					

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH1
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22 22-02-22	143.28	E 419,341.2 N 414,770.1	
Contractor				Sheet
ID Drilling Ltd				3 of 3

RUN DETAILS			STRATA							
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
					(0.50)			Void - Total loss of flush.		
			126.78		16.50			End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22 23-02-22	138.52	E 419,288.7 N 414,737.0	
Contractor				Sheet
ID Drilling Ltd				1 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			138.32		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(2.40)			Firm light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular sandstone.		
			135.92		2.60					
					(3.50)			Light brown fine to medium argillaceous SANDSTONE.		
			132.42		6.10					
					(2.20)			Light brown and grey sandy MUDSTONE.		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Hand dug pit to 1.2 m. Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH2
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22 23-02-22	138.52	E 419,288.7 N 414,737.0	
Contractor				Sheet
ID Drilling Ltd				2 of 2

RUN DETAILS			STRATA							
Depth Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			130.22		8.30					
					(0.90)			VOID - Total loss of flush.		
			129.32		9.20			End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	135.10	E 419,225.1 N 414,716.9	
Contractor				Sheet
ID Drilling Ltd				1 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			134.90		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(1.50)			Firm to stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone coal and mudstone.		
			133.40		1.70					
					(0.60)			Weak distinctly weathered grey MUDSTONE.		
			132.80		2.30					
			132.60		2.50			Black COAL.		
								Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH3
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	135.10	E 419,225.1 N 414,716.9	
Contractor				Sheet
ID Drilling Ltd				2 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
					(15.70)			Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE. *(continued)*		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				**RBH3**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	135.10	E 419,225.1 N 414,716.9	
Contractor				Sheet
ID Drilling Ltd				3 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	DESCRIPTION: Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
								Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE. *(continued)*		
			116.90		18.20					
					(0.50)			VOID - total loss of flush.		
			116.40		18.70					
								End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	02-03-22	138.14	E 419,303.6 N 414,682.7	
Contractor				Sheet
ID Drilling Ltd				1 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			137.94		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(1.60)			Light brown very clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular of sandstone.		
			136.34		1.80					
					(7.10)			Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH4
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	02-03-22	138.14	E 419,303.6 N 414,682.7	
Contractor				Sheet
ID Drilling Ltd				2 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
								Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE. *(continued)*		
			129.24		8.90					
								VOID - total loss of flush.		
			128.94		9.20					
								End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	134.33	E 419,210.3 N 414,662.4	
Contractor				Sheet
ID Drilling Ltd				1 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			134.13		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(2.10)			Firm brown sandy CLAY.		
			132.03		2.30					
					(4.10)			Light greyish brown fine to medium argillaceous SANDSTONE.		
			127.93		6.40					
								Light brown and grey sandy MUDSTONE.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	134.33	E 419,210.3 N 414,662.4	
Contractor				Sheet
ID Drilling Ltd				2 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
								Light brown and grey sandy MUDSTONE. *(continued)*		
					(12.20)		12.60 - 18.60 Partial loss of flush.			

Drilling Progress and Water Observations

Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush

From	To	Type	Returns
12.6	18.6		70

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH5
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	134.33	E 419,210.3 N 414,662.4	
Contractor				Sheet
ID Drilling Ltd				3 of 3

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	DESCRIPTION: Detail	DESCRIPTION: Main	Geology	Instrument/ Backfill
								Light brown and grey sandy MUDSTONE. *(continued)*		
			115.73		18.60					
			115.43		18.90			VOID - total loss of flush.		
								End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	138.47	E 419,327.1 N 414,629.2	
Contractor				Sheet
ID Drilling Ltd				1 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			138.27		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(1.40)			Firm light brown and orange sandy CLAY.		
			136.87		1.60					
					(7.50)			Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH6
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	138.47	E 419,327.1 N 414,629.2	
Contractor				Sheet
ID Drilling Ltd				2 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
								Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE. *(continued)*		
			129.37		9.10					
			129.07		9.40			VOID - total loss of flush.		
								End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	28-02-22	138.57	E 419,355.1 N 414,566.5	
Contractor				Sheet
ID Drilling Ltd				1 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			138.37		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(1.60)			Firm light brown and orange sandy CLAY.		
			136.77		1.80					
					(8.30)			Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH7
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	28-02-22	138.57	E 419,355.1 N 414,566.5	
Contractor				Sheet
ID Drilling Ltd				2 of 2

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION: Discontinuities	Detail	Main	Geology	Instrument/ Backfill
								Interbedded grey and light brown sandy MUDSTONE and light brown argillaceous fine to medium SANDSTONE. *(continued)*		
			128.47		10.10					
			128.07		(0.40) 10.50			VOID - total loss of flush.		
								End of borehole.		

Drilling Progress and Water Observations						
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing

Rotary Flush			
From	To	Type	Returns

GENERAL REMARKS

Hand dug pit to 1.2 m.
Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

DRILLHOLE LOG

Project				DRILLHOLE No
Rowley Lane, Lepton				RBH8
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	25-02-22	134.46	E 419,261.3 N 414,535.2	
Contractor				Sheet
ID Drilling Ltd				1 of 1

RUN DETAILS			STRATA							
Depth / Date	TCR (SCR) RQD	Fracture Index (FI) / SPT (N)	Red'cd Level	Legend	Depth (Thick-ness)	DESCRIPTION Discontinuities	Detail	Main	Geology	Instrument/ Backfill
			134.26		0.20			Dark brown sandy clayey TOPSOIL with rootlets.		
					(1.60)			Firm light brown and orange sandy CLAY.		
			132.66		1.80					
					(3.10)			Light greyish brown fine to medium argillaceous SANDSTONE.		
			129.56		4.90					
			129.16		(0.40) 5.30			VOID - total loss of flush.		
								End of borehole.		

Drilling Progress and Water Observations							Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing	Core Dia mm	Water Strike	Water Standing	From	To	Type	Returns	Hand dug pit to 1.2 m. Water flush throughout.

All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used MI3 Rotary Rig	Logged By JG

AGS3 UK DH NEW RH LOGS.GPJ AGS3_ALL.GDT 07/11/23

APPENDIX 2.2

MINI-RIG LOGS

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS01**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	139.89	E 419,315.7 N 414,736.5	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				139.79		0.10	Dark brown sandy clayey TOPSOIL with rootlets.		
							Firm grey with orangish brown mottlings sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.		
0.50	E								
						(1.80)			
1.20	SPT	N11							
1.50	D								
				137.99		1.90			
2.00	SPT	N14					Weathered MUDSTONE bedrock recovered and sandy gravelly CLAY. Gravel is fine to medium subangular of mudstone.		
						(1.10)			
				136.89		3.00			
3.00	SPT	N50/ 0.22					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS02**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-23	136.66	E 419,240.3 N 414,745.3	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				136.46		0.20	Dark brown sandy clayey TOPSOIL with rootlets.		
							Firm to stiff brown sandy slightly gravelly CLAY. Gravel is fine to medium subangular of sandstone mudstone and coal.		
1.20 1.30	SPT E	N14				(2.10)			
2.00	SPT	N20		134.36		2.30			
2.40	E					(0.50)	Light brown clayey fine to medium SAND.		
				133.86		2.80			
				133.66		3.00	Grey and light brown highly weathered weak thinly bedded MUDSTONE.		
3.00	SPT	N50/ 0.2					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS03**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	137.28	E 419,272.7 N 414,709.4	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				137.18		0.10	Dark brown sandy clayey TOPSOIL with rootlets.		
							Firm brown with grey mottling sandy slightly gravelly CLAY. Gravel is fine to medium subangular of mudstone and coal.		
						(1.80)			
1.20	SPT	N14							
				135.38		1.90			
				135.28		2.00	Grey and light brown highly weathered weak thinly bedded MUDSTONE.		
2.00	SPT	N50/ 0.235					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	135.66	E 419,244.6 N 414,665.7	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E			135.36		(0.30) 0.30	Dark brown sandy slightly gravelly clayey TOPSOIL with rootlets.		
0.50	E					(1.10)	Firm grey with orangish brown mottling sandy CLAY.		
1.20	SPT	N16		134.26		1.40			
1.25	D						Stiff grey and brown sandy gravelly CLAY. Gravel is fine to coarse subangular of mudstone and coal.		
1.70	D					(0.60)			
1.80	E			133.66		2.00			
2.00	SPT	N21				(0.70)	Weak grey weathered thinly bedded MUDSTONE.		
				132.96		2.70			
							End of borehole.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS05
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	138.17	E 419,295.8 N 414,704.4	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				137.87		(0.30) 0.30	Dark brown sandy clayey TOPSOIL with rootlets.		
0.50	E			136.97		(0.90) 1.20	Firm grey with orangish brown mottling sandy CLAY.		
1.20	SPT	N12					Stiff grey and brown sandy gravelly CLAY. Gravel is fine to coarse subangular of coal and mudstone.		
1.25	D								
1.30	E								
2.00	SPT	N17		135.87		(1.10) 2.30			
2.10	D								
				135.17		(0.70) 3.00	Weathered MUDSTONE recovered as clayey gravelly fine to coarse SAND. Gravel fine to coarse subangular of mudstone.		
3.00	SPT	N50/ 0.155 No recovery					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. Topsoil inundated.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS06
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	140.12	E 419,349.3 N 414,622.2	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10	E			139.92		0.20	Dark brown sandy slightly gravelly clayey TOPSOIL with rootlets.		
0.50	E					(1.20)	Firm grey and orangish brown sandy CLAY.		
1.20	SPT	N14		138.72		1.40			
1.80	D			138.12		(0.60) 2.00	Stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of mudstone.		
2.00	SPT	N21		137.32		(0.80) 2.80	Weathered MUDSTONE recovered as stiff grey very sandy laminated CLAY.		
				137.22		2.90	Weathered COAL recovered as clayey fine SAND.		
				137.12		3.00	Weathered MUDSTONE recovered as stiff grey very sandy laminated CLAY.		
3.00	SPT	N50/ 0.145					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS07**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	23-02-22	132.44	E 419,211.2 N 414,572.8	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				132.24		0.20	Dark brown sandy slightly gravelly clayey TOPSOIL with rootlets.		
0.50	E			131.44		(0.80) 1.00	Light brown very sandy CLAY.		
1.20	SPT	N21					Light brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular of sandstone and mudstone.		
1.30	D					(1.20)			
2.00	SPT	N44		130.24		2.20			
2.30	D						Weathered MUDSTONE recovered as greyish brown very clayey fine to coarse SAND. Gravel is fine to coarse subangular of mudstone.		
				129.44		(0.80) 3.00			
3.00	SPT	N50/ 0.13					End of borehole.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS08**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	136.96	E 419,332.0 N 414,545.3	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
				136.66		(0.30) 0.30	Dark brown clayey sandy TOPSOIL with rootlets.		
1.20 1.25	SPT E	N15				(1.80)	Firm grey and orangish brown sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone mudstone and coal.		
2.00	SPT	N27		134.86		2.10			
				134.46		(0.40) 2.50	MUDSTONE recovered as clayey gravelly fine to coarse sand. Gravel is fine to coarse subangular mudstone.		
				134.36		2.60	COAL recovered as clayey fine sand.		
				134.06		(0.30) 2.90	MUDSTONE recovered as clayey gravelly fine to coarse sand. Gravel is fine to coarse subangular mudstone.		
2.90	SPT	N50/ 0.165					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS09**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	139.16	E 419,369.9 N 414,558.5	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10	E			139.01		0.15	Dark brown sandy clay TOPSOIL.		
0.50	E					(1.15)	Firm grey and orangish brown sandy CLAY.		
1.20	SPT	N14		137.86		1.30			
1.80	D					(0.70)	Stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of mudstone.		
2.00	SPT	N27		137.16		2.00			
				136.76		(0.40) 2.40	Weathered COAL recovered as clayey fine sand.		
				136.16		(0.60) 3.00	Weathered MUDSTONE recovered as clayey fine to medium SAND.		
3.00	SPT	No Recovery					End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	24-02-22	133.00	E 419,288.6 N 414,484.1	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10	E			132.80		0.20	Dark brown clayey sandy TOPSOIL with rootlets.		
0.50	E						Light brown very sandy gravelly CLAY. Gravel is fine to coarse subangular sandstone.		
0.70	D								
						(1.65)			
1.20	SPT	N14							
1.80	D			131.15		1.85			
1.90	SPT	N50/ 0.07 No recovery		131.10		1.90	Light brown medium strong part weathered SANDSTONE.		
							End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No visual or olfactory signs of contamination. No groundwater encountered.

All dimensions in metres Scale 1:31.25	Client KDC Development Ltd	Method/ Plant Used Mini Rig	Logged By JG

AGS3 UK BH NEW WS LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS01-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,342.0 N 414,764.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						0.15	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
						(0.35)	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
						0.50	Very weak thinly bedded brown MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
						(2.30)	1.60 Becomes blackish brown. Recovered as slightly sandy very gravelly CLAY.		
						2.80	End of borehole due to refusal.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS02-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,236.0 N 414,747.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						(0.30) 0.30	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
						(1.80) 2.10	Stiff orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
						(0.70) 2.80	Very weak thinly bedded grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of of mudstone.		
						2.90	Black dull COAL. Recovered as fine to medium angular to subangular GRAVEL.		
						3.00	Very weak thinly bedded grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
							End of borehole at scheduled depth.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS04-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,234.0 N 414,664.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						(0.30) 0.30	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
						(1.70) 2.00	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
						2.10	Weak thinly bedded grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
							End of borehole due to refusal.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30)	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.		
						0.30	End of hand dug pit.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:3.125	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04B**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30)	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.		
						0.30	End of hand dug pit.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:3.125	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04C**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						(0.10) 0.10	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.		
0.20	E					(0.20) 0.30	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
							End of hand dug pit.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:3.125	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04D**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30)	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.		
						0.30	End of hand dug pit.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:3.125	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				**WS04E**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30)	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.		
						0.30	End of hand dug pit.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:3.125	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS06-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,360.0 N 414,619.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						0.20	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
						(2.30)	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. 2.00 Becomes laminated.		
						2.50			
						(0.50)	Very weak thinly bedded blackish grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
						3.00	End of borehole at scheduled depth.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS10-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,286.0 N 414,480.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
						0.20	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
						(1.10)	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
						1.30			
						(0.60)	Medium strong brown fine to medium SANDSTONE. Moderately weathered. Recovered as sandy fine to coarse angular to subangular GRAVEL of sandstone.		
						1.90			
							End of borehole at scheduled depth.		

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS11-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,169.0 N 414,613.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30) 0.30	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
0.50	E					(1.50)	Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
0.90	D								
1.20-1.65	SPT	N11					1.50 Becomes stiff.		
1.90	D					1.80			
2.00-2.26	SPT	N50/ 0.11				(0.46) 2.26	Weak thinly bedded blackish grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular. 2.00 Becomes brown.		
							End of borehole due to SPT refusal.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS12-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,176.0 N 414,576.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30) 0.30	Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone and mudstone with occasional rootlets.		
0.50	E						Firm orangish brown with grey mottling sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
0.90	D								
1.20-1.65	SPT	N12				(1.60)	1.20 Becomes stiff.		
						1.90			
2.00-2.45	SPT	N44					Weak thinly bedded blackish grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
2.10	D					(0.74)			
2.45-2.64	SPT	N50/ 0.04							
						2.64			
							End of borehole due to SPT refusal.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

BOREHOLE LOG

Project				BOREHOLE No
Rowley Lane, Lepton				WS13-2023
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,211.0 N 414,521.0	
Contractor				Sheet
GeoSpek				1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30) 0.30	MADE GROUND: Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to coarse angular to subangular of sandstone mudstone and rare ceramics with occasional rootlets.		
0.50	E						Firm orangish brown with grey mottling very sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
0.90	D						0.90 Becomes laminated.		
1.20-1.65	SPT	N12	1			(1.60)	1.20 Becomes stiff. 1.20 - 1.40 Becomes very gravelly.		
						1.90			
2.00-2.45	SPT	N30					Very weak thinly bedded blackish grey MUDSTONE. Distinctly weathered. Recovered as very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular.		
2.60	D						2.30 - 3.60 Becomes brown.		
3.00-3.45	SPT	N49				(2.42)	3.00 Becoming weak.		
4.00-4.32	SPT	N50/ 0.17				4.32			
							End of borehole due to SPT refusal.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hand dug pit to 1.2 m. Groundwater encountered at 1.3 m. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:28.75	Client KDC Development Ltd	Method/ Plant Used Mini rig.	Logged By JR

AGS3 UK BH NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

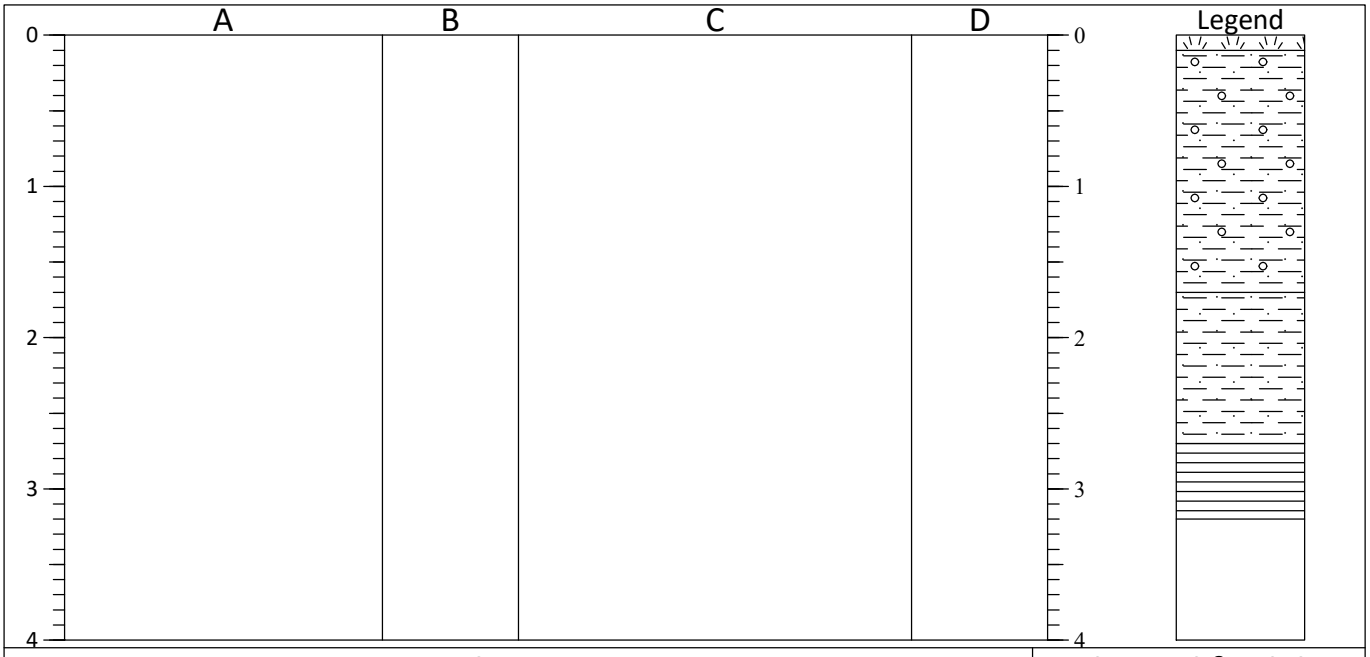
APPENDIX 2.3

TRIAL PIT LOGS

FWS Environmental & Geological Consultants

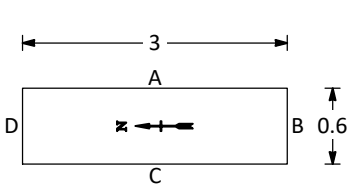
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP01
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22	137.62	E 419,254.8 N 414,764.8	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Dark brown sandy clayey TOPSOIL with rootlets.			
0.10-1.70		Firm light brown and grey sandy gravelly CLAY. Gravel is fine to coarse subangular sandstone. Low cobble content subangular of sandstone.	0.10	E	
			0.70	E	
			1.00	D	
1.70-2.70		Firm light brown with grey mottling very sandy CLAY.	1.80	E	
			2.00	D	
2.70-3.20		Weathered MUDSTONE bedrock recovered as grey gravelly fine to coarse sand. Gravel fine to coarse subangular of mudstone.	2.80	D	
3.20		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

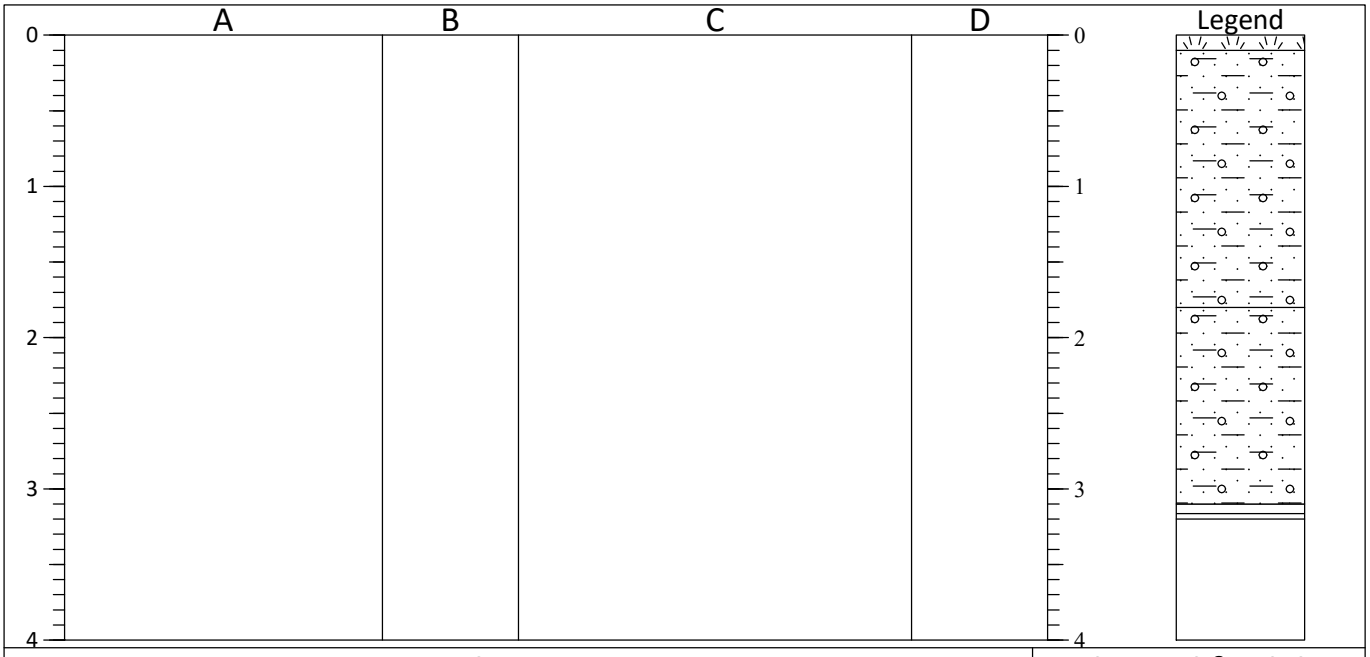
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

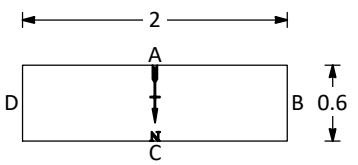
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP02
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22	140.85	E 419,315.9 N 414,777.3	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Dark brown sandy clayey TOPSOIL with rootlets.	0.10	E	
0.10-1.80		Very light brown and grey very clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular sandstone. Low cobble content subangular of sandstone.	0.30	E	
			0.90	D	
1.80-3.10		Weathered mudstone bedrock recovered as slightly clayey fine to coarse gravelly SAND. Gravel is fine to coarse subangular mudstone.	1.90	E	
3.10-3.20		Weak weathered thinly bedded grey MUDSTONE.			
3.20		End of trial pit			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. Groundwater encountered at 3.0 m as slow seepage from east of pit.

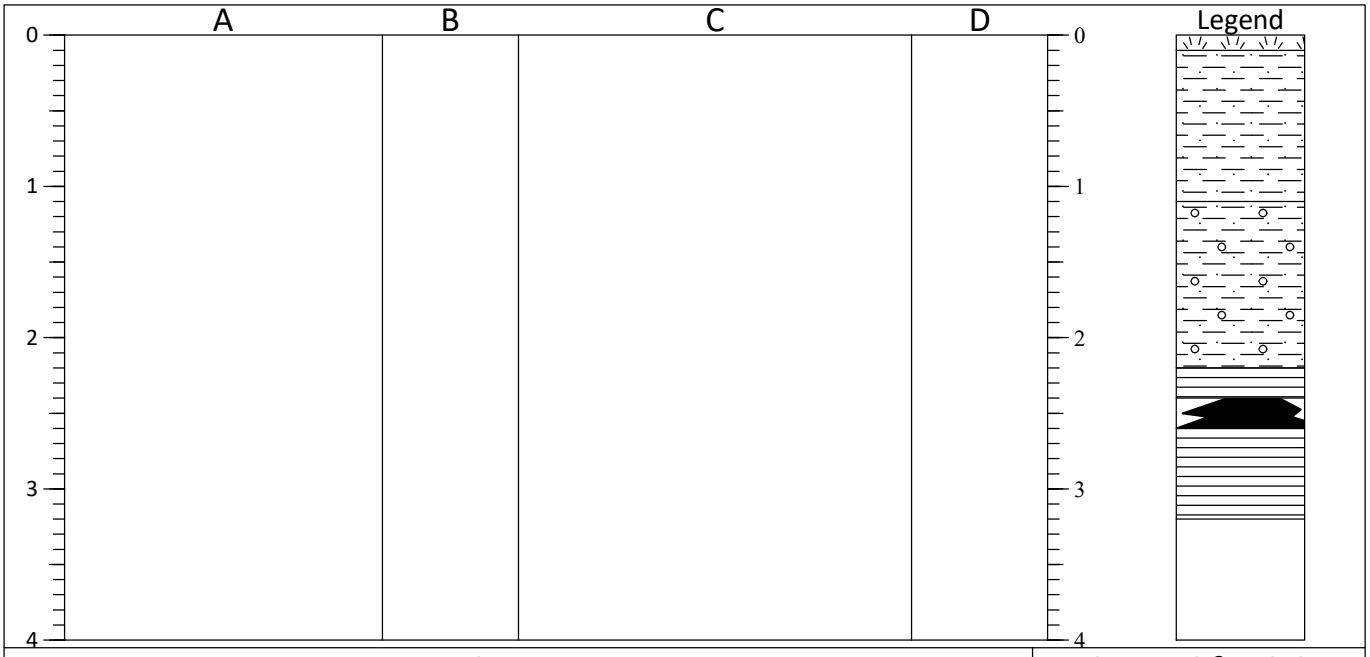
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

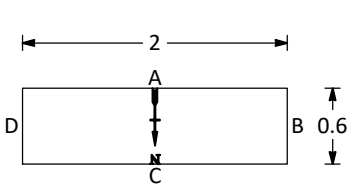
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP03
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22	146.07	E 419,370.1 N 414,790.7	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Dark brown sandy clayey TOPSOIL with rootlets.	0.05	E	
0.10-1.10		Firm light brown with grey mottling very sandy CLAY.	0.70	E	
			0.90	D	
1.10-2.20		Firm to stiff grey with brown mottling sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of mudstone.	1.70	E	
			2.00	D	
2.20-2.40		Weak weathered dark grey thinly bedded MUDSTONE.			
2.40-2.60		Weathered COAL recovered as clayey sandy fine to coarse subangular gravel.			
2.60-3.20		Weak weathered dark grey thinly bedded MUDSTONE.			
3.20		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

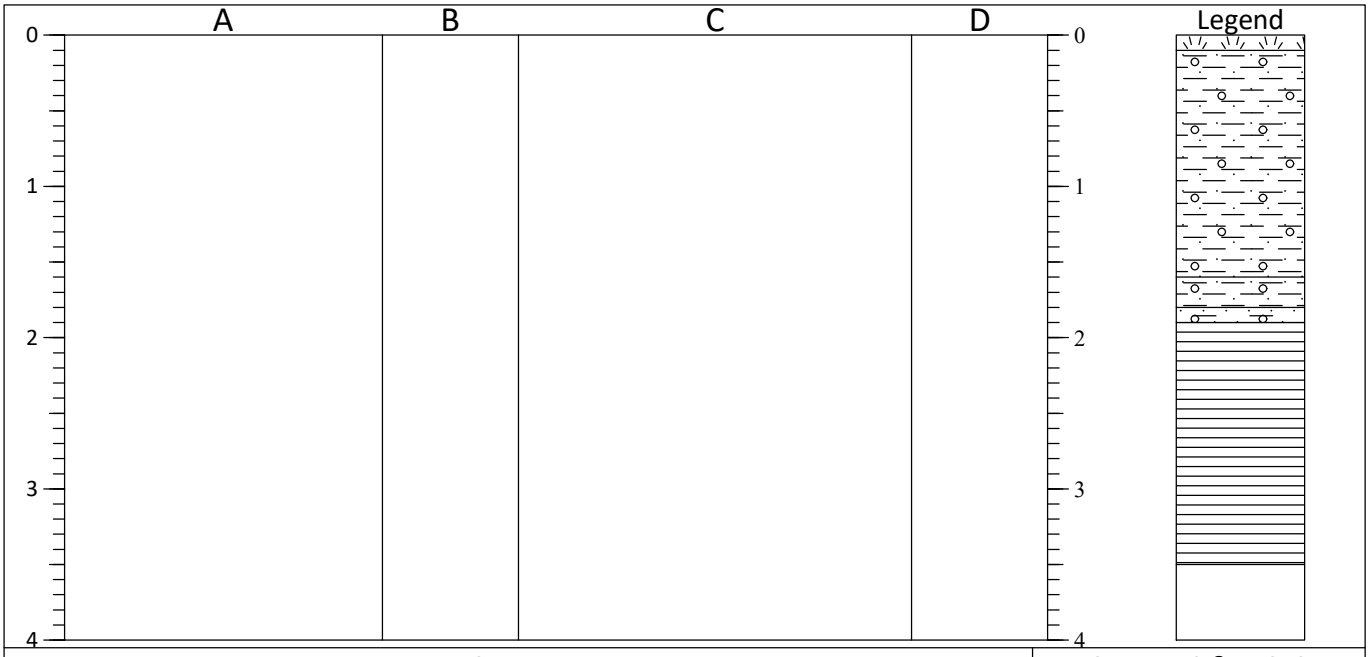
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

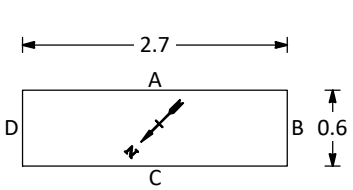
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP04**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22	138.66	E 419,284.5 N 414,749.9	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Dark brown sandy clayey TOPSOIL with rootlets.			
0.10-1.60		Firm light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular of sandstone.	0.10	E	
			0.50	E	
			0.90	D	
1.60-1.80		Firm to stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of mudstone and coal.			
1.80-1.90			1.70	D	
1.90-3.50		Grey and black clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular of mudstone and coal.			
		MUDSTONE recovered as grey with red weathered surface sandy fine to coarse subangular gravel.	2.50	D	
3.50		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

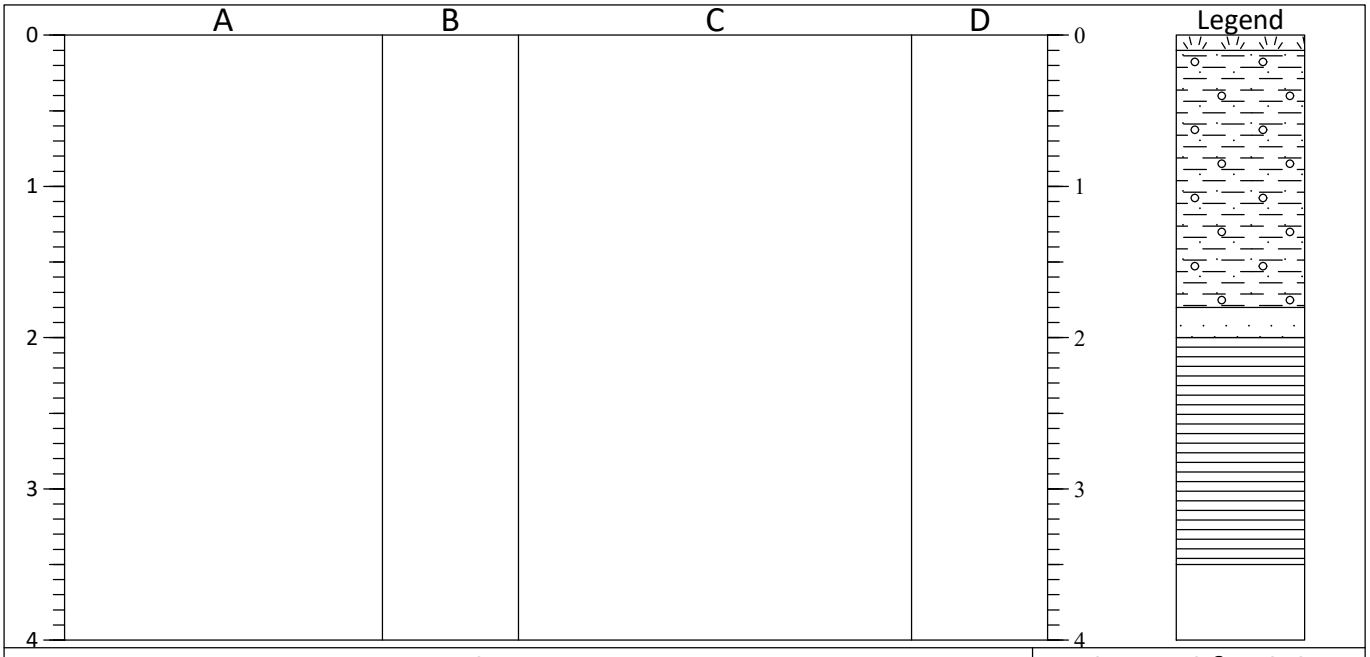
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

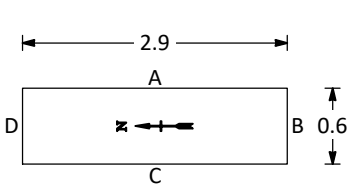
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP05
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	21-02-22	135.47	E 419,229.2 N 414,730.5	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		Dark brown sandy clayey TOPSOIL with rootlets.			
0.10-1.80		Firm to stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone coal and mudstone.	0.10	E	
			0.50	E	
			1.00	D	
1.90-2.00		Grey and black clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular of mudstone and coal.	1.90	D	
2.00-3.50		MUDSTONE recovered as grey sandy fine to coarse subangular gravel.	2.40	D	
3.50		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

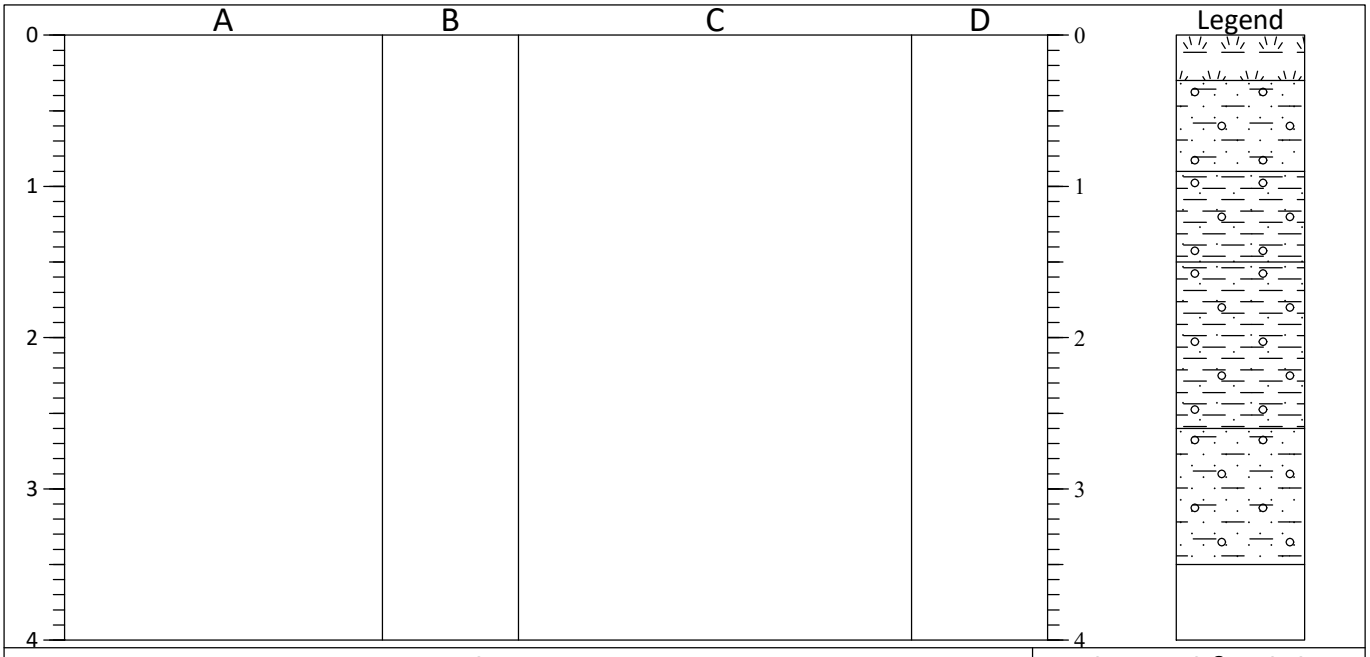
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

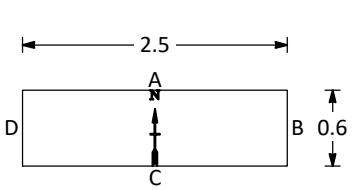
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP06
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	138.78	E 419,310.4 N 414,693.5	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Dark brown sandy clayey TOPSOIL with rootlets.	0.20	E	
0.30-0.90		Light brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular of sandstone.	0.60	E	
0.90-1.50		Light brown with grey mottling sandy gravelly CLAY. Gravel is fine to medium subangular of sandstone mudstone and coal.	1.10	D	
1.50-2.60		Stiff grey sandy gravelly CLAY. Gravel is fine to caorse subangular of sandstone mudstone and coal.	1.60	E	
2.60-3.50		Light brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse subangular of mudstone.	2.80	D	
3.50		End of trial pit			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. Groundwater encountered at 0.8 m, fast flow from north of pit, slow seepage from south.

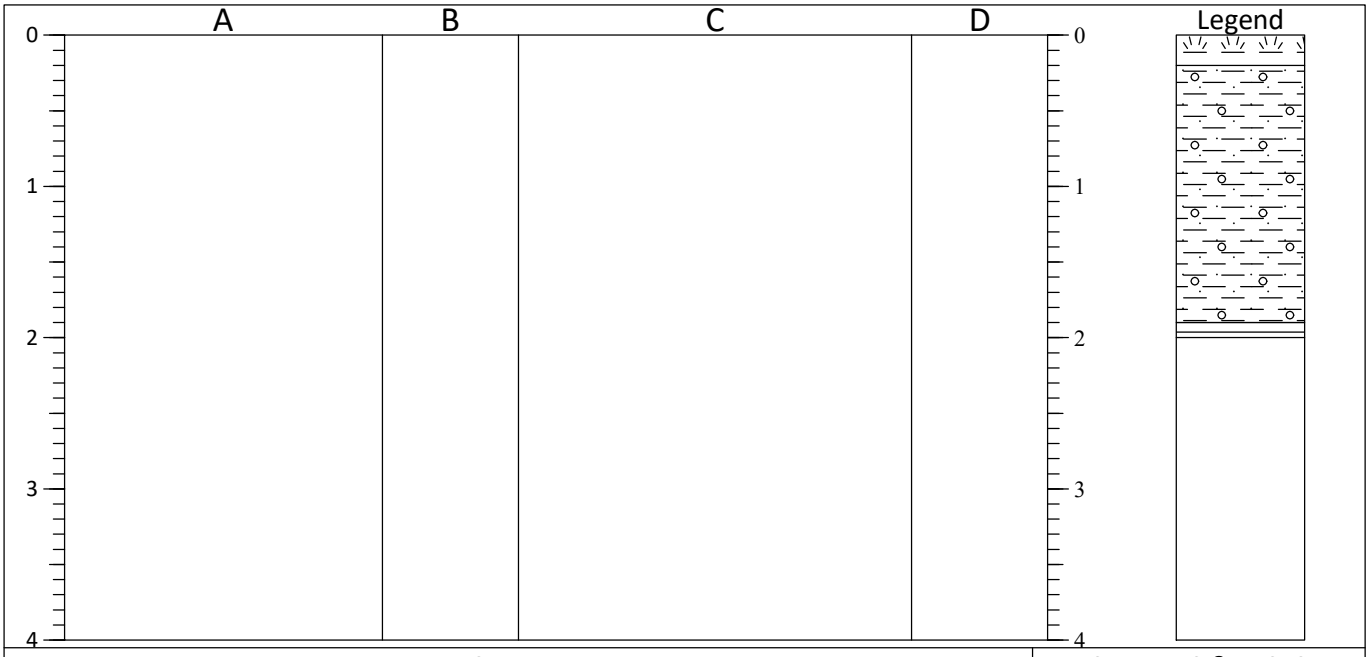
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

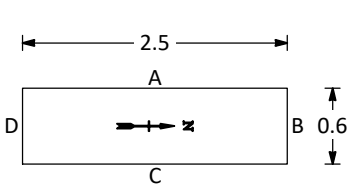
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP07
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	137.36	E 419,283.7 N 414,680.3	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.	0.10	E	
0.20-1.90		Firm to stiff light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular of sandstone.	0.70	E	
			0.90	D	
1.90-2.00		Mudstone recovered as grey clayey sandy fine to coarse subangular gravel.			
2.00		End of trial pit.	2.00	D	

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

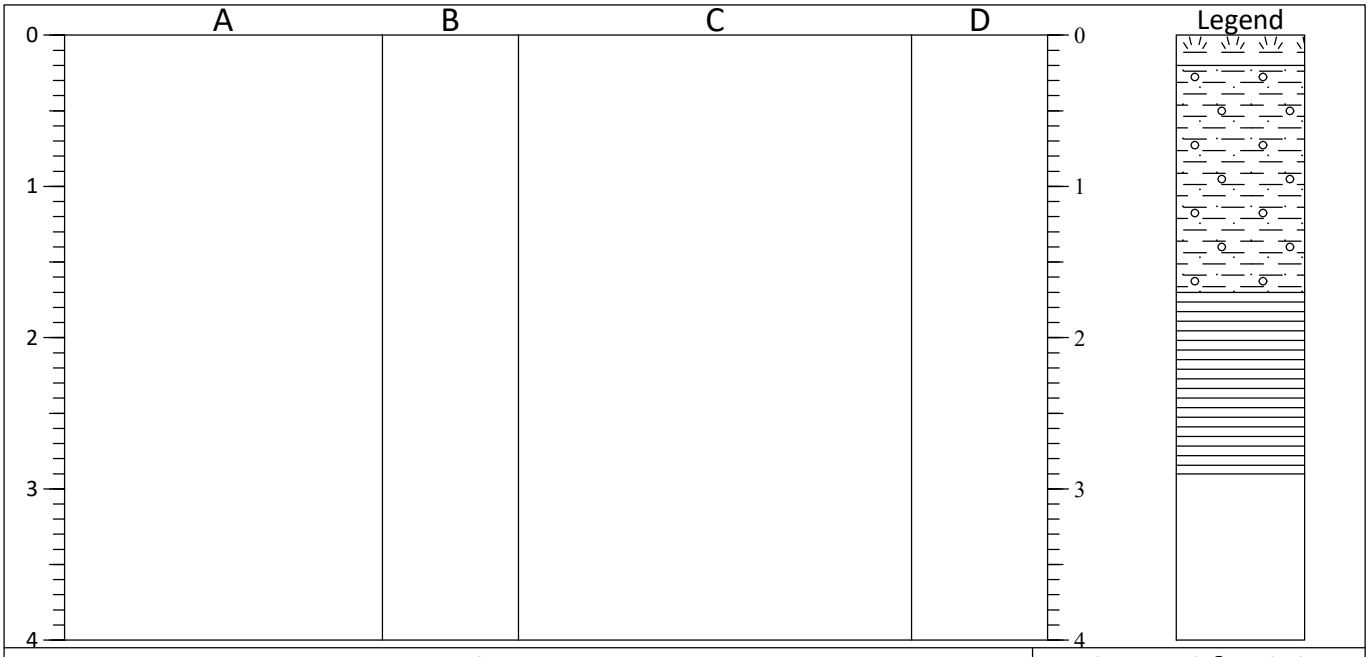
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

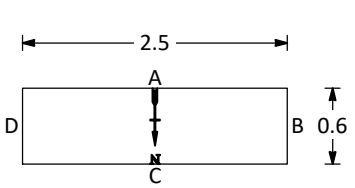
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP08**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	134.76	E 419,217.8 N 414,672.4	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.			
0.20-1.70		Firm light brown sandy slightly gravelly CLAY. Gravel is fine to medium subangular of mudstone.			
1.70-2.90		MUDSTONE recovered as grey clayey sandy fine to coarse subangular gravel.			
2.90		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

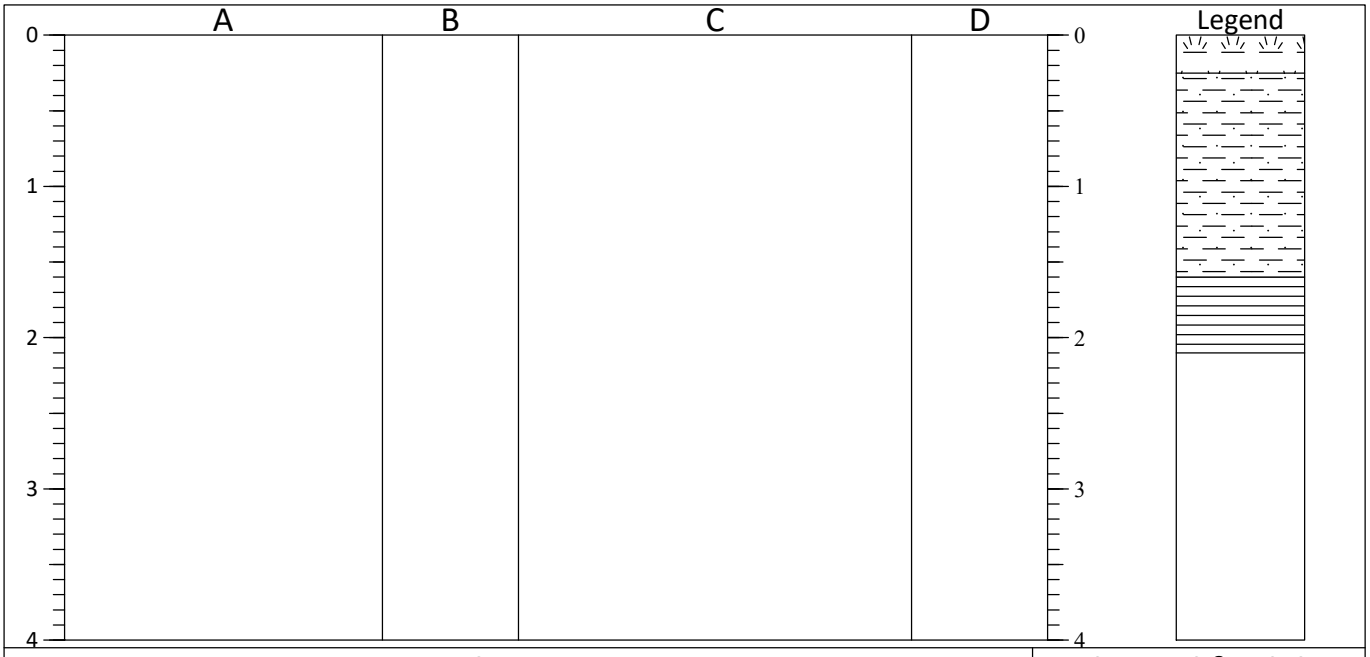
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

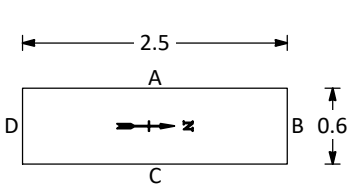
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP09
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	134.85	E 419,231.2 N 414,624.4	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Dark brown sandy clayey TOPSOIL with rootlets.			
0.25-1.60		Firm light brown and grey sandy CLAY.	0.80	D	
			1.40	D	
1.60-2.10		Grey with weathered orange surface weak weathered thinly bedded MUDSTONE bedrock.			
2.10		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

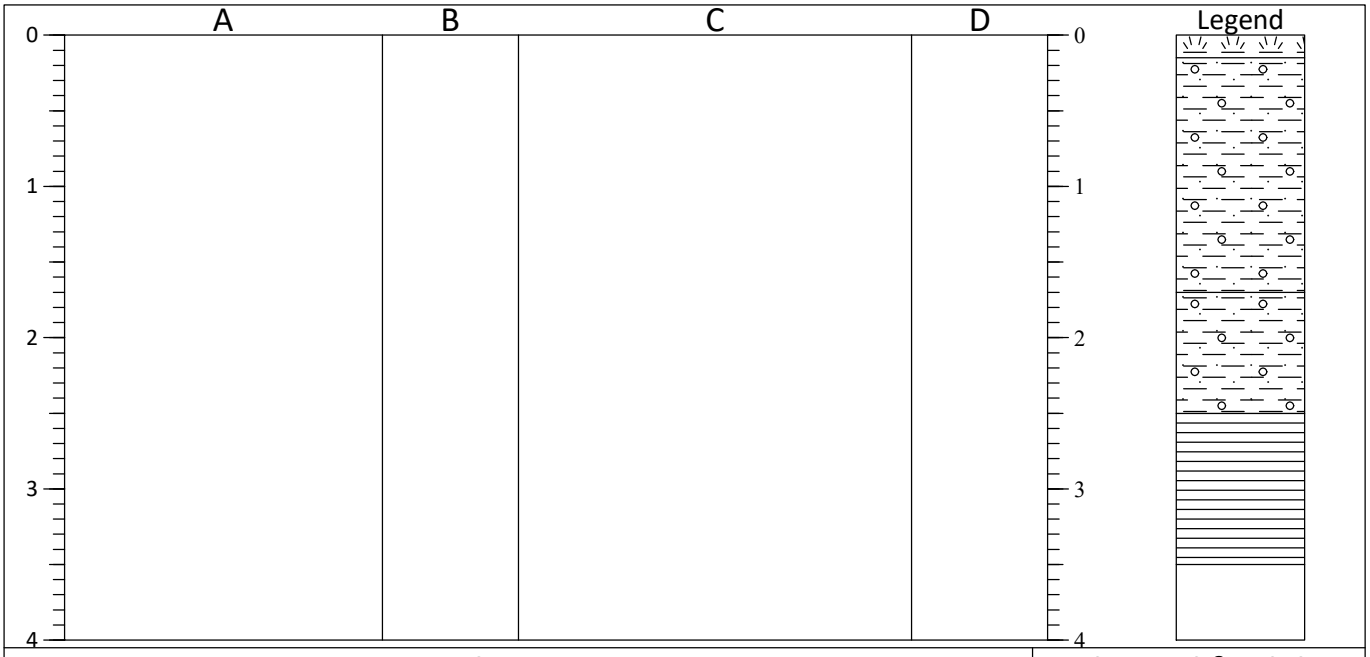
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

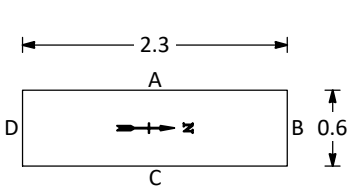
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	137.42	E 419,292.9 N 414,639.2	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		Dark brown sandy clayey TOPSOIL with rootlets.			
0.15-1.70		Firm light brown sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular of sandstone.	0.10	E	
			0.70	E	
1.70-2.50		Stiff grey sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone mudstone and coal.			
2.50-3.50		MUDSTONE recovered as grey clayey sandy fine to coarse subangular gravel.			
3.50		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. Field drain at 0.9 m bgl in east of pit.

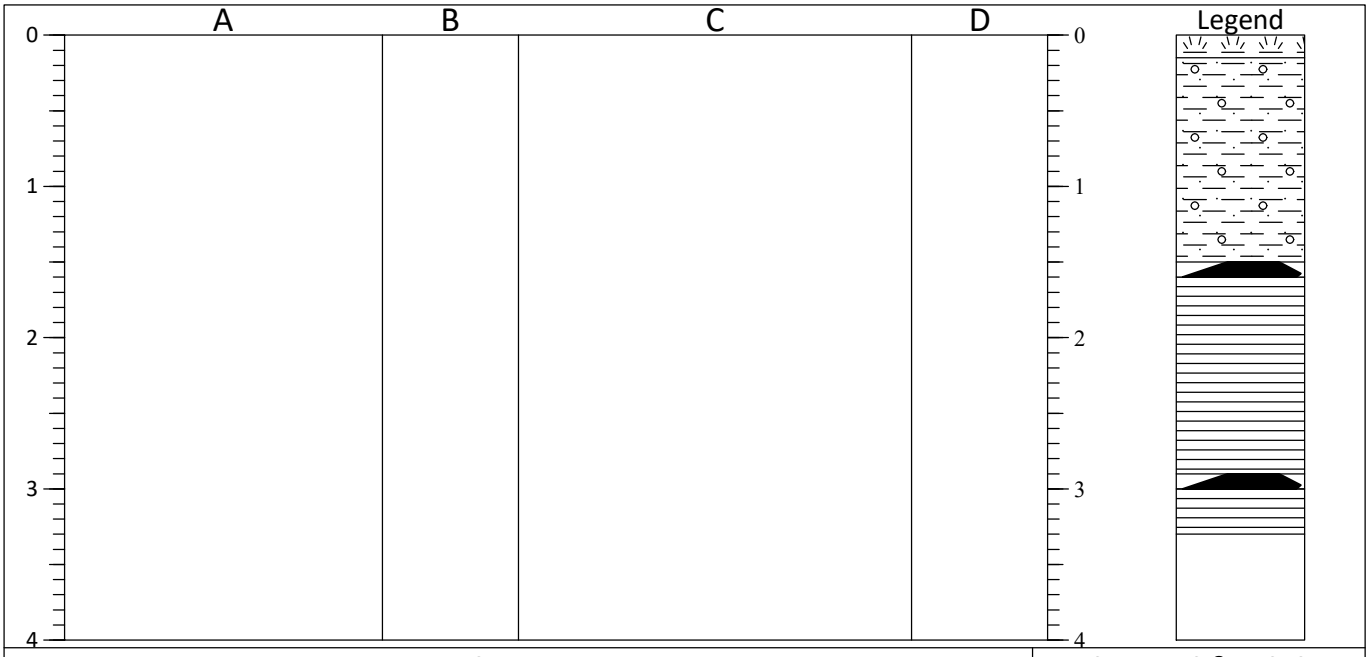
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

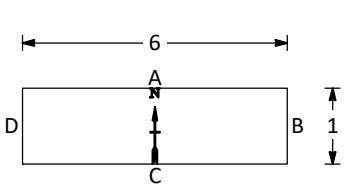
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP12
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	136.33	E 419,306.7 N 414,554.8	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		Dark brown sandy clayey TOPSOIL with rootlets.			
0.15-1.50		Firm orangish brown and grey sandy gravelly CLAY. Gravel is fine to coarse subangular sandstone and mudstone.			
1.50-1.60		Weathered COAL recovered as firm black sandy clay.			
1.60-2.90		Weathered MUDSTONE recovered as stiff grey sandy gravelly clay.			
2.90-3.00		COAL recovered as gravelly fine to coarse sand.			
3.00-3.30		Grey medium strong weathered thinly bedded MUDSTONE bedrock.			
3.30		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

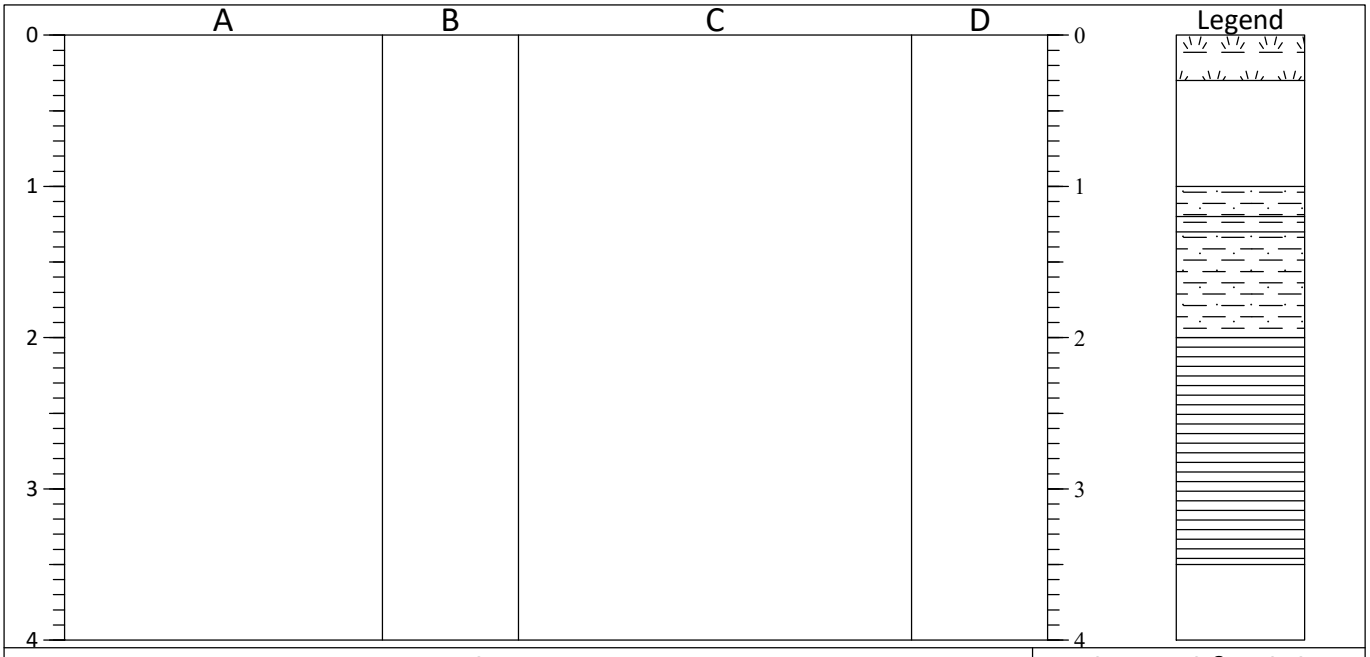
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used JCB 360 Excavator	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

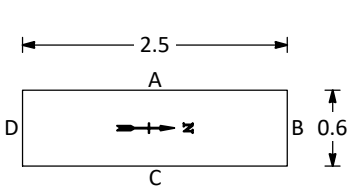
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP13
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	138.41	E 419,336.1 N 414,602.5	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Dark brown sandy clayey TOPSOIL with rootlets.			
0.30-1.00		Firm light brown and grey sandy slightly gravelly CLAY. Gravel is fine to medium subangular sandstone mudstone and coal.	0.20	E	
			0.70	E	
1.00-1.20		Firm to stiff light grey thinly laminated sandy CLAY.	1.00	D	
1.20-1.30		Black organic sandy CLAY.	1.20	D	
1.30-2.00		Firm to stiff light grey thinly laminated sandy CLAY.			
2.00-3.50		MUDSTONE recovered as grey clayey sandy fine to coarse subangular gravel.	2.10 2.20	E D	
3.50		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

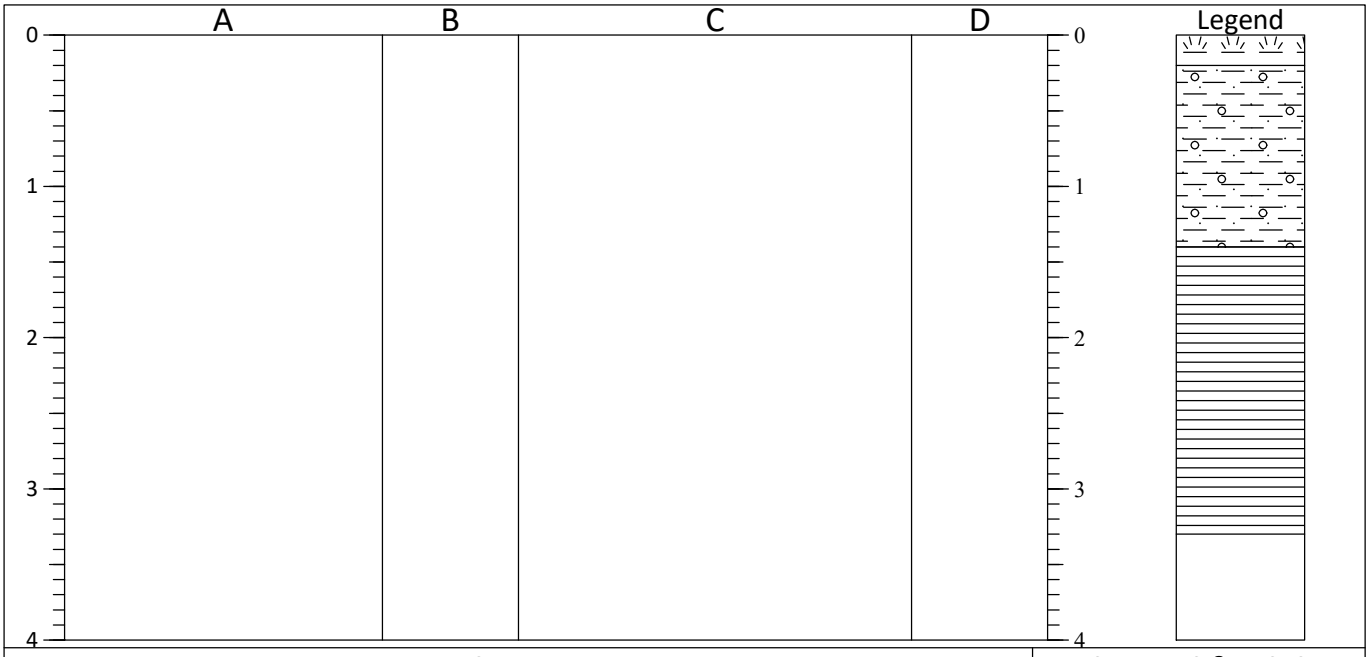
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

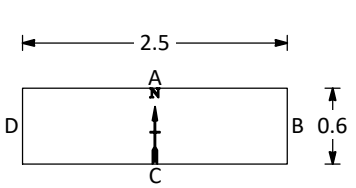
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP14**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	134.70	E 419,242.7 N 414,563.5	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.			
0.20-1.40		Firm light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular of sandstone.			
1.40-3.30		MUDSTONE recovered as grey clayey sandy fine to coarse subangular gravel.			
3.30		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

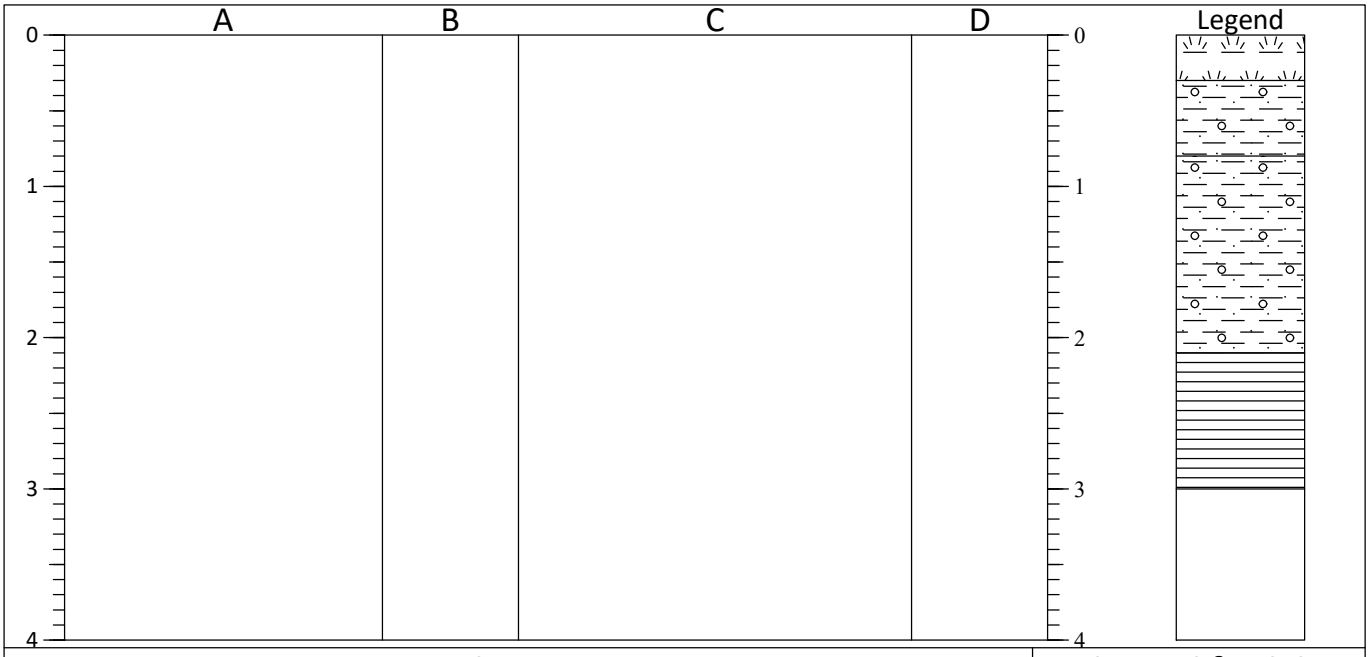
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

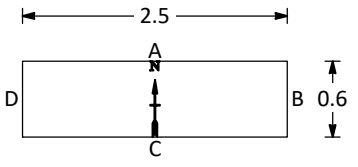
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP15
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	22-02-22	136.44	E 419,337.3 N 414,519.4	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Dark brown sandy clayey TOPSOIL with rootlets.	0.20	E	
0.30-0.80		Firm light brown and grey sandy slightly gravelly CLAY. Gravel is fine to coarse subangular of sandstone. Low cobble content subangular of sandstone.	0.50	E	
0.80-2.10		Stiff grey and brown sandy slightly gravelly CLAY. Gravel is fine to medium subangular of sandstone mudstone and coal.	0.70	D	
			0.90	E	
			1.00	D	
2.10-3.00		MUDSTONE recovered as grey clayey sandy fine to coarse subangular gravel.			
3.00		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

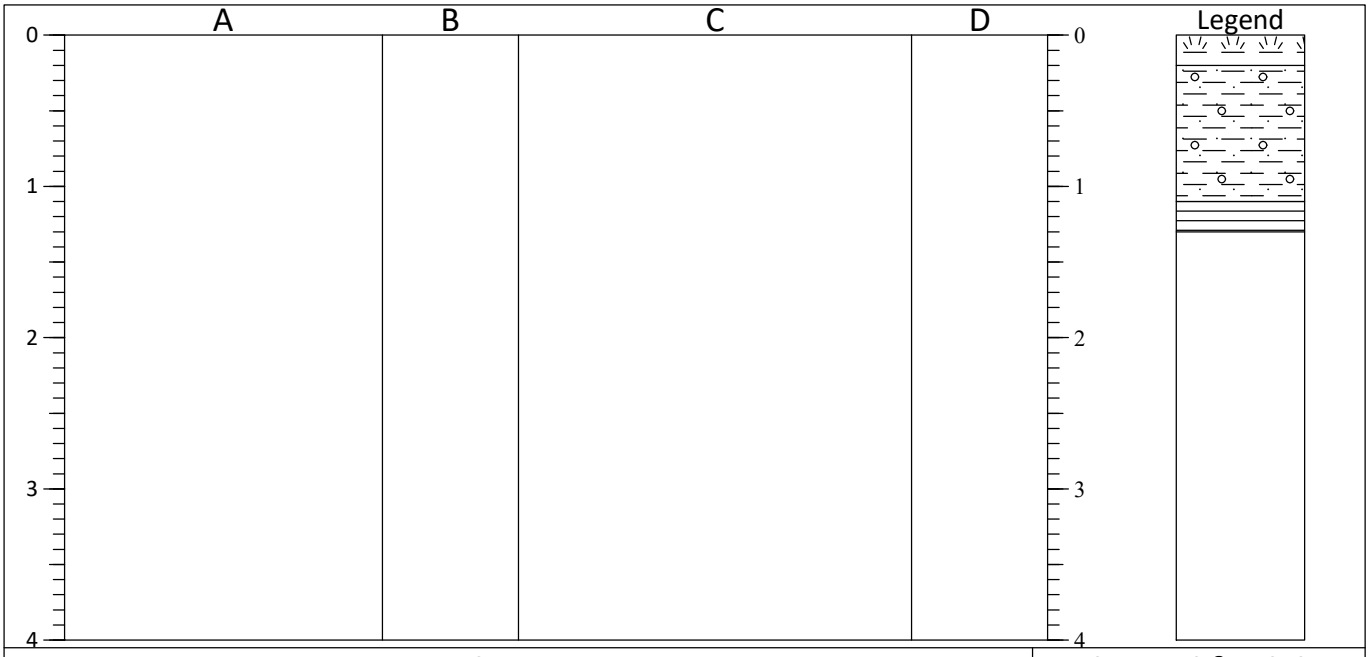
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used Hydromek 102 B	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

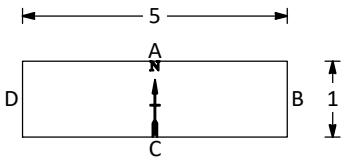
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP16**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	133.35	E 419,238.9 N 414,534.9	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.			
0.20-1.10		Firm light brown very sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone. Low cobble content subangular of mudstone and sandstone.			
1.10-1.30		Grey medium strong weathered thinly bedded MUDSTONE bedrock.			
1.30		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

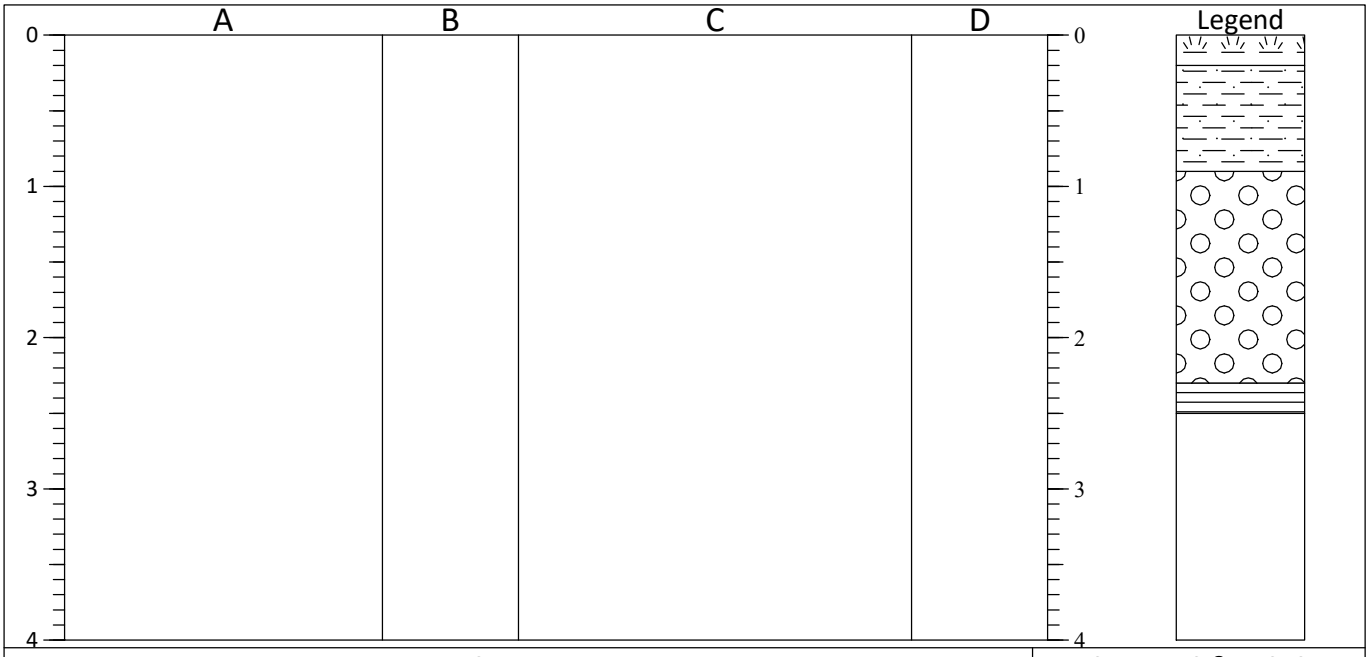
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used JCB 360 Excavator	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

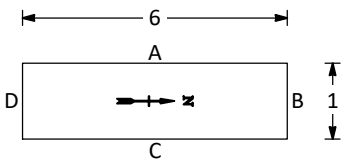
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP17**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	132.76	E 419,200.4 N 414,645.8	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.			
0.20-0.90		Firm brown sandy CLAY.			
0.90-2.30		Sandy gravelly COBBLES of subangular sandstone.			
2.30-2.50		Weak partly weathered thinly bedded grey MUDSTONE.			
2.50		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. Groundwater encountered at 2.3 m as slow seepage.

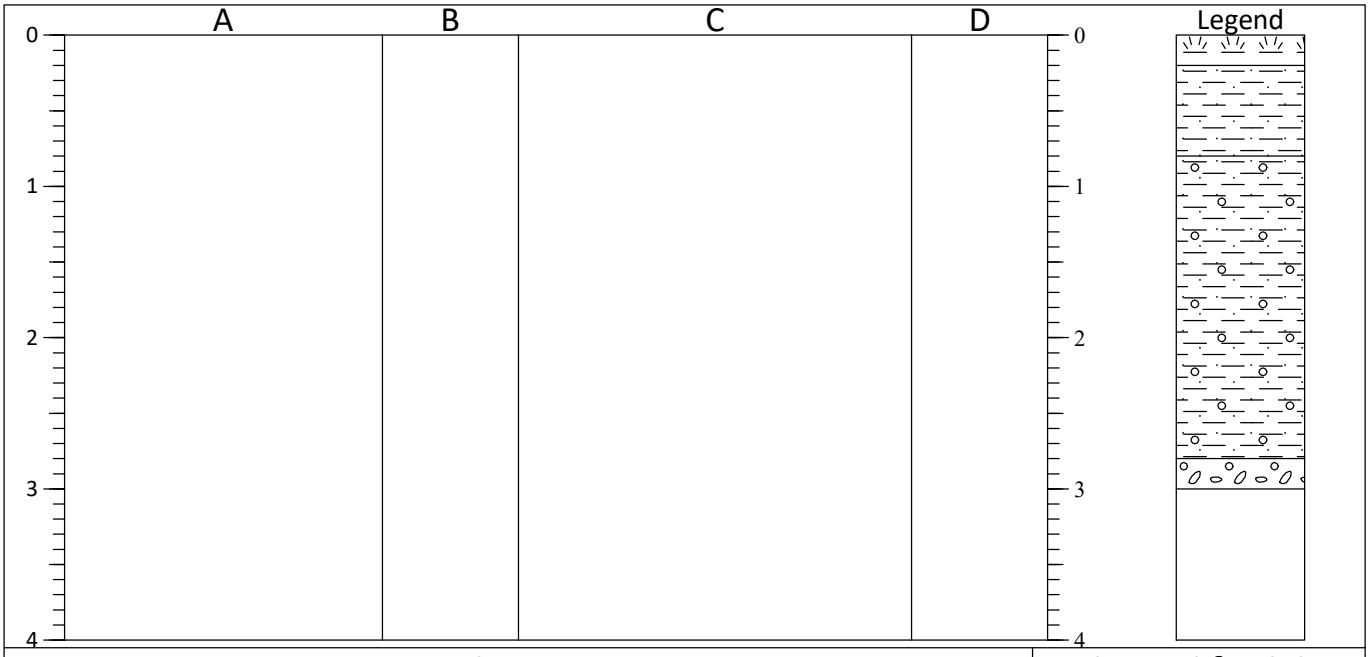
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used JCB 360 Excavator	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

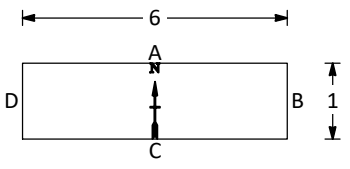
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP18**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	01-03-22	140.34	E 419,361.3 N 414,603.1	
Contractor				Sheet
Hawley Plant Hire Ltd				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		Dark brown sandy clayey TOPSOIL with rootlets.			
0.20-0.80		Firm light brown and orange sandy CLAY.			
0.80-2.80		Firm to stiff grey sandy gravelly CLAY. Gravel is fine to medium subangular of mudstone.			
2.80-3.00		MUDSTONE recovered as grey slightly clayey sandy fine to coarse subangular gravel.			
3.00		End of trial pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

No visual or olfactory signs of contamination. No groundwater encountered.

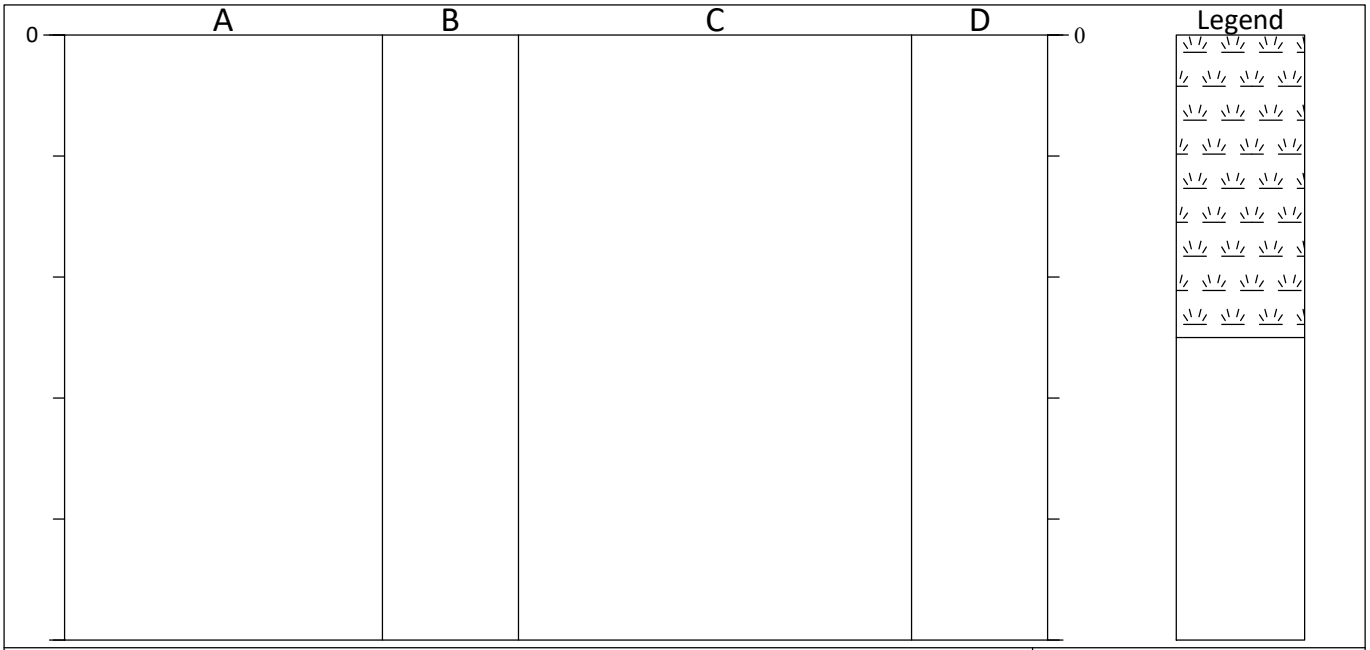
All dimensions in metres Scale 1:50	Client KDC Development Ltd	Method/ Plant Used JCB 360 Excavator	Logged By JG

AGS3 UK TP NEW TP LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

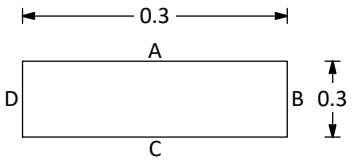
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**HDP01**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,094.0 N 414,617.0	
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

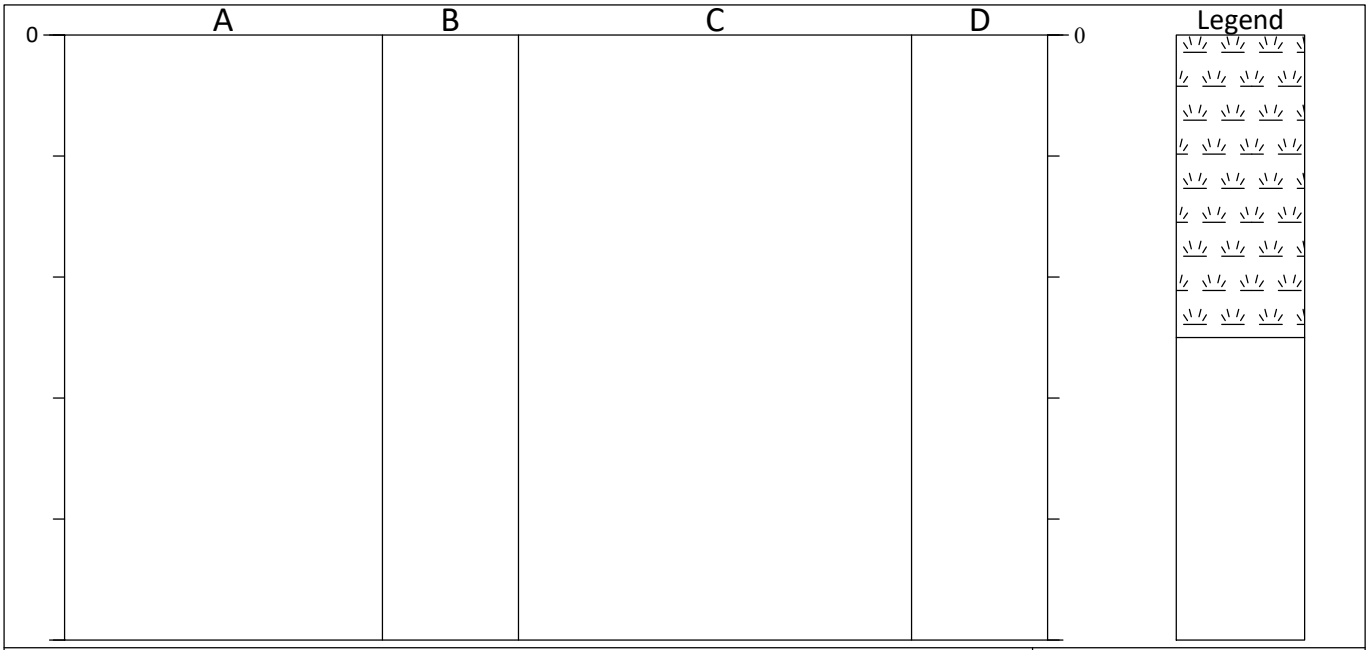
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

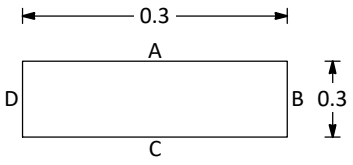
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				HDP02
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,066.0 N 414,584.0	
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

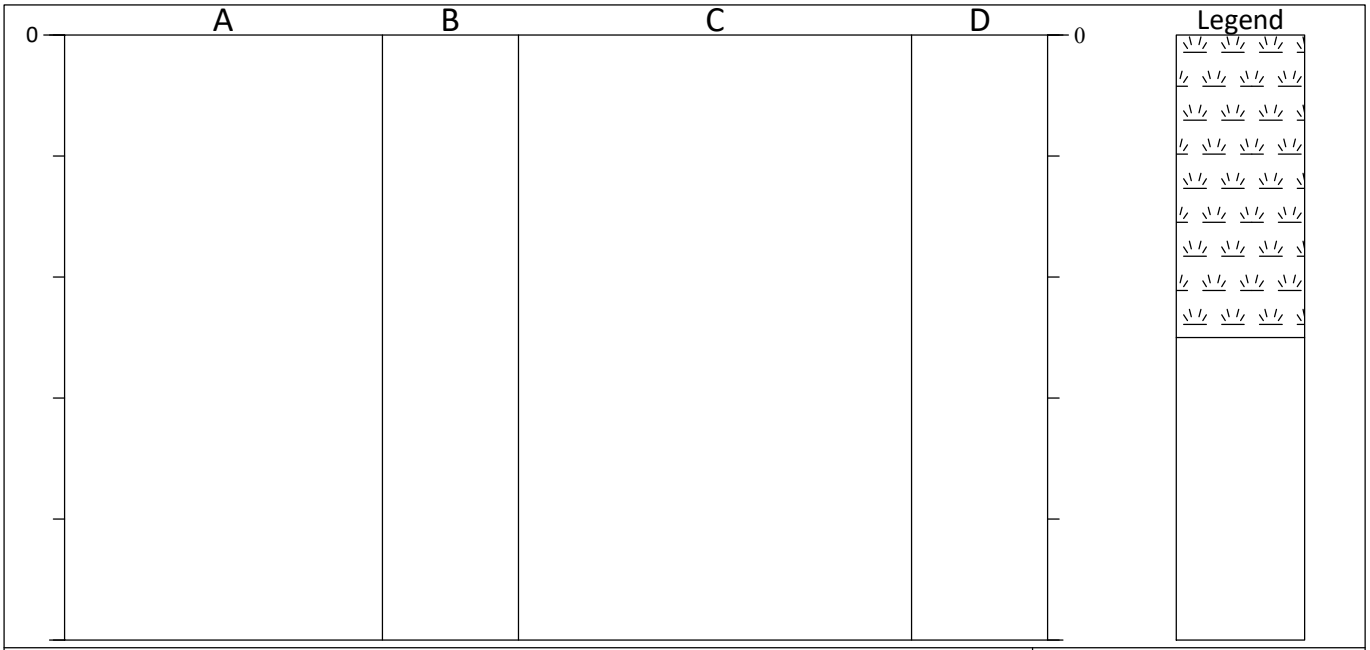
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

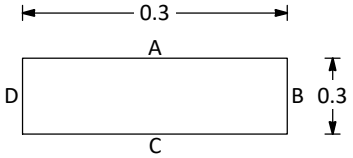
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**HDP03**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,019.0 N 414,581.0	
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

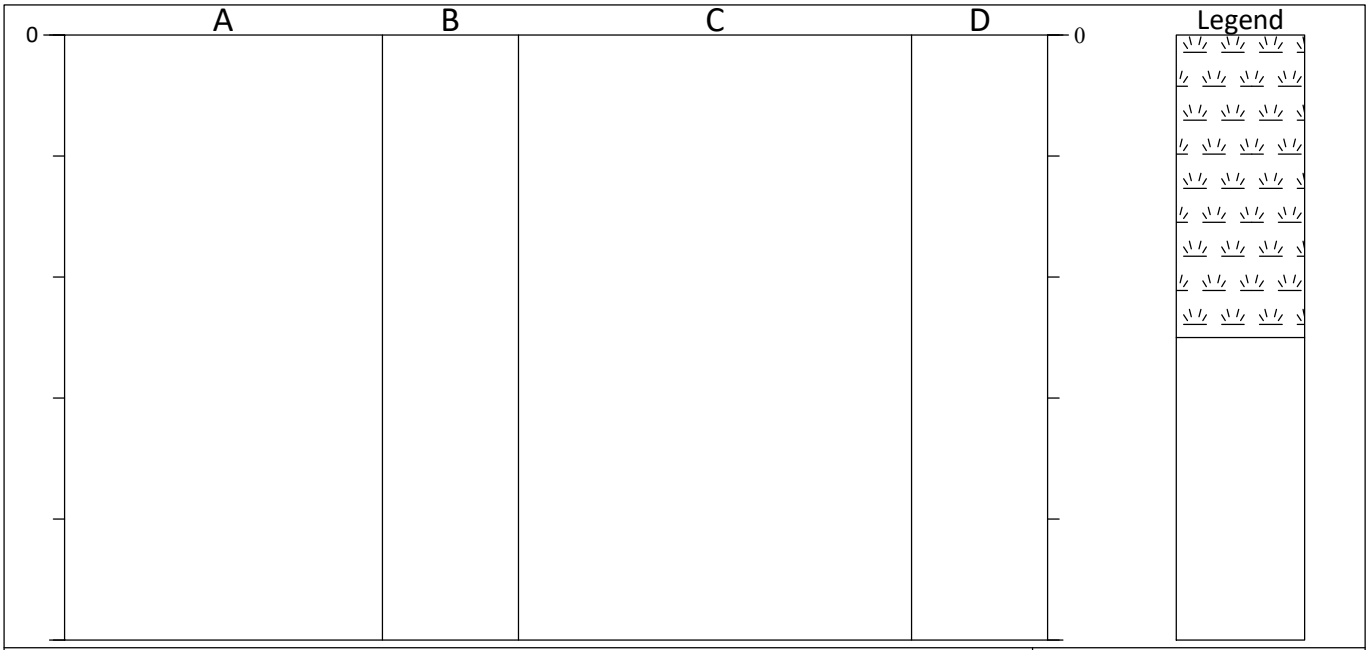
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

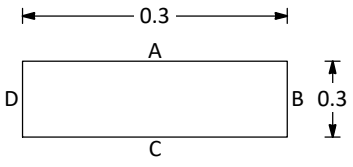
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**HDP04**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,043.0 N 414,549.0	
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

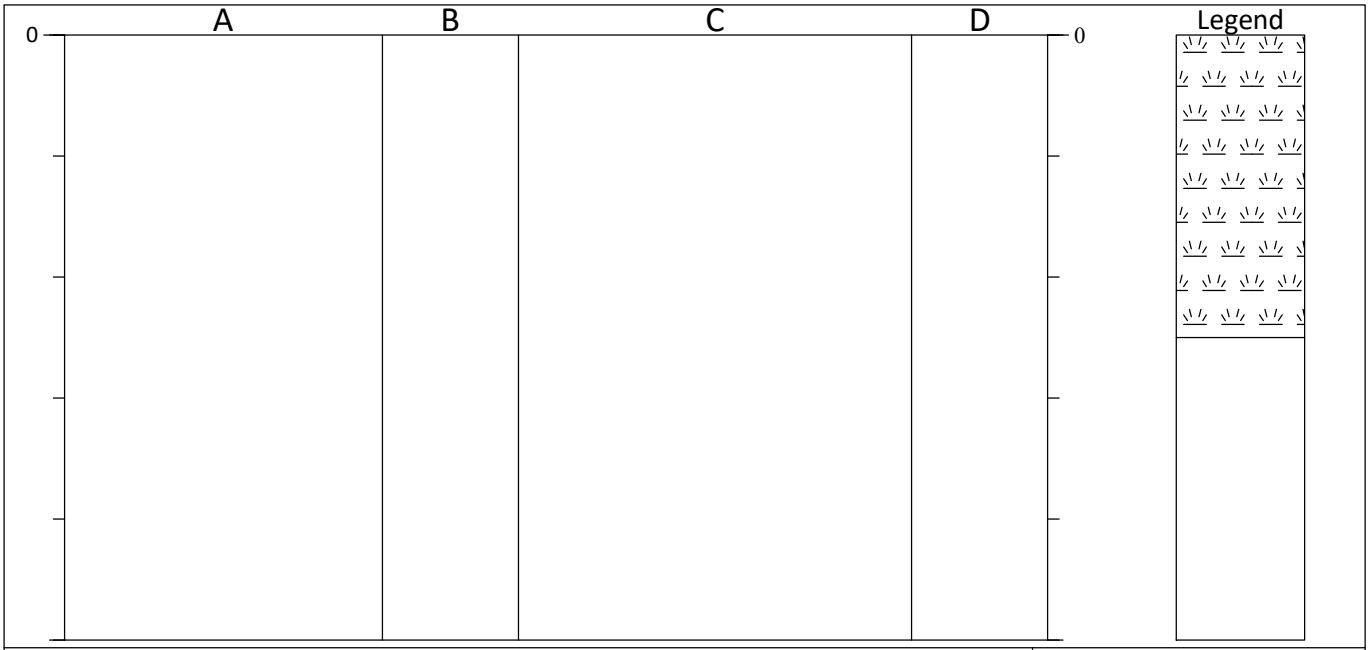
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

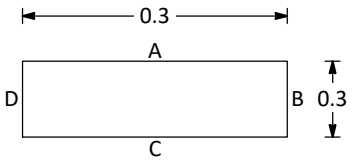
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**HDP05**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23		E 419,002.0 N 414,543.0	
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

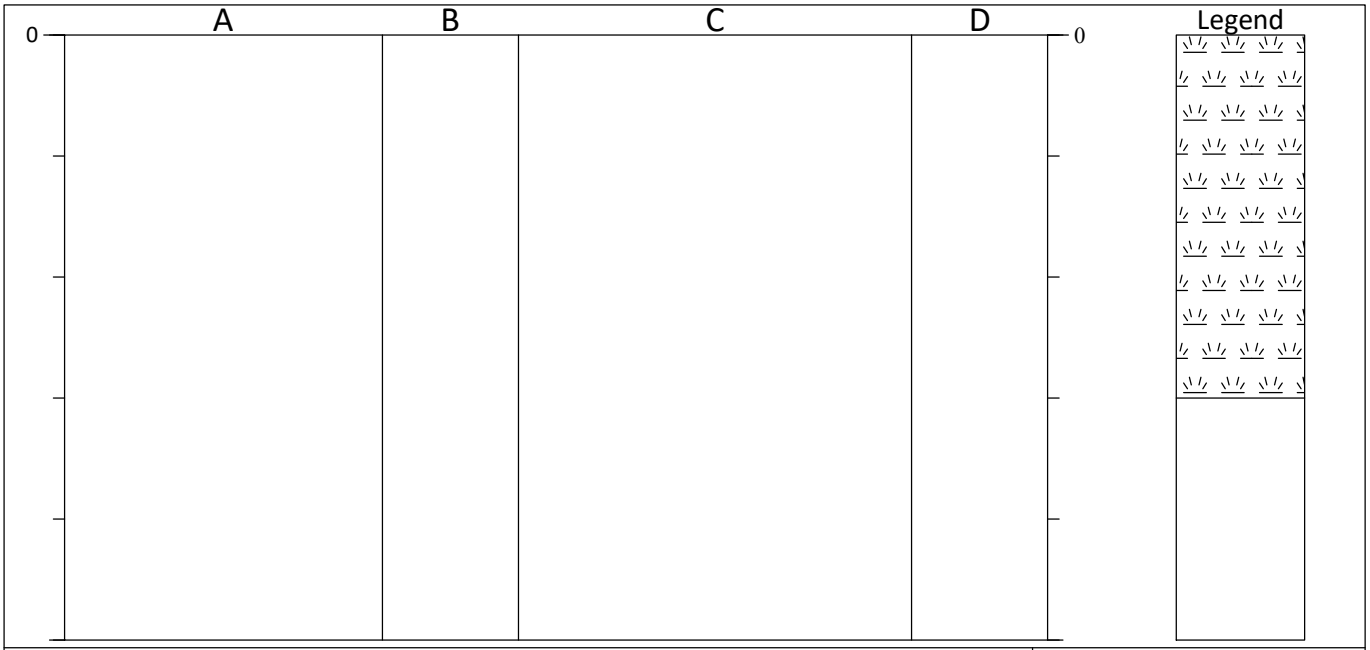
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

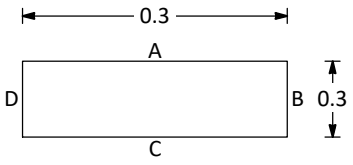
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP01A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

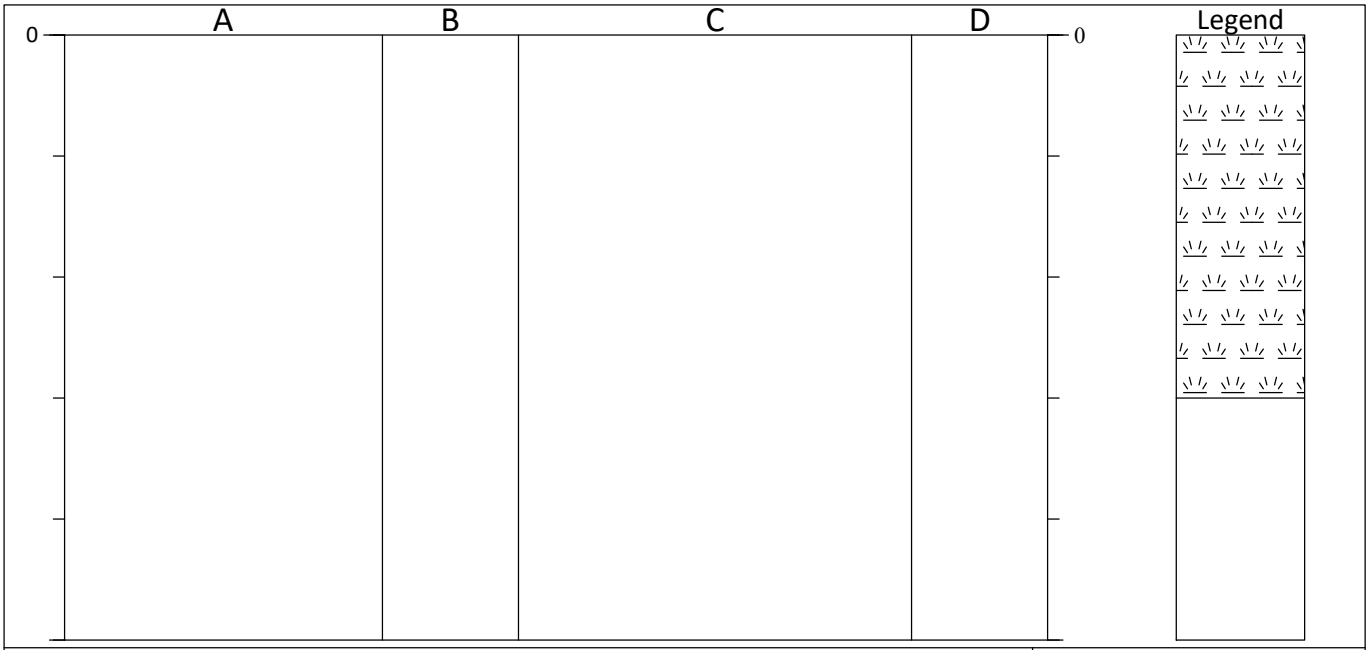
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

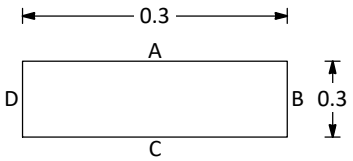
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP01B**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

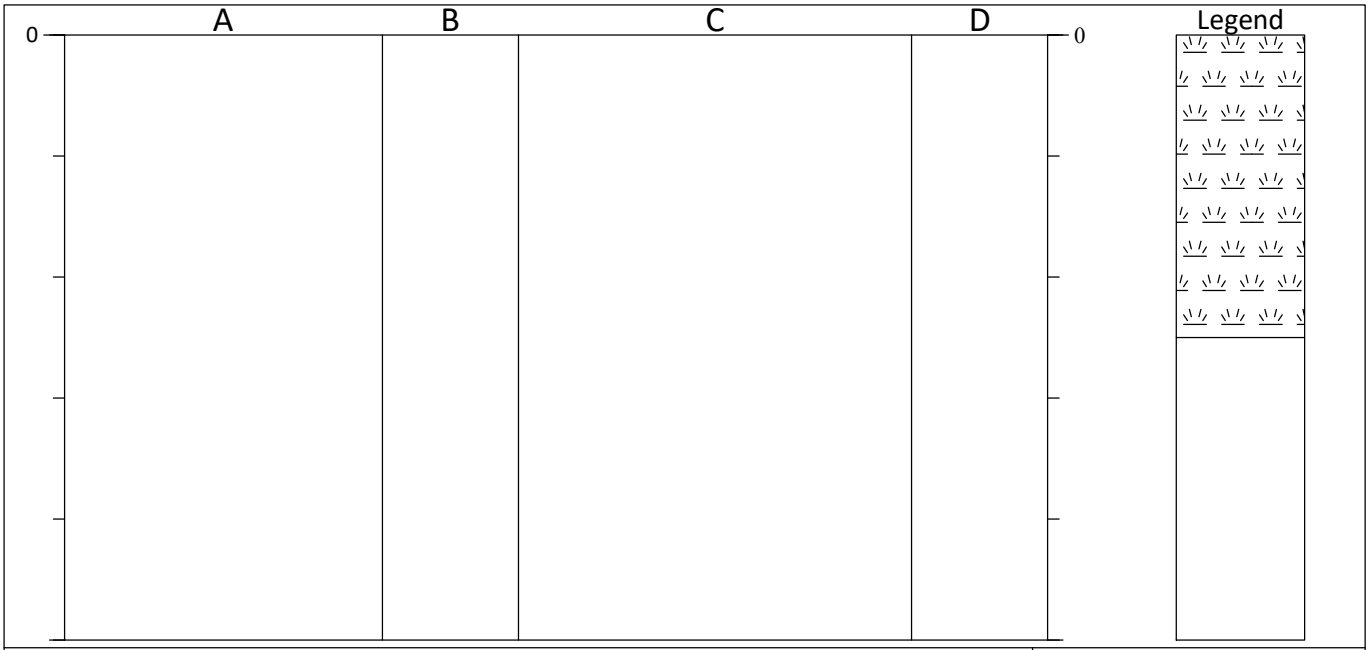
Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

FWS Environmental & Geological Consultants

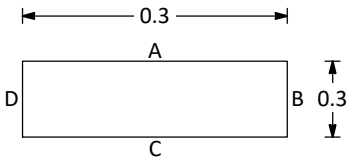
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP02A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

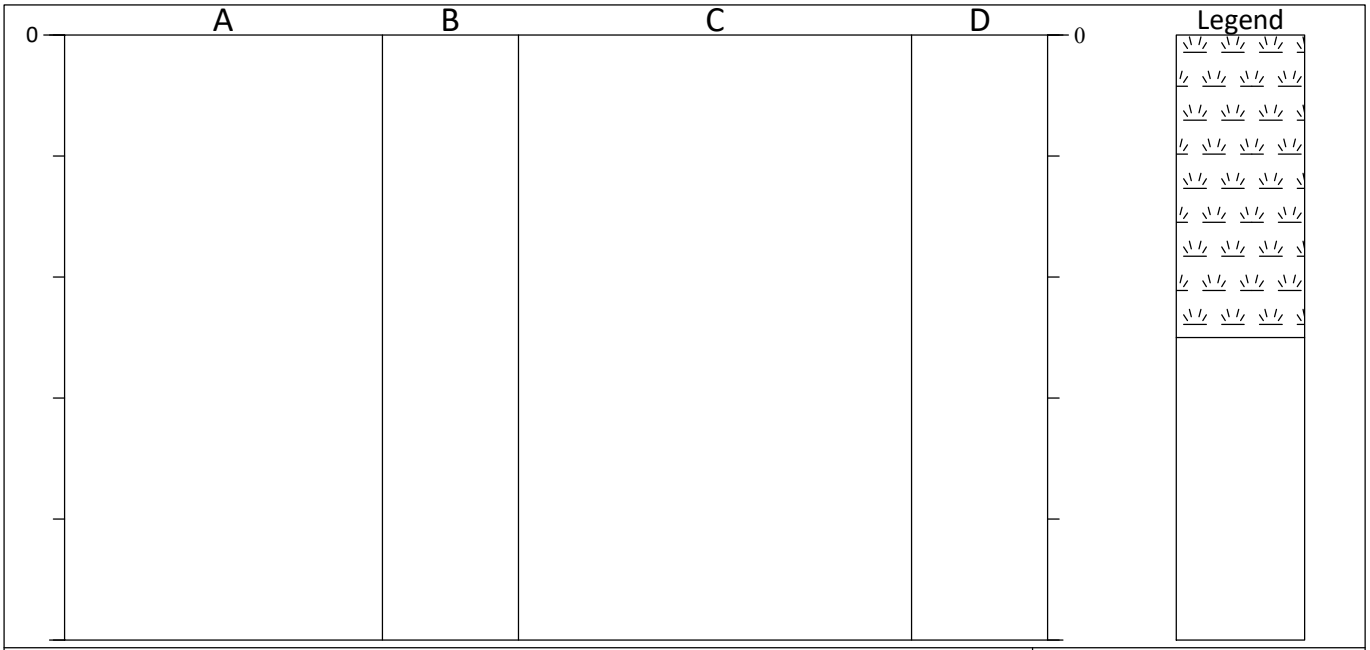
Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

FWS Environmental & Geological Consultants

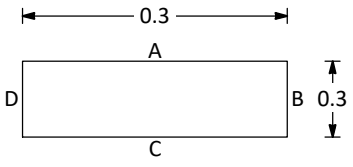
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP02B**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.25		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.25		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.25 m. No Groundwater encountered. No visual or olfactory signs of contamination.

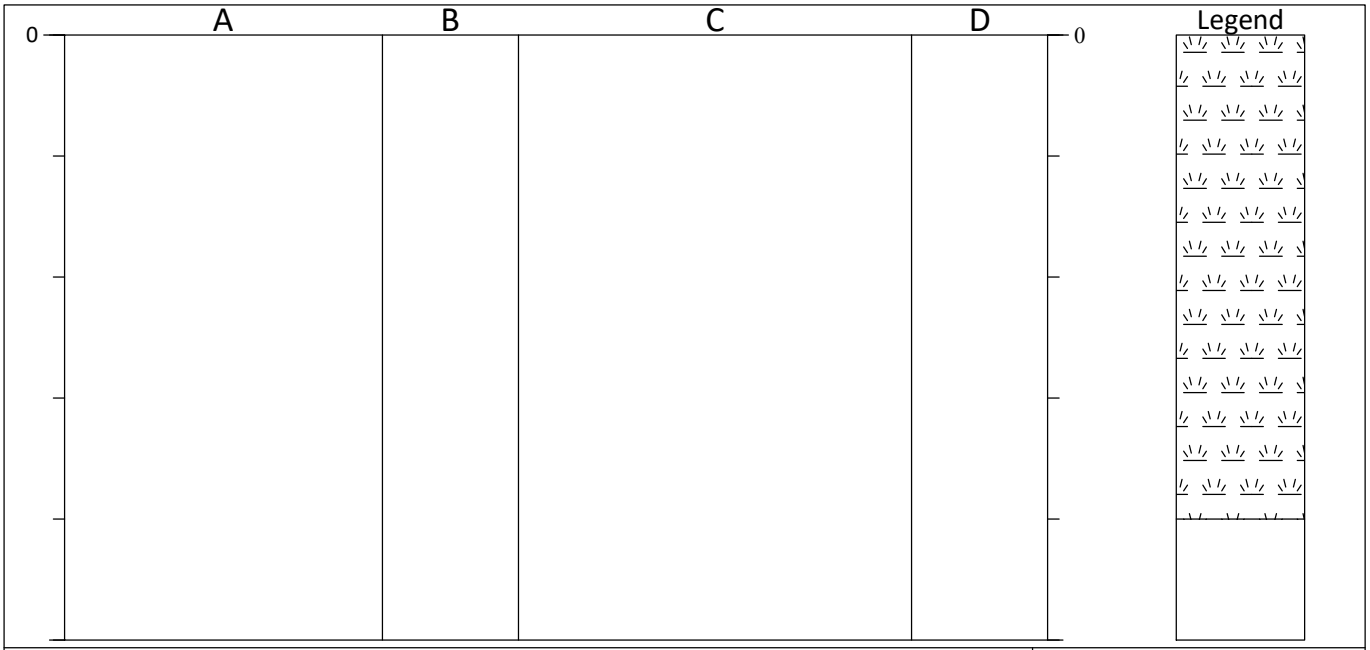
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

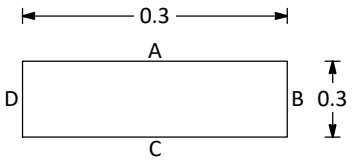
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP03A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of mudstone and coal with occasional rootlets.	0.20	E	
0.40		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.40 m. No Groundwater encountered. No visual or olfactory signs of contamination.

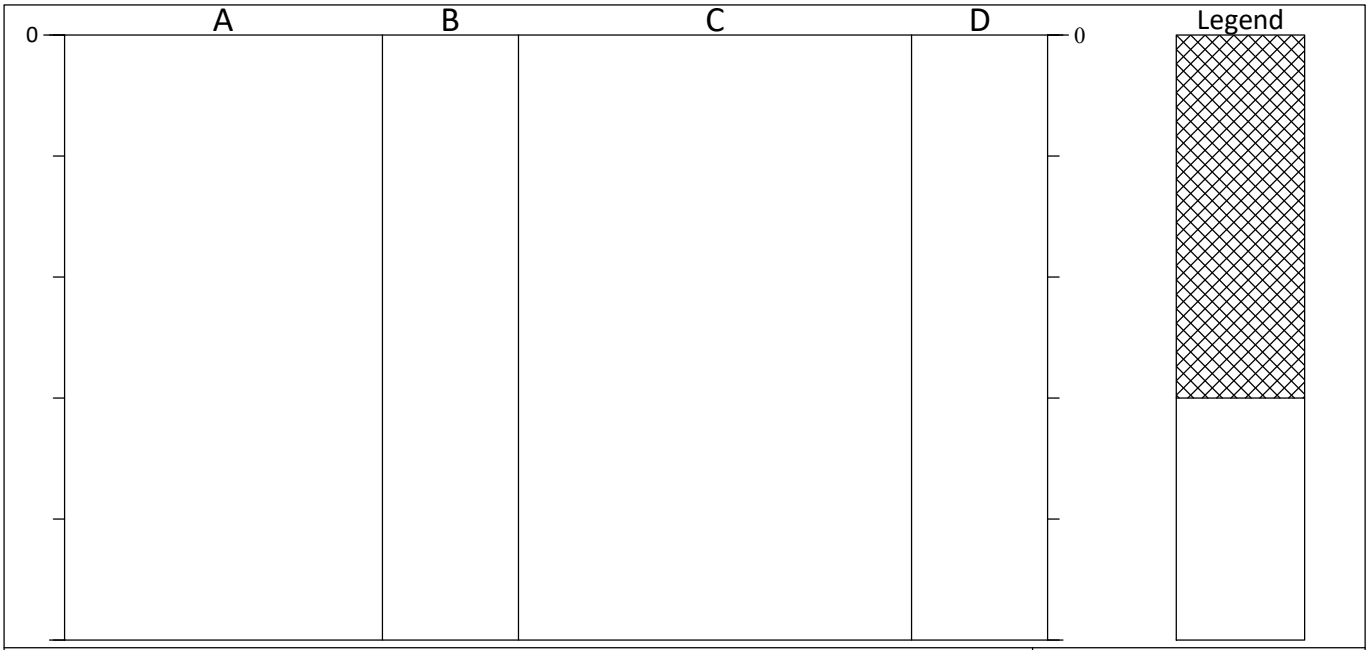
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

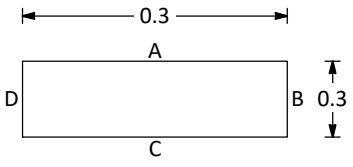
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP03B**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of mudstone coal and rare metal with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

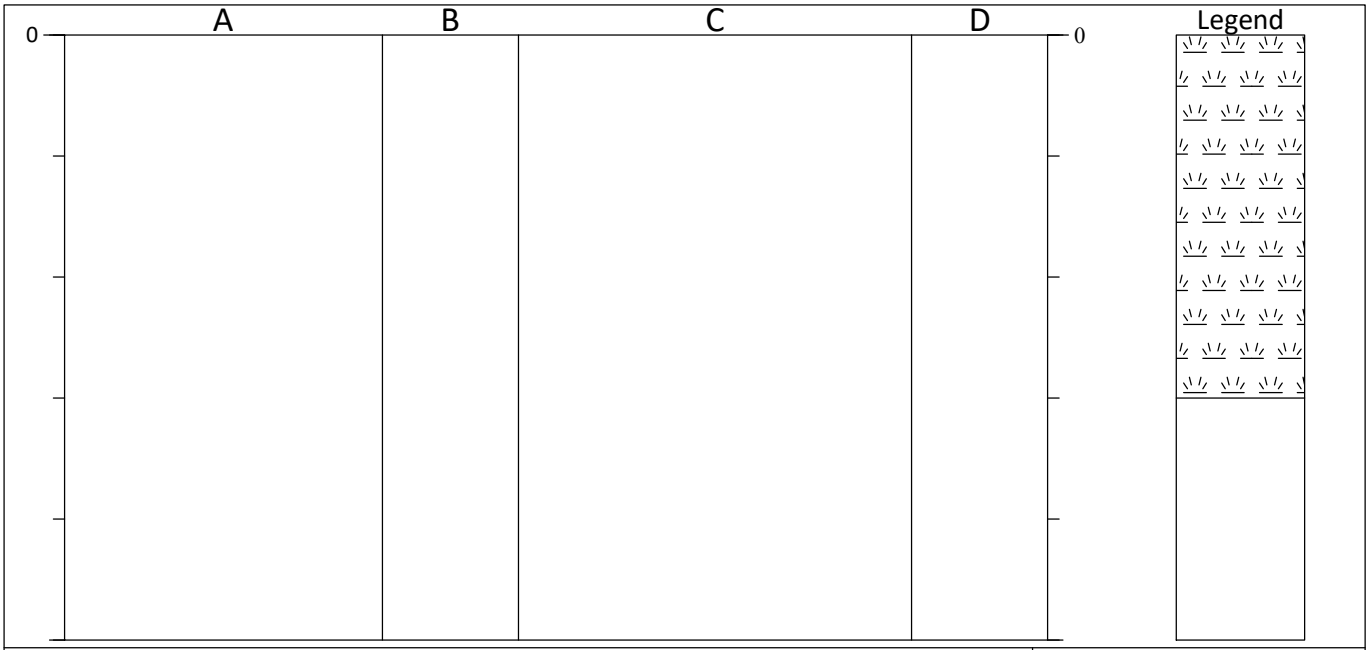
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

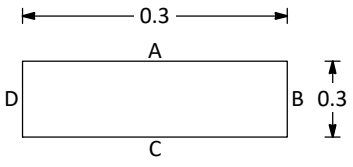
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP03C**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of mudstone and coal with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

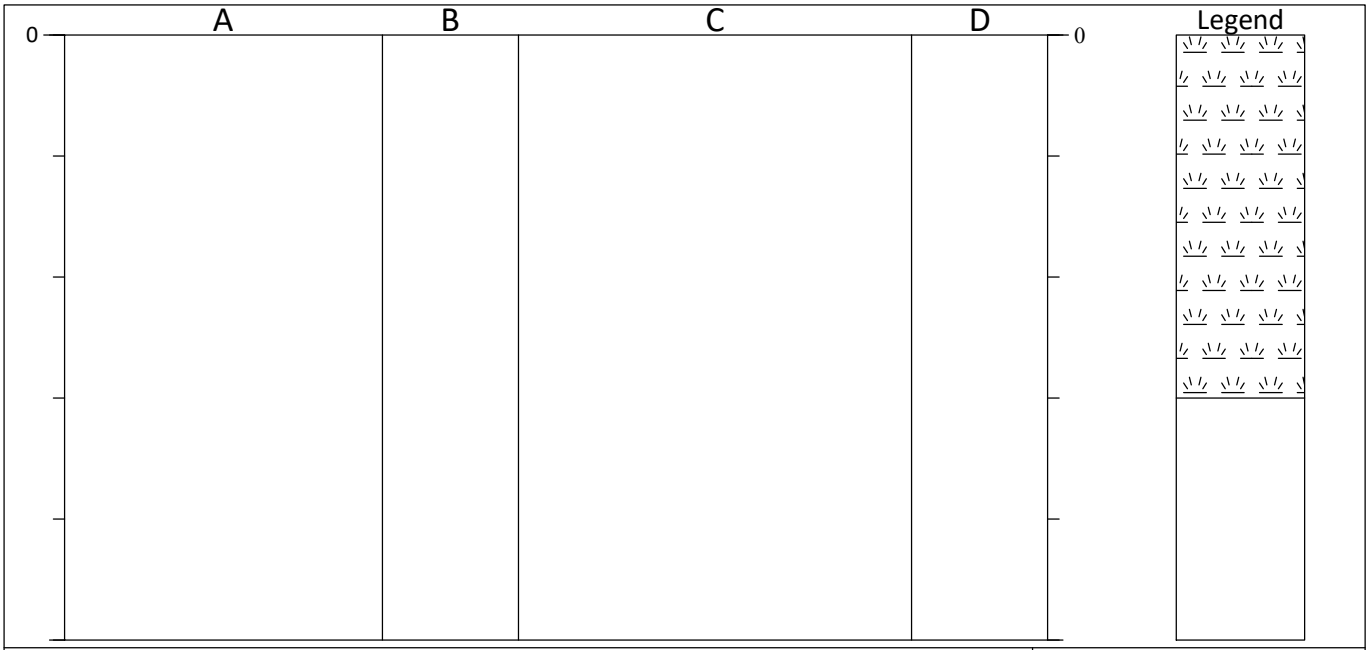
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

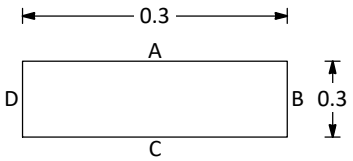
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP03D**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of mudstone and coal with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

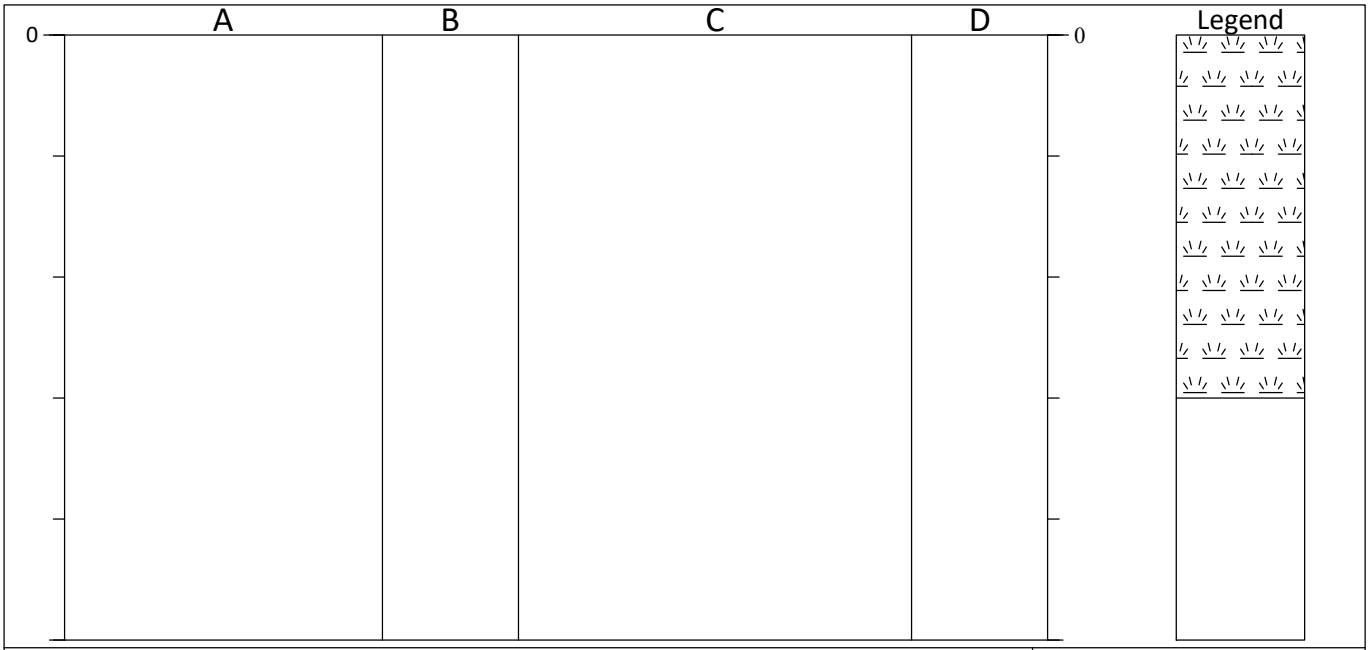
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

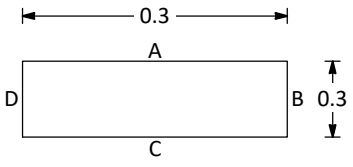
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP03E**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of mudstone and coal with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

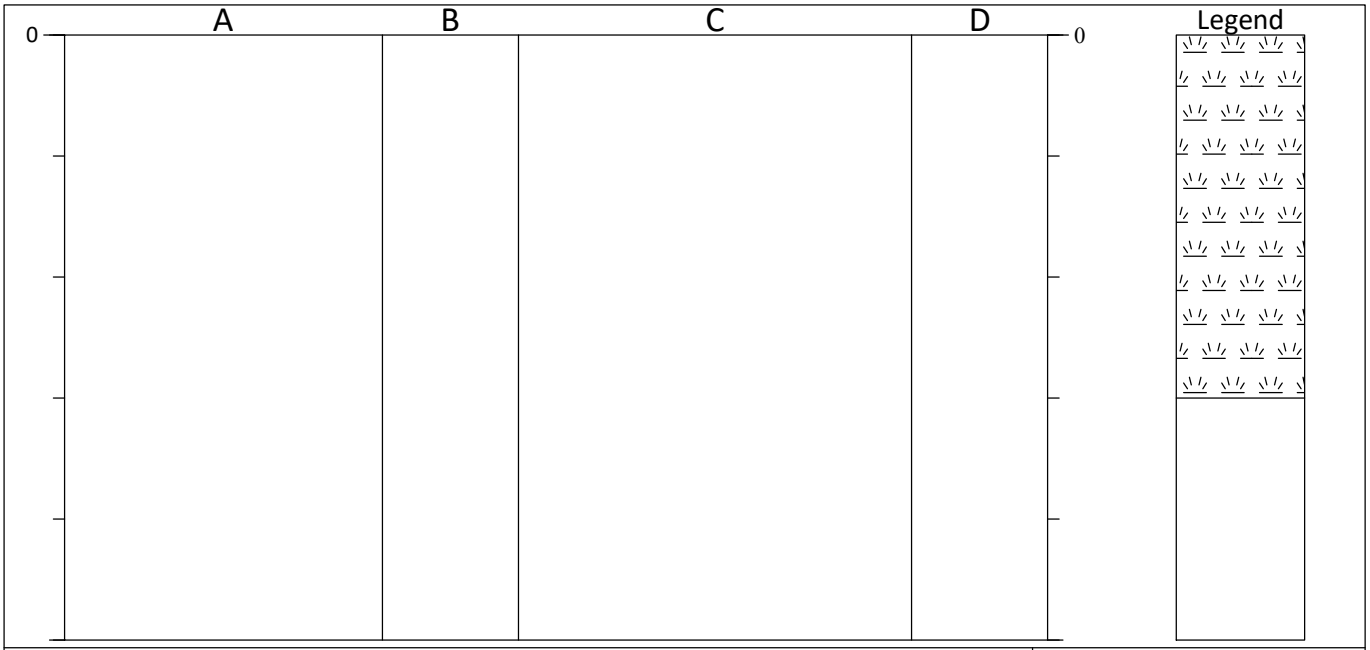
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

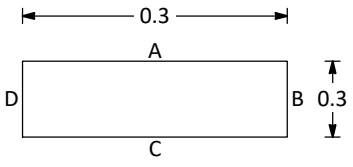
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP06A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

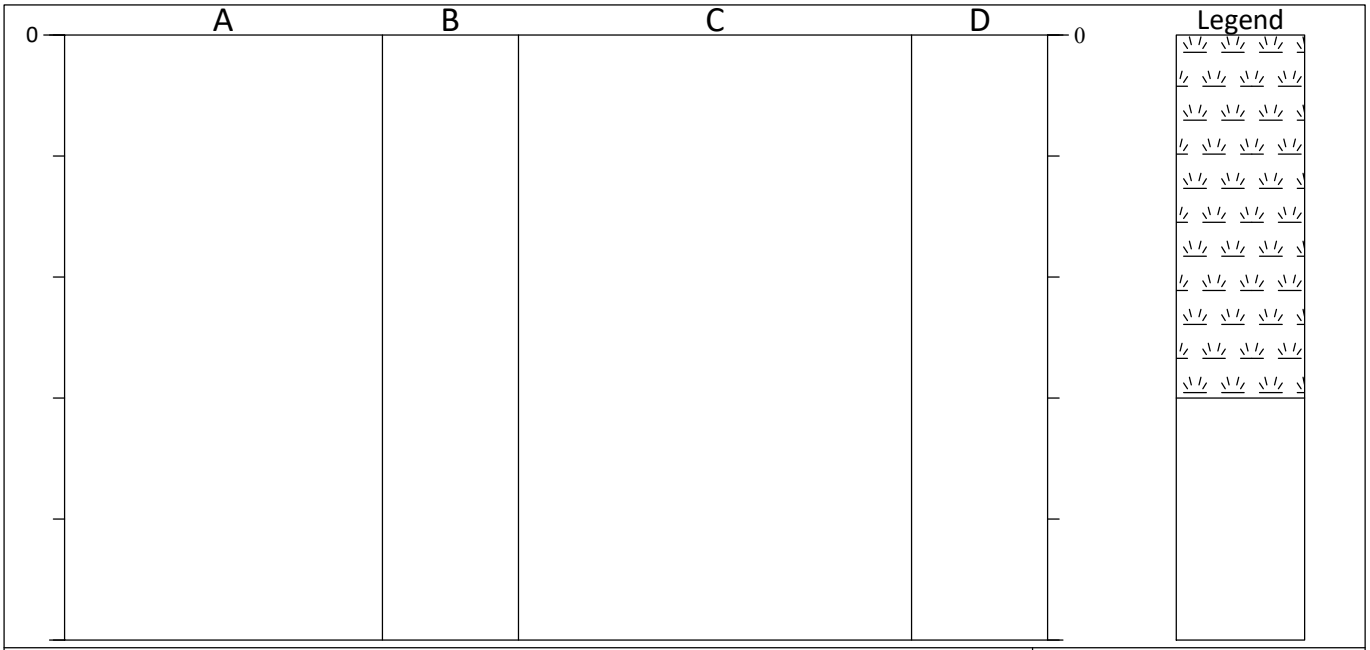
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

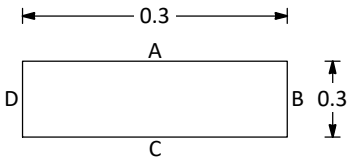
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP06B**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No Groundwater encountered. No visual or olfactory signs of contamination.

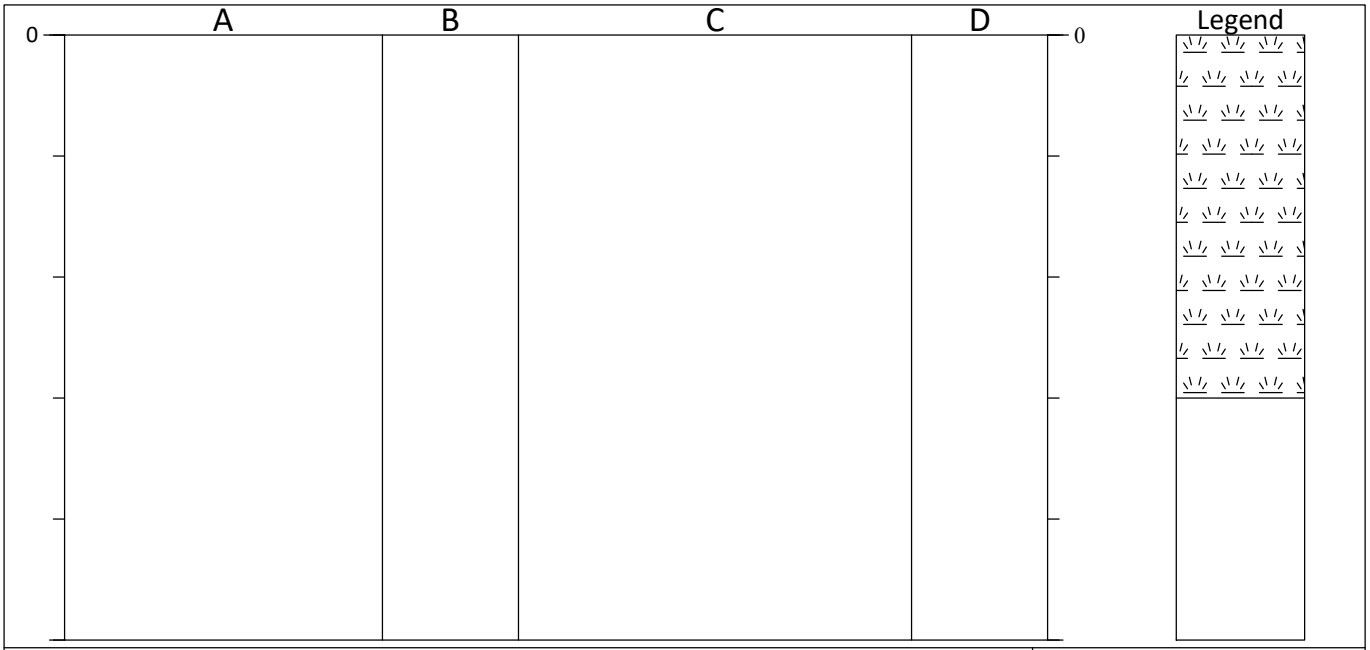
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

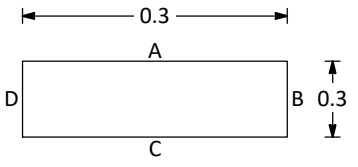
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				TP06C
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

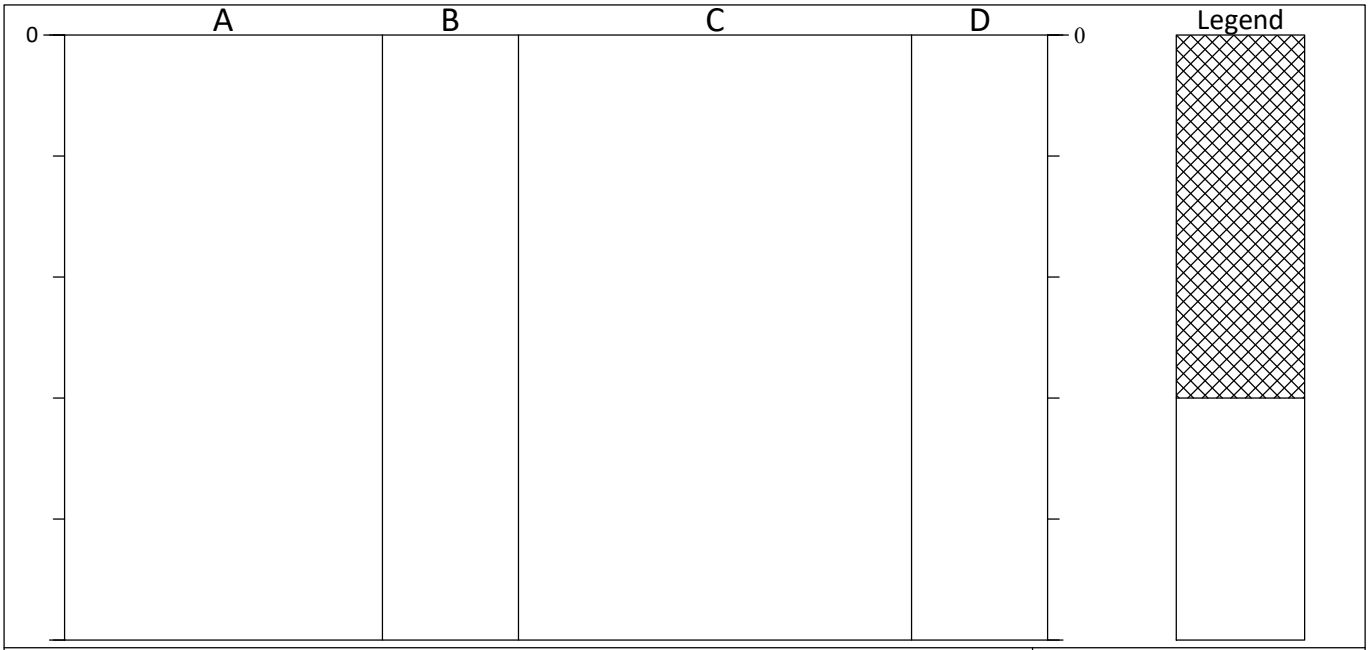
Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

FWS Environmental & Geological Consultants

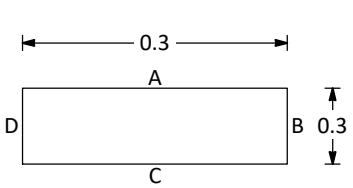
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP06D**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone mudstone and rare glass with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

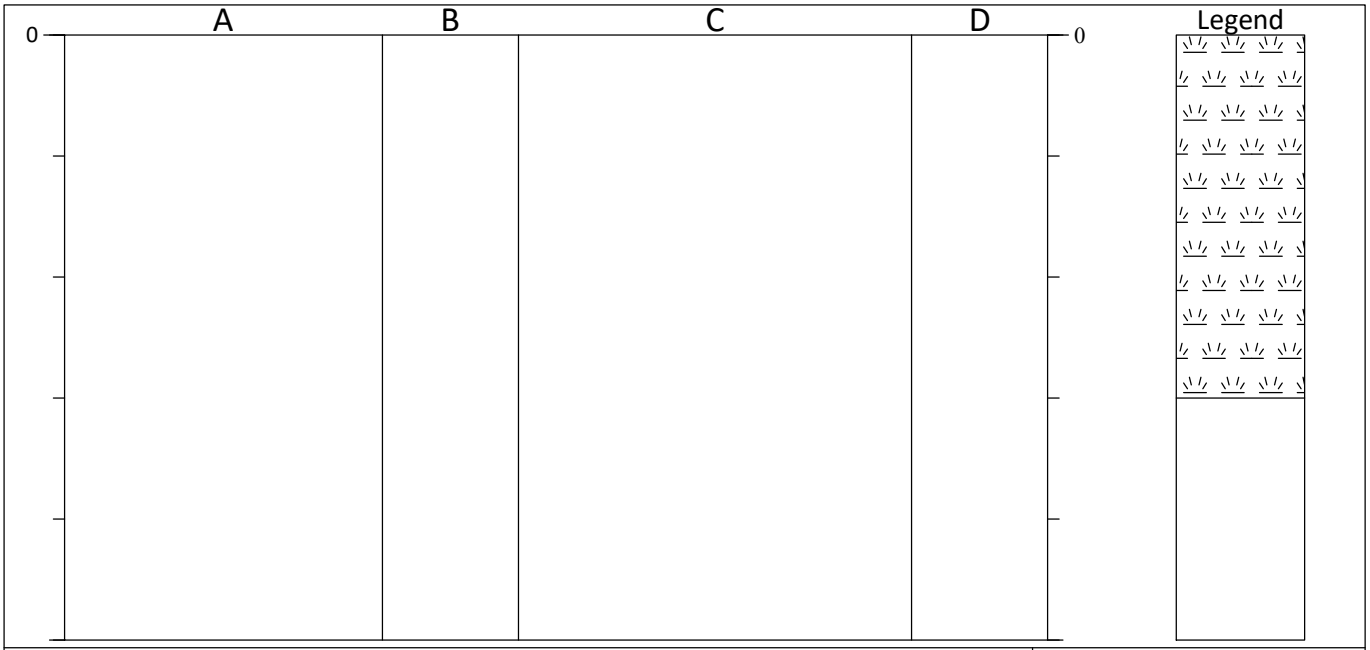
All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

FWS Environmental & Geological Consultants

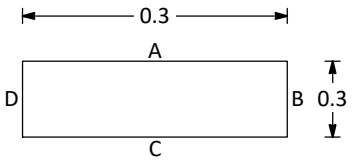
TRIAL PIT LOG

Project				TRIAL PIT No
Rowley Lane, Lepton				**TP06E**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
3959	13-10-23			
Contractor				Sheet
GeoSpek				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		Grass covered soft dark brown sandy gravelly clay TOPSOIL. Gravel is fine to medium subangular of sandstone and mudstone with occasional rootlets.	0.20	E	
0.30		End of hand dug pit.			

Shoring/Support: None used
Stability: Stable



GENERAL REMARKS

Hand dug pit to 0.30 m. No groundwater encountered. No visual or olfactory signs of contamination.

All dimensions in metres Scale 1:6.25	Client KDC Development Ltd	Method/ Plant Used Hand dug.	Logged By JR

AGS3 UK TP NEW 3959 - LOGS.GPJ AGS3_ALL.GDT 07/11/23

APPENDIX 3

MONITORING CERTIFICATES

FWS

GAS AND GROUNDWATER MONITORING
3959 - Lepton

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		PID Reading	Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	ppm	m bgl	m bgl	m bgl	
WS1	8/3/22	11:10	JG	995	15.0, 7.0, <0.1	<0.1	<0.1	0.2	0.2	20.3	20.3	NR	1.76	3.00	1.0 – 3.0	Glacial Till and mudstone
	25/3/22	12:15	JG	1017	7.3, 2.0, <0.1	<0.1	<0.1	3.7	3.7	18.1	18.1	NR	1.02	3.00		
	13/5/22	11:10	JG	999	Unable to monitor on this visit – bung sunk in hole and chamber flooded.											
	26/05/2022	11:40	JG/JR	Field has been ploughed – Borehole destroyed/unable to find.												
WS2	8/3/22	11:00	JG	995	4.5, <0.1	<0.1	<0.1	0.1	0.1	20.5	20.5	NR	2.67	3.00	1.0 – 3.0	Glacial Till, sand and mudstone
	25/3/22	12:09	JG	1017	1.8, <0.1	<0.1	<0.1	3.6	3.6	17.5	17.5	NR	1.19	3.00		
	13/5/22	11:05	JG	999	<0.1	<0.1	<0.1	5.2	5.2	14.6	14.6	NR	UTR	UTR		
	26/05/2022	12:02	JG/JR	1000	<0.1	<0.1	<0.1	0.2	0.2	21.4	21.4	NR	1.34	2.95		
WS4	8/3/22	11:20	JG	995	10.0, <0.1	<0.1	<0.1	0.2	0.2	20.2	20.2	NR	2.04	2.60	1.0 – 2.7	Glacial Till and mudstone
	25/3/22	12:25	JG	1017	4.2, <0.1	<0.1	<0.1	3.4	3.4	17.8	17.8	NR	1.24	2.60		
	13/5/22	11:15	JG	999	2.1, <0.1	<0.1	<0.1	4.9	4.9	14.3	14.3	NR	1.24	2.52		
	26/05/2022	11:45	JG/JR	Field has been ploughed – Borehole destroyed/unable to find.												
WS6	8/3/22	11:35	JG	995	4.5, <0.1	<0.1	<0.1	0.5	0.5	20.2	20.2	NR	2.11	3.00	1.0 – 3.0	Glacial Till, coal and mudstone
	25/3/22	12:46	JG	1017	<0.1	<0.1	<0.1	2.6	2.6	17.3	17.3	NR	0.76	3.00		
	13/5/22	11:35	JG	999	Field has been ploughed – Borehole destroyed.											

FWS

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		PID Reading	Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	m bgl	m bgl	m bgl	m bgl	
WS6	26/05/2022	11:50	JG/JR	Field has been ploughed – Borehole destroyed/unable to find.												
WS10	8/3/22	11:27	JG	995	<0.1	<0.1	<0.1	1.5	1.5	18.0	18.0	NR	DRY	1.75	1.0 – 1.9	Glacial Till and sandstone
	25/3/22	12:36	JG	1017	<0.1	<0.1	<0.1	1.6	1.6	17.5	17.5	NR	DRY	1.75		
	13/5/22	11:30	JG	999	0.1	<0.1	<0.1	2.1	2.1	19.9	19.9	NR	DRY	1.65		
	26/05/2022	11:55	JG/JR	Field has been ploughed – Borehole destroyed/unable to find.												

WEATHER CONDITIONS

Date	Cloud	Weather	Wind	Temperature °C	Atmospheric Pressure
8/3/22	0/8 clear	Clear	Strong Breeze	5	
25/3/22	0/8	Clear	Calm	18	1017
13/5/22	6/8	Overcast	Strong Breeze	15	999
26/05/2022	8/8	drizzle	Strong Breeze	15	1000

Notes

1. Geotechnical Instruments Infra-Red Landfill Monitor (GA5000) with internal flow
2. Gas sample type – accumulated
3. Average gas flow taken of 60 Seconds
4. Weather data obtained from – http://www.metoffice.gov.uk/weather
5. Detection limits – 0.1% CH_4, CO_2, and O_2, 0.1 l/hr flow rate

GAS AND GROUNDWATER MONITORING
3959 - Lepton

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	m bgl	m bgl	m bgl	
WS01-2023	09/11/2023	08:56	JR[6]	979	<0.1(-4.7)	<0.1	<0.1	0.4	0.4	21.2	21.2	0.30[6]	2.80	1.0 – 3.0	Mudstone
	22/11/2023	11:20	JR[7]	1010	<0.1	<0.1	<0.1	0.7	0.7	20.5	20.5	0.25[7]	2.80		
	06/12/2023	11:36	JR[8]	1002	<0.1	<0.1	<0.1	0.8	0.8	21.0	21.0	0.30[8]	2.80		
	20/12/2023	12:45	HD/AF	997	0.4	0.1	0.1	3.3	3.3	11.2	11.2	0.41[8]	2.80		
	04/01/2024	11:40	HD/JR	984	x	x	x	x	x	x	x	0.25[8]	2.80		
	18/01/2024	10:40	HD/JR	991	x	x	x	x	x	x	x	0.20[8]	2.80		
WS02-2023	09/11/2023	08:36	JR	979	0.2	<0.1	<0.1	8.1	8.1	15.6	15.6	1.44	3.08	1.0 – 3.0	Glacial Till, mudstone and coal
	22/11/2023	11:45	JR	1010	0.1	<0.1	<0.1	7.2	7.2	17.0	17.0	1.24	3.06		
	06/12/2023	12:02	JR	1002	0.1	<0.1	<0.1	7.5	7.5	18.0	18.0	1.17	3.07		
	20/12/2023	12:38	HD/AF	997	0.0	0.2	0.2	7.7	7.7	13.1	13.1	1.89	3.09		
	04/01/2024	11:32	HD/JR	984	-0.5	0.3	0.3	8.1	8.1	12.9	12.9	1.45	3.06		
	18/01/2024	10:00	HD/JR	991	<0.1	<0.1	<0.1	6.7	6.7	14.5	14.5	1.83	3.09		
WS04-2023	09/11/2023	10:10	JR	979	0.3	<0.1	<0.1	4.9	4.9	12.8	12.8	1.96	2.13	1.0 – 2.1	Glacial Till and mudstone
	22/11/2023	12:00	JR	1010	0.2	<0.1	<0.1	4.0	4.0	14.0	14.0	1.70	2.12		
	06/12/2023	12:17	JR	1002	0.2	<0.1	<0.1	3.6	3.6	14.7	14.7	1.60	2.12		
	20/12/2023	13:00	HD/AF	997	0.0	0.1	0.1	6.1	6.1	11	11	damp	2.12		
	04/01/2024	11:55	HD/JR	984	0.1	0.3	0.3	6.7	6.7	10.8	10.8	1.98	2.10		
	18/01/2024	10:17	HD/JR	991	0.1	<0.1	<0.1	6.6	6.6	10.9	10.9	Damp	2.12		
WS06-2023	09/11/2023	09:58	JR	979	3.2	<0.1	<0.1	1.8	1.8	21.3	21.3	0.00[6]	2.95	1.0 – 3.0	Glacial Till and mudstone
	22/11/2023	12:15	JR	1010	2.5	<0.1	<0.1	1.4	1.4	20.3	20.3	0.00[7]	2.96		
	06/12/2023	12:34	JR	1002	3.0	<0.1	<0.1	1.2	1.2	21.0	21.0	0.00[8]	2.96		
	20/12/2023	13:28	HD/AF	997	0.7	0.1	0.1	0.7	0.7	21.5	21.5	0.00	2.89		
	04/01/2024	12:05	HD/JR	984	0.2	0.3	0.3	0.6	0.6	21.1	21.1	0.00	2.82		
	18/01/2024	10:25	HD/JR	991	3.0	<0.1	<0.1	0.6	0.6	21.5	21.5	0.00	2.80		

BH	Date	Time	Tested By	Atmospheric Pressure	Flow Rate	Methane		Carbon Dioxide		Oxygen		Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
				mbar	Average l/hr	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	Peak % V/V	Steady % V/V	m bgl	m bgl	m bgl	
WS10-2023	09/11/2023	09:40	JR	979	0.2	<0.1	<0.1	4.0	4.0	17.0	17.0	Damp	1.92	1.0 – 1.9	Glacial Till and sandstone
	22/11/2023	12:30	JR	1010	0.2	<0.1	<0.1	3.8	3.8	17.9	17.9	Damp	1.91		
	06/12/2023	12:50	JR	1002	0.2	<0.1	<0.1	3.0	3.0	18.8	18.8	Damp	1.91		
	20/12/2023	13:34	HD/AF	997	0.0	0.1	0.1	4.3	4.3	19.4	19.4	Damp	2.2		
	04/01/2024	12:15	HD/JR	984	<0.1	0.3	0.3	2.8	2.8	17.5	17.5	1.70	2.0		
	18/01/2024	10:33	HD/JR	991	<0.1	<0.1	<0.1	0.2	0.2	21.6	21.6	Damp	2.02		

WEATHER CONDITIONS

Date	Cloud	Weather	Wind	Temperature °C	Atmospheric Pressure
09/11/2023	4/8	Fair	Slight breeze	6	979 falling
22/11/2023	8/8	Drizzle	Windy	9	1010 falling
06/12/2023	0/8	Sunny	Slight breeze	2	1002 falling
20/12/2023	8/8	Drizzle	Slight breeze	9	997 falling
04/01/2024	5/8	fair	No wind	7	984 Rising
18/01/2024	0/8	Sunny	No Wind	-2	991 Rising

Notes

1. Geotechnical Instruments Infra-Red Landfill Monitor (GA5000) with internal flow.
2. Gas sample type – accumulated.
3. Average gas flow taken of 60 Seconds.
4. Weather data obtained from – http://www.metoffice.gov.uk/weather.
5. Detection limits – 0.1% CH_4, CO_2, and O_2, 0.1 l/hr flow rate.
6. WS1 – Test ran for 30 seconds before being aborted due to water. WS1 was bailed 20 times from 0.30 to 0.40 m bgl. WS6 was bailed 10 times from surface level to 1.40 m bgl.
7. WS1 – Test ran for 25 seconds before being aborted due to water. WS1 was bailed 20 times from 0.25 to 0.30 m bgl. WS6 was bailed 10 times from surface level to 1.70 m bgl.
8. instantaneous recharging after bailing.

APPENDIX 4

CHEMICAL ANALYSIS RESULTS

Certificate of Analysis

Certificate Number	22-04196	*Issued:*	10-Mar-22

Client FWS Consultants
Unit 2 City West Business Park
St Johns Road
Meadowfield Industrial Estate
Co Durham
DH7 8ER

Our Reference	22-04196
Client Reference	3959
Order No	(not supplied)
Contract Title	Rowley Lane, Lepton
Description	11 Soil samples.
Date Received	02-Mar-22
Date Started	02-Mar-22
Date Completed	10-Mar-22
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04196
Client Ref 3959
Contract Title Rowley Lane, Lepton

				Lab No	1978360	1978361	1978362	1978363	1978364	1978365
				.Sample ID	WS1	WS4	WS4	WS5	WS6	WS6
				Depth	0.50	0.20	1.80	0.50	0.10	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	23/02/2022	23/02/2022	23/02/2022	23/02/2022	24/02/2022	24/02/2022
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Preparation										
Moisture Content	DETSC 1004	0.1	%			16			23
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	12	44		6.8	18	
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2	0.6		0.2	0.5	
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.2		< 0.1	0.2	
Chromium	DETSC 2301#	0.15	mg/kg	29	25		17	17	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0	< 1.0	
Copper	DETSC 2301#	0.2	mg/kg	35	56		22	21	
Lead	DETSC 2301#	0.3	mg/kg	16	100		14	37	
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.19		< 0.05	0.06	
Nickel	DETSC 2301#	1	mg/kg	30	23		17	20	
Zinc	DETSC 2301#	1	mg/kg	71	77		43	64	
Inorganics										
pH	DETSC 2008#		pH	6.5	6.3	6.1	6.6	5.7	5.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.2		< 0.1	0.2	
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		< 0.1	< 0.1	
Organic matter	DETSC 2002#	0.1	%	3.2	4.0		1.0	3.2	
Chloride Aqueous Extract	DETSC 2055	1	mg/l	3.6	4.0		2.6	3.1	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	51	12	23	24	31	24
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	393	710	245	424	7470	329
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5		< 1.5	< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2		< 1.2	< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5		< 1.5	< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4		< 3.4	< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10	< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9		< 0.9	< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5		< 0.5	< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6		< 0.6	< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4		< 1.4	< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10	< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10	< 10	
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04196
Client Ref 3959
Contract Title Rowley Lane, Lepton

				Lab No	1978360	1978361	1978362	1978363	1978364	1978365
				.Sample ID	WS1	WS4	WS4	WS5	WS6	WS6
				Depth	0.50	0.20	1.80	0.50	0.10	0.50
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	23/02/2022	23/02/2022	23/02/2022	23/02/2022	24/02/2022	24/02/2022
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
MTBE	DETSC 3321	0.01	mg/kg		< 0.01	< 0.01		< 0.01	< 0.01	
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg		< 0.03	0.06		< 0.03	0.05	
Anthracene	DETSC 3303	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	0.04		< 0.03	0.10	
Pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	0.04		< 0.03	0.09	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg		0.04	0.06		0.05	0.09	
Chrysene	DETSC 3303	0.03	mg/kg		0.04	< 0.03		0.04	0.04	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	0.04	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg		< 0.03	< 0.03		< 0.03	< 0.03	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg		< 0.10	0.17		< 0.10	0.41	
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		0.5	0.7		< 0.3	< 0.3	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04196
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978366	1978367	1978368	1978369	1978370
			.Sample ID	WS7	WS8	WS9	WS10	WS10
			Depth	0.50	1.25	0.50	0.10	0.50
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	23/02/2022	24/02/2022	24/02/2022	24/02/2022	24/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Preparation								
Moisture Content	DETSC 1004	0.1	%		13			
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	4.4		4.2	8.6	3.1
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2		< 0.2	0.3	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1		< 0.1	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17		18	16	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24		45	22	13
Lead	DETSC 2301#	0.3	mg/kg	11		20	35	14
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05		< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	23		11	16	16
Zinc	DETSC 2301#	1	mg/kg	54		49	76	58
Inorganics								
pH	DETSC 2008#		pH	6.4	5.6	5.2	5.2	6.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1	0.2	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1	0.2	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.5		0.5	3.1	0.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	2.1		1.6	5.4	2.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	10	12	< 10	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	460	121	335	475	117
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2		< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4		< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9		< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5		< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6		< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4		< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10		< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04196
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978366	1978367	1978368	1978369	1978370
			.Sample ID	WS7	WS8	WS9	WS10	WS10
			Depth	0.50	1.25	0.50	0.10	0.50
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	23/02/2022	24/02/2022	24/02/2022	24/02/2022	24/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01		< 0.01	< 0.01	< 0.01
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	0.04	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	0.09	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	0.08	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04		0.05	0.08	0.04
Chrysene	DETSC 3303	0.03	mg/kg	0.03		0.04	0.04	0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	0.05	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10		< 0.10	0.34	< 0.10
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3		< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-04196
Client Ref 3959
Contract Title Rowley Lane, Lepton

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1978361	WS4 0.20	SOIL	NAD	none	Michael Kay
1978364	WS6 0.10	SOIL	NAD	none	Michael Kay
1978369	WS10 0.10	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 22-04196
Client Ref 3959
Contract Rowley Lane, Lepton

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1978360	WS1 0.50 SOIL	23/02/22	GJ 250ml, PT 1L		
1978361	WS4 0.20 SOIL	23/02/22	GJ 250ml, PT 1L		
1978362	WS4 1.80 SOIL	23/02/22	GJ 250ml, PT 1L		
1978363	WS5 0.50 SOIL	23/02/22	GJ 250ml, PT 1L		
1978364	WS6 0.10 SOIL	24/02/22	GJ 250ml, PT 1L		
1978365	WS6 0.50 SOIL	24/02/22	GJ 250ml, PT 1L		
1978366	WS7 0.50 SOIL	23/02/22	GJ 250ml, PT 1L		
1978367	WS8 1.25 SOIL	24/02/22	GJ 250ml, PT 1L		
1978368	WS9 0.50 SOIL	24/02/22	GJ 250ml, PT 1L		
1978369	WS10 0.10 SOIL	24/02/22	GJ 250ml, PT 1L		
1978370	WS10 0.50 SOIL	24/02/22	GJ 250ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	22-04198	*Issued:*	10-Mar-22

Client FWS Consultants
Unit 2 City West Business Park
St Johns Road
Meadowfield Industrial Estate
Co Durham
DH7 8ER

Our Reference	22-04198
Client Reference	3959
Order No	(not supplied)
Contract Title	Rowley Lane, Lepton
Description	11 Soil samples.
Date Received	02-Mar-22
Date Started	02-Mar-22
Date Completed	10-Mar-22
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 22-04198
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978372	1978373	1978374	1978375	1978376	1978377
			.Sample ID	TP5	TP6	TP6	TP7	TP8	TP10
			Depth	0.50	0.20	1.60	0.70	0.60	0.10
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Preparation									
Moisture Content	DETSC 1004	0.1	%			20			
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	5.8	43		6.7	7.0	18
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2	0.6		< 0.2	< 0.2	0.5
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.3		< 0.1	< 0.1	0.3
Chromium	DETSC 2301#	0.15	mg/kg	19	26		24	20	23
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	27	73		28	17	40
Lead	DETSC 2301#	0.3	mg/kg	10	98		12	16	65
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.21		< 0.05	< 0.05	0.19
Nickel	DETSC 2301#	1	mg/kg	23	22		28	16	18
Zinc	DETSC 2301#	1	mg/kg	55	77		61	47	81
Inorganics									
pH	DETSC 2008#		pH	5.1	5.6	5.9	6.0	6.3	5.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.3		< 0.1	< 0.1	0.3
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.2		< 0.1	< 0.1	0.2
Organic matter	DETSC 2002#	0.1	%	0.6	5.6		0.7	0.7	3.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1.2	3.7		1.7	< 1.0	2.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	34	13	14	17	27	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1100	1090	254	203	305	658
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.5	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.2	< 1.2		< 1.2	< 1.2	< 1.2
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.5	< 1.5		< 1.5	< 1.5	< 1.5
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.4	< 3.4		< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10	< 10		< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.9	< 0.9		< 0.9	< 0.9	< 0.9
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	< 0.6	< 0.6		< 0.6	< 0.6	< 0.6
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.4	< 1.4		< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10	< 10		< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	< 10	< 10		< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04198
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978372	1978373	1978374	1978375	1978376	1978377
			.Sample ID	TP5	TP6	TP6	TP7	TP8	TP10
			Depth	0.50	0.20	1.60	0.70	0.60	0.10
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.07		< 0.03	< 0.03	0.06
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.11		< 0.03	< 0.03	0.09
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.10		< 0.03	< 0.03	0.08
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.28		< 0.10	< 0.10	0.23
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3		< 0.3	< 0.3	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04198
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978378	1978379	1978380	1978381	1978382
			.Sample ID	TP10	TP10	TP13	TP13	TP15
			Depth	0.70	1.80	0.70	2.10	0.50
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
Preparation								
Moisture Content	DETSC 1004	0.1	%		17		18	
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	5.0		7.2		7.3
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2		< 0.2		< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1		< 0.1		< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	19		24		22
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0		< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	27		35		34
Lead	DETSC 2301#	0.3	mg/kg	17		14		18
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05		< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	21		31		23
Zinc	DETSC 2301#	1	mg/kg	55		66		58
Inorganics								
pH	DETSC 2008#		pH	6.6	5.6	5.8	5.5	6.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1		< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1		< 0.1		< 0.1
Organic matter	DETSC 2002#	0.1	%	0.4		0.5		0.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1.9		1.8		1.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	< 10	10	22	18	23
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	247	202	325	330	364
Petroleum Hydrocarbons								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.5		< 1.5		< 1.5
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.2		< 1.2		< 1.2
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.5		< 1.5		< 1.5
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.4		< 3.4		< 3.4
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10		< 10		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.9		< 0.9		< 0.9
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.5		< 0.5		< 0.5
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	< 0.6		< 0.6		< 0.6
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.4		< 1.4		< 1.4
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10		< 10		< 10
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	< 10		< 10		< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01		< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04198
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978378	1978379	1978380	1978381	1978382
			.Sample ID	TP10	TP10	TP13	TP13	TP15
			Depth	0.70	1.80	0.70	2.10	0.50
			Other ID					
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	22/02/2022	22/02/2022	22/02/2022	22/02/2022	22/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01		< 0.01		< 0.01
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03		< 0.03		< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10		< 0.10		< 0.10
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3		< 0.3		< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-04198
Client Ref 3959
Contract Title Rowley Lane, Lepton

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1978373	TP6 0.20	SOIL	NAD	none	Michael Kay
1978377	TP10 0.10	SOIL	NAD	none	Michael Kay

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 22-04198
Client Ref 3959
Contract Rowley Lane, Lepton

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1978372	TP5 0.50 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978373	TP6 0.20 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978374	TP6 1.60 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978375	TP7 0.70 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978376	TP8 0.60 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978377	TP10 0.10 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978378	TP10 0.70 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978379	TP10 1.80 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978380	TP13 0.70 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978381	TP13 2.10 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978382	TP15 0.50 SOIL	22/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	22-04200	*Issued:*	09-Mar-22

Client FWS Consultants
Unit 2 City West Business Park
St Johns Road
Meadowfield Industrial Estate
Co Durham
DH7 8ER

Our Reference	22-04200
Client Reference	3959
Order No	(not supplied)
Contract Title	Rowley Lane, Lepton
Description	6 Soil samples.
Date Received	02-Mar-22
Date Started	02-Mar-22
Date Completed	09-Mar-22
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

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Summary of Chemical Analysis
Soil Samples

Our Ref 22-04200
Client Ref 3959
Contract Title Rowley Lane, Lepton

	Lab No	1978389	1978390	1978391	1978392	1978393	1978394
	.Sample ID	TP1	TP2	TP2	TP3	TP3	TP4
	Depth	0.70	0.30	1.90	0.05	1.70	0.50
	Other ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date	21/02/2022	21/02/2022	21/02/2022	21/02/2022	21/02/2022	21/02/2022
	Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**				
Preparation							
Moisture Content	DETSC 1004	0.1	%			7.3		17	
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	7.0	7.3		45		6.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	< 0.2	< 0.2		0.6		< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1		0.2		< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	22	24		22		22
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	32	29		420		32
Lead	DETSC 2301#	0.3	mg/kg	18	11		62		13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05		0.09		< 0.05
Nickel	DETSC 2301#	1	mg/kg	28	24		22		22
Zinc	DETSC 2301#	1	mg/kg	69	53		75		53
Inorganics									
pH	DETSC 2008#		pH	5.3	6.6	6.0	6.2	6.3	6.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		0.2		< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		0.1		< 0.1
Organic matter	DETSC 2002#	0.1	%	0.6	0.6		4.6		0.6
Chloride Aqueous Extract	DETSC 2055	1	mg/l	2.2	3.2		3.7		1.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	23	11	19	14	29	30
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	326	191	154	681	241	438
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5		< 1.5		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2		< 1.2		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5		< 1.5		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4		< 3.4		< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10		< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9		< 0.9		< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5		< 0.5		< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6		< 0.6		< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4		< 1.4		< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10		< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10		< 10		< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 22-04200
Client Ref 3959
Contract Title Rowley Lane, Lepton

			Lab No	1978389	1978390	1978391	1978392	1978393	1978394
			.Sample ID	TP1	TP2	TP2	TP3	TP3	TP4
			Depth	0.70	0.30	1.90	0.05	1.70	0.50
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	21/02/2022	21/02/2022	21/02/2022	21/02/2022	21/02/2022	21/02/2022
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01		< 0.01		< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.05		< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.10		< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.08		< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.04	0.05		0.08		0.04
Chrysene	DETSC 3303	0.03	mg/kg	0.03	0.03		0.04		0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.04		< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03		< 0.03		< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		< 0.03		< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10		0.31		< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3		< 0.3		< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 22-04200
Client Ref 3959
Contract Title Rowley Lane, Lepton

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1978392	TP3 0.05	SOIL	NAD	none	Rebecca Burgess

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 22-04200
Client Ref 3959
Contract Rowley Lane, Lepton

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1978389	TP1 0.70 SOIL	21/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978390	TP2 0.30 SOIL	21/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978391	TP2 1.90 SOIL	21/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978392	TP3 0.05 SOIL	21/02/22	PT 1L	pH + Conductivity (7 days)	Aliphatics/Aromatics, BTEX, Naphthalene, PAH MS
1978393	TP3 1.70 SOIL	21/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
1978394	TP4 0.50 SOIL	21/02/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

Certificate of Analysis

Certificate Number	23-24533	*Issued:*	30-Oct-23

Client FWS Consultants
Unit 2 City West Business Park
St Johns Road
Meadowfield Industrial Estate
Co Durham
DH7 8ER

Our Reference	23-24533
Client Reference	3959
Order No	2023/6583
Contract Title	Phase 1 Area, Off of Rowley Lane, Lepton
Description	27 Soil samples.
Date Received	17-Oct-23
Date Started	17-Oct-23
Date Completed	30-Oct-23
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Kirk Bridgewood
General Manager

2139

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

			Lab No	2248575	2248576	2248577	2248578	2248579	2248580
			.Sample ID	TP01A	TP01B	TP02A	TP02B	TP03A	TP03B
			Depth	0.20	0.20	0.20	0.20	0.20	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	30	37	37	40	35	29
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg					0.3	
Cadmium	DETSC 2301#	0.1	mg/kg					0.2	
Chromium	DETSC 2301#	0.15	mg/kg					24	
Chromium, Hexavalent	DETSC 2204*	1	mg/kg					< 1.0	
Copper	DETSC 2301#	0.2	mg/kg					86	
Lead	DETSC 2301#	0.3	mg/kg					64	
Mercury	DETSC 2325#	0.05	mg/kg					0.14	
Nickel	DETSC 2301#	1	mg/kg					28	
Selenium	DETSC 2301#	0.5	mg/kg					0.8	
Zinc	DETSC 2301#	1	mg/kg					95	
Inorganics									
pH	DETSC 2008#		pH					6.2	
Cyanide, Total	DETSC 2130#	0.1	mg/kg					0.4	
Cyanide, Free	DETSC 2130#	0.1	mg/kg					0.4	
Organic matter	DETSC 2002#	0.1	%					6.8	
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l					5.1	
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l					22	
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg					731	
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg					< 1.2	
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg					< 1.5	
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg					< 3.4	
Aliphatic C5-C35	DETSC 3072*	10	mg/kg					< 10	
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg					< 0.01	
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg					< 0.9	
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg					< 0.5	
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg					< 0.6	
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg					< 1.4	
Aromatic C5-C35	DETSC 3072*	10	mg/kg					< 10	
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg					< 10	
Benzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Ethylbenzene	DETSC 3321#	0.01	mg/kg					< 0.01	
Toluene	DETSC 3321#	0.01	mg/kg					< 0.01	
Xylene	DETSC 3321#	0.01	mg/kg					< 0.01	
MTBE	DETSC 3321	0.01	mg/kg					< 0.01	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

	Lab No	2248575	2248576	2248577	2248578	2248579	2248580
	.Sample ID	TP01A	TP01B	TP02A	TP02B	TP03A	TP03B
	Depth	0.20	0.20	0.20	0.20	0.20	0.20
	Other ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
	Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg					< 0.03	
Acenaphthylene	DETSC 3303#	0.03	mg/kg					< 0.03	
Acenaphthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Fluorene	DETSC 3303	0.03	mg/kg					< 0.03	
Phenanthrene	DETSC 3303#	0.03	mg/kg					0.09	
Anthracene	DETSC 3303	0.03	mg/kg					< 0.03	
Fluoranthene	DETSC 3303#	0.03	mg/kg					0.07	
Pyrene	DETSC 3303#	0.03	mg/kg					0.05	
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg					< 0.03	
Chrysene	DETSC 3303	0.03	mg/kg					< 0.03	
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg					< 0.03	
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg					< 0.03	
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg					< 0.03	
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg					< 0.03	
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg					0.21	
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg					0.5	

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

				Lab No	2248581	2248582	2248583	2248584	2248585	2248586
				.Sample ID	TP03C	TP03D	TP03E	TP06A	TP06B	TP06C
				Depth	0.20	0.20	0.20	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	33	30	33	42	39	29
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg				0.3		
Cadmium	DETSC 2301#	0.1	mg/kg				0.4		
Chromium	DETSC 2301#	0.15	mg/kg				26		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg				< 1.0		
Copper	DETSC 2301#	0.2	mg/kg				59		
Lead	DETSC 2301#	0.3	mg/kg				120		
Mercury	DETSC 2325#	0.05	mg/kg				0.21		
Nickel	DETSC 2301#	1	mg/kg				42		
Selenium	DETSC 2301#	0.5	mg/kg				1.3		
Zinc	DETSC 2301#	1	mg/kg				110		
Inorganics										
pH	DETSC 2008#		pH				5.7		
Cyanide, Total	DETSC 2130#	0.1	mg/kg				0.4		
Cyanide, Free	DETSC 2130#	0.1	mg/kg				0.3		
Organic matter	DETSC 2002#	0.1	%				4.5		
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l				1.5		
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l				25		
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg				845		
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg				< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				< 0.6		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg				< 10		
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg				< 10		
Benzene	DETSC 3321#	0.01	mg/kg				< 0.01		
Ethylbenzene	DETSC 3321#	0.01	mg/kg				< 0.01		
Toluene	DETSC 3321#	0.01	mg/kg				< 0.01		
Xylene	DETSC 3321#	0.01	mg/kg				< 0.01		
MTBE	DETSC 3321	0.01	mg/kg				< 0.01		

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

			Lab No	2248581	2248582	2248583	2248584	2248585	2248586
			.Sample ID	TP03C	TP03D	TP03E	TP06A	TP06B	TP06C
			Depth	0.20	0.20	0.20	0.20	0.20	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg				< 0.03		
Acenaphthylene	DETSC 3303#	0.03	mg/kg				< 0.03		
Acenaphthene	DETSC 3303#	0.03	mg/kg				< 0.03		
Fluorene	DETSC 3303	0.03	mg/kg				< 0.03		
Phenanthrene	DETSC 3303#	0.03	mg/kg				0.15		
Anthracene	DETSC 3303	0.03	mg/kg				0.04		
Fluoranthene	DETSC 3303#	0.03	mg/kg				0.29		
Pyrene	DETSC 3303#	0.03	mg/kg				0.25		
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg				0.08		
Chrysene	DETSC 3303	0.03	mg/kg				0.07		
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg				0.06		
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg				0.04		
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg				< 0.03		
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg				< 0.03		
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg				< 0.03		
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg				0.98		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg				0.5		

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Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

				Lab No	2248587	2248588	2248589	2248590	2248591	2248592
				.Sample ID	TP06D	TP06E	HDP01	HDP02	HDP03	HDP04
				Depth	0.20	0.20	0.20	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	32	31	21	23	31	26
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg			0.3	0.5	0.5	0.3
Cadmium	DETSC 2301#	0.1	mg/kg			0.2	0.2	0.3	0.2
Chromium	DETSC 2301#	0.15	mg/kg			20	20	24	16
Chromium, Hexavalent	DETSC 2204*	1	mg/kg			< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg			33	32	42	29
Lead	DETSC 2301#	0.3	mg/kg			66	93	88	86
Mercury	DETSC 2325#	0.05	mg/kg			0.10	0.09	0.15	0.09
Nickel	DETSC 2301#	1	mg/kg			22	17	23	15
Selenium	DETSC 2301#	0.5	mg/kg			0.5	< 0.5	0.6	0.7
Zinc	DETSC 2301#	1	mg/kg			110	85	100	62
Inorganics										
pH	DETSC 2008#		pH			6.6	6.2	6.0	6.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg			0.5	0.8	0.5	0.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg			0.3	0.5	0.4	0.4
Organic matter	DETSC 2002#	0.1	%			5.4	6.7	6.5	7.0
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l			3.6	2.3	3.9	12
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l			16	21	15	20
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg			740	1160	948	1260
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg			< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg			< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg			< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg			< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg			< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg			< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg			< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg			< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg			< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg			< 0.01	< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

				Lab No	2248587	2248588	2248589	2248590	2248591	2248592
				.Sample ID	TP06D	TP06E	HDP01	HDP02	HDP03	HDP04
				Depth	0.20	0.20	0.20	0.20	0.20	0.20
				Other ID						
				Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
				Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**							
PAHs										
Naphthalene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg			< 0.03	0.04	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg			0.06	0.07	0.03	0.04
Pyrene	DETSC 3303#	0.03	mg/kg			0.06	0.06	< 0.03	0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg			< 0.03	0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg			< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg			0.12	0.17	< 0.10	< 0.10
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			0.8	1.3	0.9	1.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

			Lab No	2248593	2248594	2248595	2248596	2248597	2248598
			.Sample ID	HDP05	WS04A	WS04B	WS04C	WS04D	WS04E
			Depth	0.20	0.20	0.20	0.20	0.20	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	17	32	28	11	22	24
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.5	0.5				
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.2				
Chromium	DETSC 2301#	0.15	mg/kg	16	24				
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0				
Copper	DETSC 2301#	0.2	mg/kg	26	75				
Lead	DETSC 2301#	0.3	mg/kg	85	190				
Mercury	DETSC 2325#	0.05	mg/kg	0.12	0.18				
Nickel	DETSC 2301#	1	mg/kg	14	19				
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.7				
Zinc	DETSC 2301#	1	mg/kg	70	80				
Inorganics									
pH	DETSC 2008#		pH	6.7	5.9				
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.5	0.5				
Cyanide, Free	DETSC 2130#	0.1	mg/kg	0.4	0.3				
Organic matter	DETSC 2002#	0.1	%	7.2	5.1				
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	3.0	2.7				
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	17	15				
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1240	764				
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2				
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5				
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4				
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10				
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01				
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9				
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5				
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6				
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4				
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10				
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10				
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01				
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

			Lab No	2248593	2248594	2248595	2248596	2248597	2248598
			.Sample ID	HDP05	WS04A	WS04B	WS04C	WS04D	WS04E
			Depth	0.20	0.20	0.20	0.20	0.20	0.20
			Other ID						
			Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Sampling Date	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023	13/10/2023
			Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**						
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03				
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03				
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03				
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03				
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10				
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.2	0.8				

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

	Lab No	2248599	2248600	2248601
	.Sample ID	WS11	WS12	WS13
	Depth	0.50	0.20	0.50
	Other ID			
	Sample Type	SOIL	SOIL	SOIL
	Sampling Date	13/10/2023	13/10/2023	13/10/2023
	Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**	
Metals				
Arsenic	DETSC 2301#	0.2	mg/kg	5.5	13	5.0
Boron, Water Soluble (2.5:1)	DETSC 2311#	0.2	mg/kg	0.2	0.5	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	17	17	27
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	21	13
Lead	DETSC 2301#	0.3	mg/kg	23	57	9.6
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.08	< 0.05
Nickel	DETSC 2301#	1	mg/kg	15	14	20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	40	66	50
Inorganics				
pH	DETSC 2008#		pH	5.4	5.8	6.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.6	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.4	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.0	5.5	0.4
Chloride Aqueous Extract (2:1)	DETSC 2055	1	mg/l	1.7	2.7	2.4
Sulphate Aqueous Extract as SO4 (2:1)	DETSC 2076#	10	mg/l	52	18	< 10
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	452	916	< 100
Petroleum Hydrocarbons				
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Chemical Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

			Lab No	2248599	2248600	2248601
			.Sample ID	WS11	WS12	WS13
			Depth	0.50	0.20	0.50
			Other ID			
			Sample Type	SOIL	SOIL	SOIL
			Sampling Date	13/10/2023	13/10/2023	13/10/2023
			Sampling Time	n/s	n/s	n/s
Test	**Method**	**LOD**	**Units**			
PAHs						
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.07	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.12	< 0.10
Phenols						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	1.1	< 0.3

Key: * -not accredited. # -MCERTS (accreditation only applies if report carries the MCERTS logo). n/s -not supplied.

Summary of Asbestos Analysis
Soil Samples

Our Ref 23-24533
Client Ref 3959
Contract Title Phase 1 Area, Off of Rowley Lane, Lepton

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2248579	TP03A 0.20	SOIL	NAD	none	Shannon Hope
2248584	TP06A 0.20	SOIL	NAD	none	Shannon Hope
2248589	HDP01 0.20	SOIL	NAD	none	Shannon Hope
2248590	HDP02 0.20	SOIL	NAD	none	Shannon Hope
2248591	HDP03 0.20	SOIL	NAD	none	Shannon Hope
2248592	HDP04 0.20	SOIL	NAD	none	Shannon Hope
2248593	HDP05 0.20	SOIL	NAD	none	Shannon Hope
2248594	WS04A 0.20	SOIL	NAD	none	Shannon Hope
2248599	WS11 0.50	SOIL	NAD	none	Shannon Hope
2248600	WS12 0.20	SOIL	NAD	none	Shannon Hope
2248601	WS13 0.50	SOIL	NAD	none	Shannon Hope

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 23-24533
Client Ref 3959
Contract Phase 1 Area, Off of Rowley Lane, Lepton

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2248575	TP01A 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248576	TP01B 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248577	TP02A 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248578	TP02B 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248579	TP03A 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248580	TP03B 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248581	TP03C 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248582	TP03D 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248583	TP03E 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248584	TP06A 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248585	TP06B 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248586	TP06C 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248587	TP06D 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248588	TP06E 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248589	HDP01 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248590	HDP02 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248591	HDP03 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248592	HDP04 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248593	HDP05 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248594	WS04A 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248595	WS04B 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248596	WS04C 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248597	WS04D 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248598	WS04E 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248599	WS11 0.50 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248600	WS12 0.20 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		
2248601	WS13 0.50 SOIL	13/10/23	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-
Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX 5

GROUND PROBING RADAR SURVEY

TERRAVISION
INTELLIGENT EXPLORATION

FWS Geotechnical & Environmental Consultants

FWS Consultants Ltd.
Terravision Exploration GPR*plus* – Rowley Lane Survey Report

Revision: 001
Job Number: 2202001
Reference: 2202001_TVX_RL
Author: CW
Date: 24 Feb 22

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REVISIONS

Revision	Description	Modifications	Date
0.0	First Draft	Report	24 Feb 22
1.0	Second Draft		
2.0	First Issue	Depths included	22 Mar 22
3.0	Second Issue		

AUTHORISATION

	Name	Position	Date
Created by	C Williams	CEO	24 Feb 22
Authorised by	C Williams	CEO	

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Contents

1 EXECUTIVE SUMMARY

Terravision Exploration Ltd (TVX) undertook a geophysical survey using Enhanced Ground Penetrating Radar (GPR*plus*)at the Rowley Lane Development site, Fenay Bridge, Huddersfield on 22 Feb 22.

The aim is to confirm the location of anticipated historical coal workings, specifically a series of underground roads and an Air Vent at approximately 9m bgl.

The TVX team attended site for one day and collected 11 profiles over 8 lines.

The geophysical horizons recorded in all profiles are caused by a change in the electrical properties of the sub-surface. These changes are interpreted to be the result of physical changes in the subsurface; perhaps changes in the compactness of the ground, changes in the lithology or the presence of voidal features.

The data confirms the transect of mapped voidal features anticipated to be as a result of historical mining. Also evident are more superficial linear features, possibly field drainage, and also some clear variations in the geology which may be of benefit.

Annex A provides images of each geophysical radargram / section.

2 INTRODUCTION

2.1 Aims

- The aim of the survey is to pick up old shallow mine workings; an air shaft along the western boundary and the associated roadway to the east. The anticipated depth of these workings is at least 9 m bgl. Along with some shallow workings in the east up to an outcrop position.

2.2 Location

Figure 2.1: Satellite image showing the location of the site SW of Huddersfield. (*Google Earth, 2022*).

3 GEOLOGY / LITHOLOGY

Unconfirmed at the time of survey.

4 REPORTING STANDARD

Terravision Exploration has processed the data using proprietary software to apply filters that best pick out the features of interest. This report provides Terravision Exploration's best interpretation of the data. As with all geophysical methodologies, it is not a finite science however every effort has been made to ensure the accuracy of this data.

Terravision Exploration states that they have no joint interest in the outcome of the survey.

5 UNDERSTANDING GPR*plus*™

5.1 About GPR*plus*™

GPR measures the signal strength of reflected electromagnetic pulses transmitted into the subsurface. A pulse is a travelling disturbance (of the electromagnetic field) in the sub-surface and is reflected at interfaces between contrasting mediums. As such GPR is often used to identify material changes not visible at surface. GPR*plus*™ is a ground scanning device that can image the subsurface at depths of a few mew metres up to 200 metres. Terravision's systems can achieve this because they utilise low frequency signals and have a large dynamic range.

Dynamic range is the currency of penetration: the more you have the deeper you can see. Traditional GPR units typically have a dynamic range of c. 96dB, after signal amplification and pre-processing of the received signal. They often operate at significantly higher centre frequencies meaning that they spend more energy per metre of penetration. GPR*plus*™ systems have a dynamic range of c. 126dB.

5.2 How else is GPR*plus*™ different?

Traditional GPR units typically have a bandwidth that is 100% of the given centre frequency i.e. an antenna with a centre frequency of 500 MHz is sampling frequencies between 250 – 750 MHz. GPR*plus*™ systems have a much greater bandwidth than traditional units. This means GPR*plus*™ is capable of capturing the same data as traditional GPR units as well as capturing responses from a much greater depth.

You might hear about other systems reducing their signal to noise ratio (SNR) through methods such as hyper stacking. While this may achieve results in environments with low ambient background noise, it does not work in areas where the noise floor is high. GPR*plus*™ overcomes this challenge by using signals that have a higher strength than most traditional GPR units. This means GPR*plus*™ gets results in environments often considered too difficult for traditional GPR units.

5.3 Customisable GPR*plus*™ solutions

One of the greatest benefits of GPR*plus* is that is not a fixed system, it is made up of a series of interchangeable parts. Terravision is able to select the right parts to assemble the optimal solution for a given problem. The analogy to make is that traditional GPR units are like set wrenches: each system is designed for one particular nut. The problem is, GPR technology is expensive and no one has all the wrench sizes needed for a particular project. Therefore, they make the most of the tool they do have, often at the expense of the client. GPR*plus*™ is like an adjustable wrench, it can be adjusted to best fit every nut on site.

5.4 GPR*plus*™Data

Terravision Exploration Ltd can present GPR*plus*™ data in three different ways. Each display has its own benefits and purpose.

5.4.1 Reflection Profiling

A reflection profile is the most common method of displaying GPR data and is often used to provide greater resolution of the subsurface. A reflection profiles displays the reflections generated at the interface between mediums of varying dielectric permittivity. Dielectric permittivity is a measure of a material's capacitance as well as the amount of charge needed to generate an electric flux. That is to say, the most influential geological properties for a GPR response are a material's density, microscopic water content and magnetic permeability.

Materials that have a similar dielectric permittivity have a low "dielectric contrast" between them. This makes it hard to differentiate them when visualising the data because the profile is constructed according to an amplitude scale. Mediums that share similar properties share a similar colour and response in the profile. Therefore, GPR is most successful in delineating objects that have medium/strong differences in their electromagnetic permeability.

Overall, the geophysical horizons recorded in all profiles are caused by a change in the electrical properties of the sub-surface. It is understood for this area the horizons are relatively consistent (with some general trends across the zones). These changes are interpreted to be the result of physical changes in the subsurface; perhaps changes in the compactness of the ground or changes in the lithology. By concentrating our attention on these planar (horizontal) reflections in the signal, we may observe evidence for contrasting geological layers from which we can infer the location of gypsum seams.

6 PROJECT SCOPE

Prolife lines were set out to investigate the historic workings that were anticipated in the area (Fig. 6.2 & Fig. 6.3). Profile design was set out to cross the roads perpendicularly to give the sharpest contrast with the surrounding material. Depths were anticipated to be over 9m bgl.

Figure 6.1: Image showing the Zone 1 outline and anticipated historical workings (FWS 2022).

Figure 6.2: Image showing the Zone 2 outline and historical workings (FWS 2022).

Figure 6.3: Image showing the survey line locations.

6.1 Profile Pathway

As seen in Figure 6.3, profile lines are orientated N-S, W-E. Readings were taken approximately every 0.20m.

Profile Line	Length (m)	Orientation
RL01	51.3	N-S
RL02	59.5	N-S
RL03	78.5	N-S
RL04A	69.2	N-S
RL04B	37.7	N-S
RL04C	59.0	N-S
RL05	40.4	N-S
RL06	41.4	N-S
RL07	44.7	N-S
RL08 (Air Shaft)	53.4	N-S

Table 6.1: Profile line details

7 Summary

The key findings are as follows:

1. All the anticipated underground workings historically mapped have been located. Figure 7.1 and 7.2 show Zones 1 and 2 with survey lines and the surface location of the interpreted features. Road structures are indicated by green markers, pipe/drainage features are indicated by red markers, features related to the air shaft are indicated by yellow markers and other points of interest are indicated by blue markers. It is noted that only overlay images of their potential location were provided and not in a preferred shape file, or other format ensuring GIS accuracy. There are slight variations on the locations of the underground workings as mapped for some of the locations. The locations are provided as a .kmz file in addition to this report.

2. Other variations that are potentially of interest to the client as also noted. These include a clear narrow linear feature in Zone 2, potentially a field drainage system. There was no evidence of a pipeline to the E or W of the open field areas along the extensions of this feature.

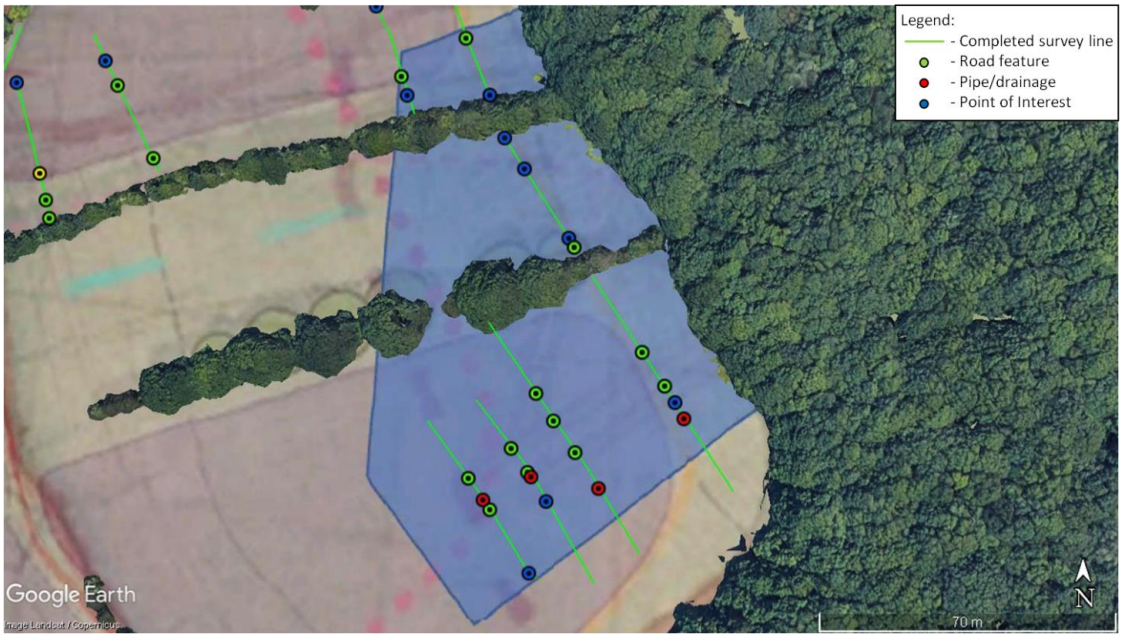


Fig 7.1: Surface locations of anticipated underground features and other POI within Zone 1

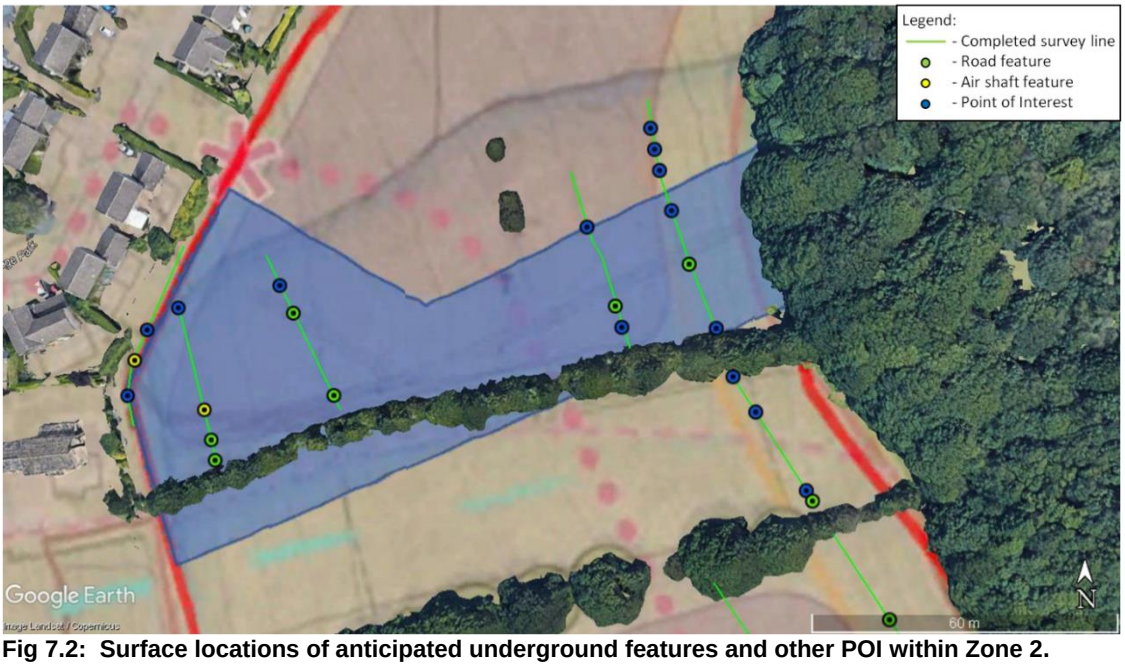


Fig 7.2: Surface locations of anticipated underground features and other POI within Zone 2.

7.1 Features

Table 7.1 and 7.2 are summary tables of the features identified within the GPR*plus* radargrams, listing the survey line the features are seen on, the type of feature, the depth of the feature and where applicable, the width of the feature. In all cases features are listed from north to south. For the corresponding radargrams please consult Annex A.

Profile Line	Feature	Depth (m)	Width (m)
RL01	Road	8	4
RL01	Pipe/drainage	5	-
RL01	Road	9	4
RL01	Point of Interest	6	-
RL02	Road	10	4
RL02	Road	10	-
RL02	Pipe/drainage	5	-
RL02	Point of Interest	9	-
RL03	Road	9	6
RL03	Road	8.5	3.5
RL03	Road	6	3
RL03	Pipe/drainage	5	-
RL04A	Road	6.5	3.5
RL04A	Road	7	4
RL04A	Point of Interest	7	-
RL04A	Pipe/drainage	4	-
RL04B	Point of Interest	10.5	-
RL04B	Point of Interest	11	-
RL04B	Point of Interest	15	-
RL04B	Road	7	2

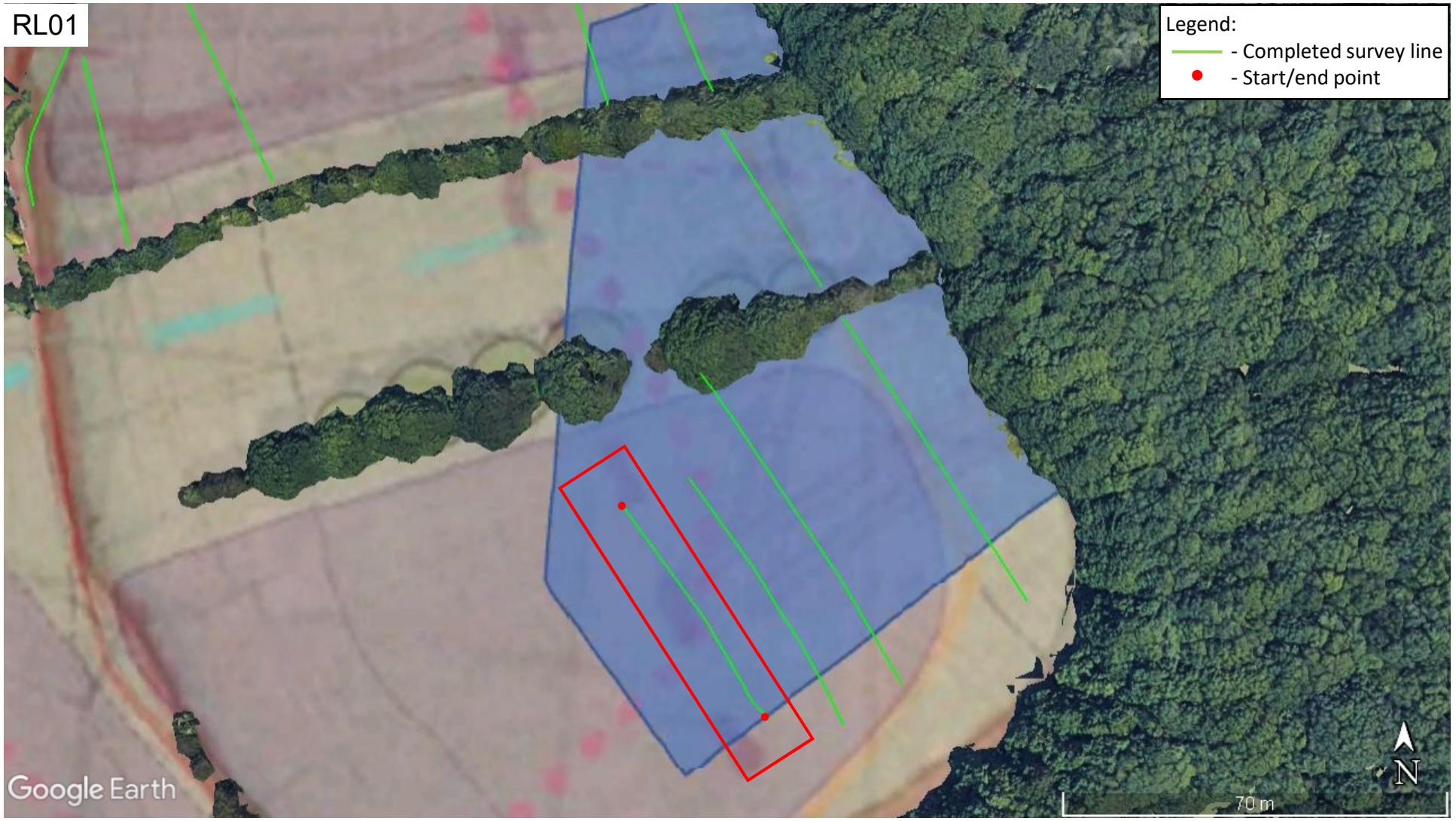
Table 7.1: Summary table of features identified in Zone 1.

Profile Line	Feature	Depth (m)	Width (m)
RL04C	Point of Interest	5	-
RL04C	Point of Interest	5	-
RL04C	Point of Interest	5	-
RL04C	Point of Interest	18	-
RL04C	Road	10	4
RL04C	Point of Interest	6	-
RL05	Point of Interest	5	-
RL05	Air shaft structure	7	-
RL05	Road	6	-
RL05	Road	6	-
RL06	Point of Interest	8	-
RL06	Road	7.5	3
RL06	Road	6	3
RL07	Point of Interest	6.5	3
RL07	Road	6.5	3
RL07	Point of Interest	6.5	-
RL08	Point of Interest	12	-
RL08	Air shaft	8	2.5
RL08	Point of Interest	7.5	-

Table 7.2: Summary table of features identified in Zone 2.

8 ANNEX A – Data Images

Rowley Lane Survey Area

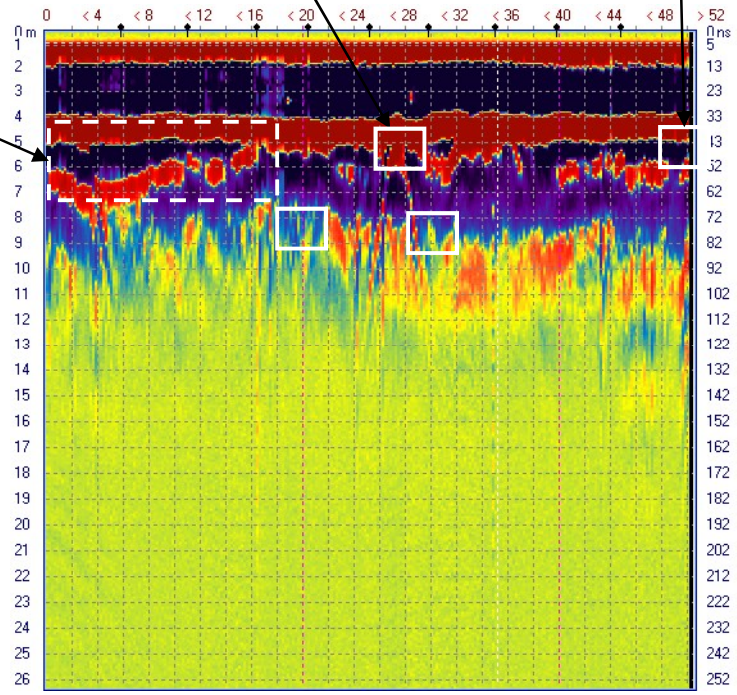

RL01
Legend:
- Completed survey line
- Start/end point
Google Earth
70 m
N

RL01

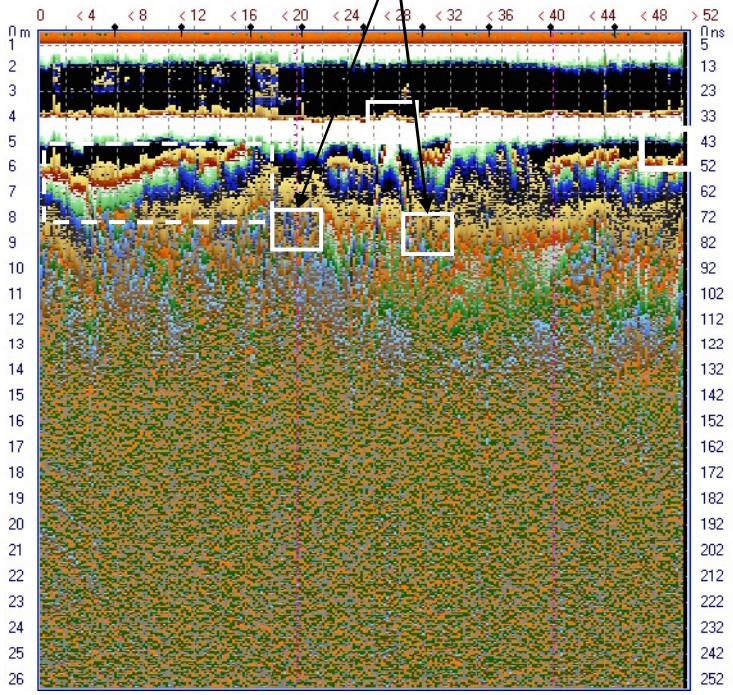
Zone of interest

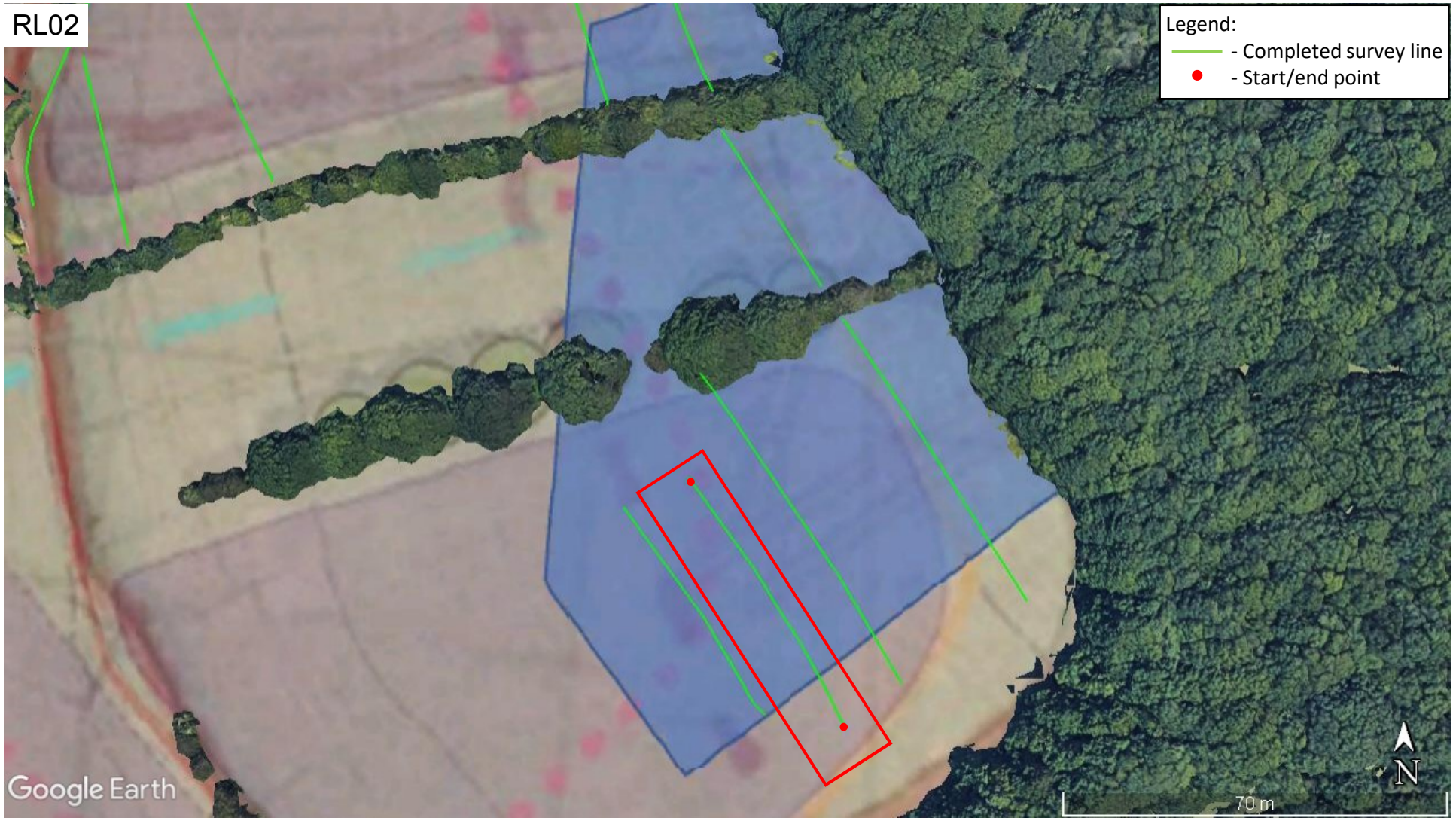
Hyperbola – possible drainage system.

Geological feature dipping to north



Possible feint signature of road feature continuation, area of profile is just beyond given tracks. However possible minor positional inaccuracy or lateral proximity of the voidal feature.




RL02
Legend:
- Completed survey line
- Start/end point
Google Earth
70 m
N

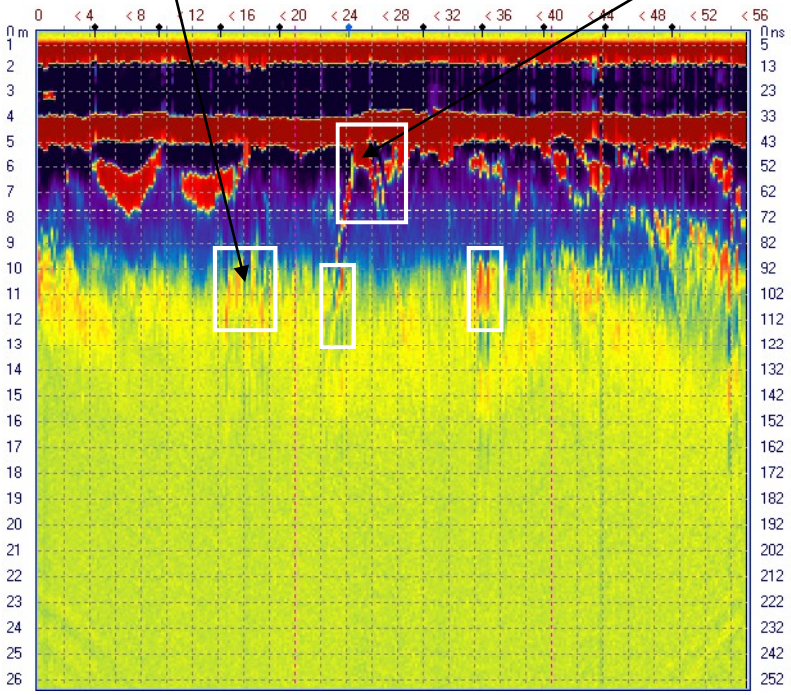
RL02

Intersecting road structures

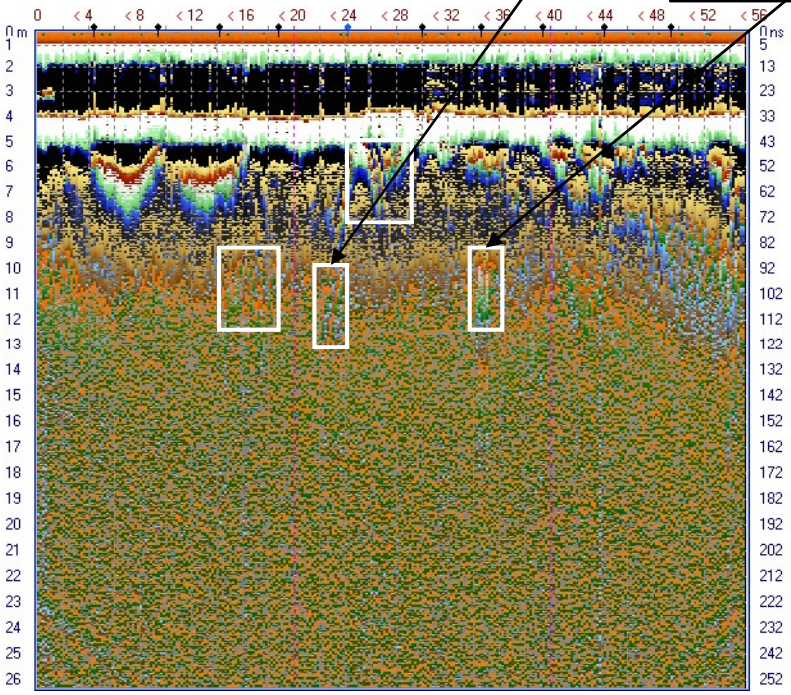
Hyperbola – possible drainage system, masking signature of road structure beneath

Roads not as clear in this section. One site potentially masked by hyperbolic response closer to surface (24m along section.)

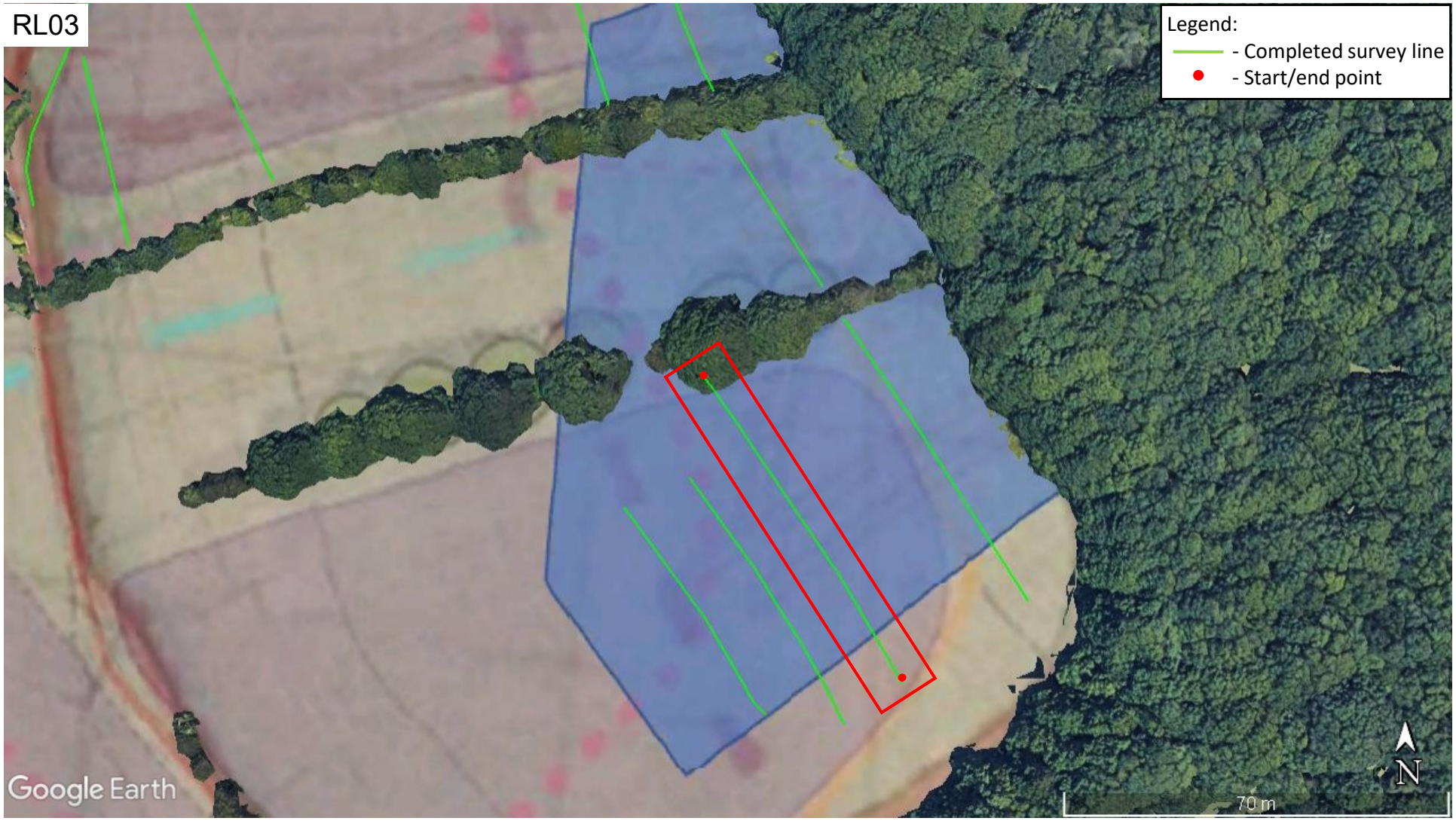
Zone of interest



N



S

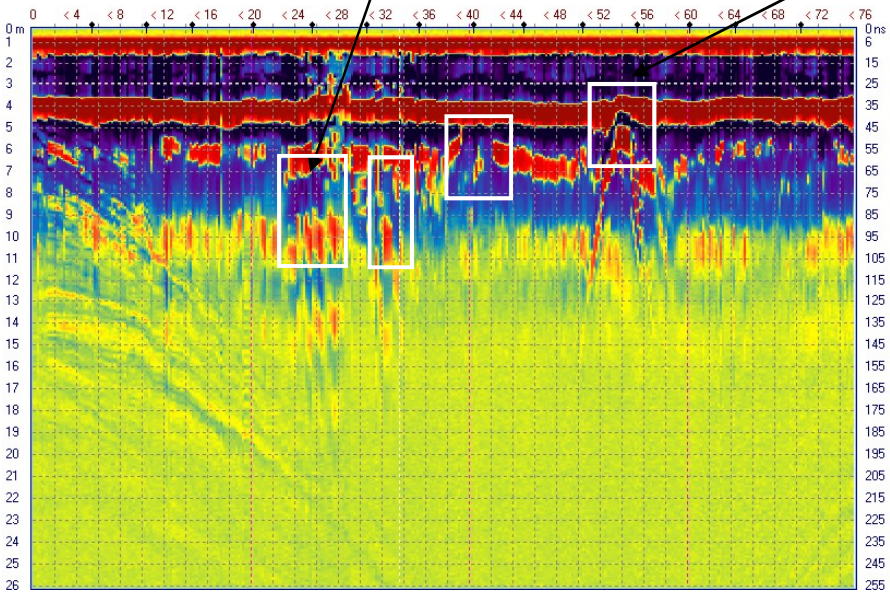

RL03
Legend:
- Completed survey line
- Start/end point
Google Earth
70 m
N

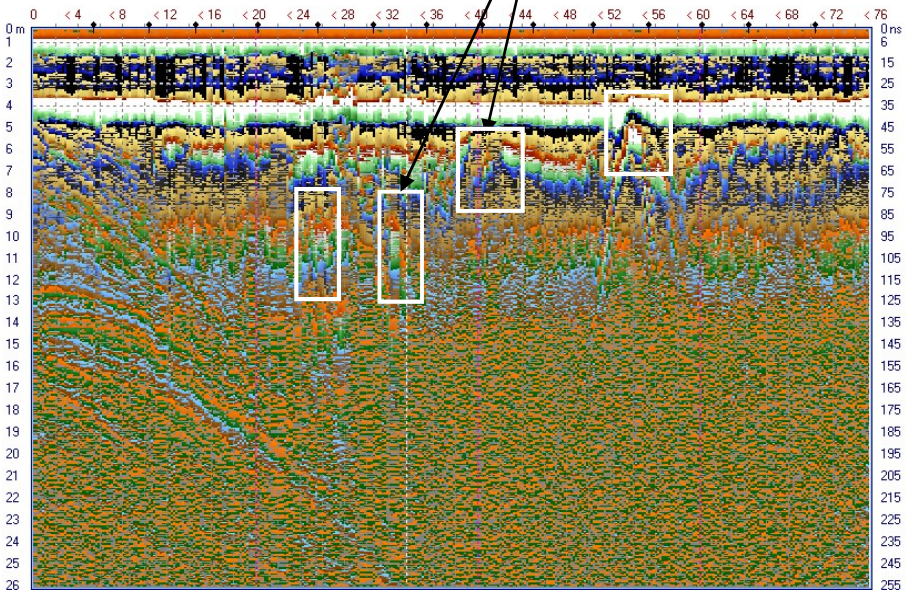
RL03

Diagonal road structure hit obliquely, appears wider than perpendicular road structure to south

Hyperbola of possible drainage or pipe.

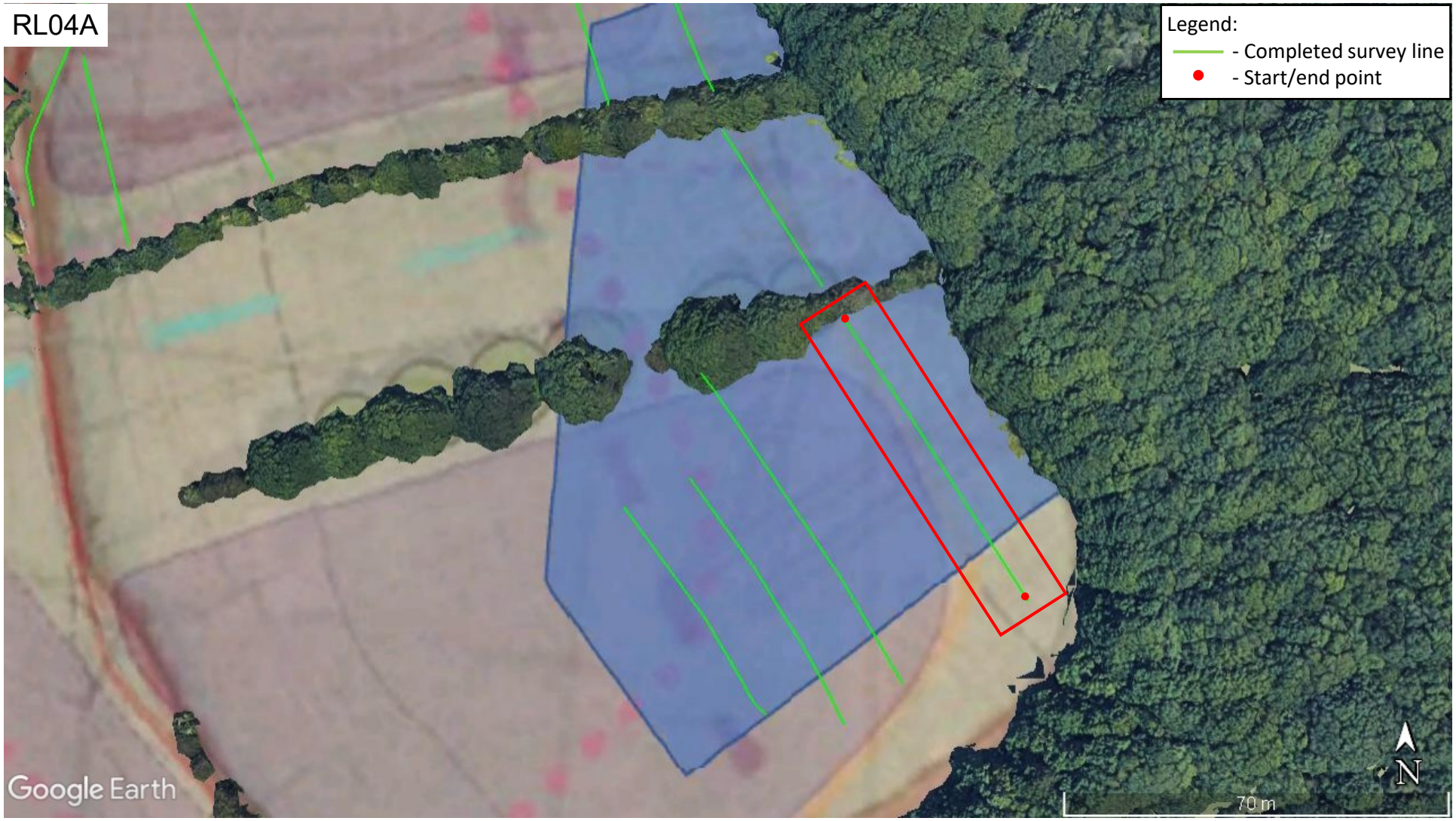
Road structure



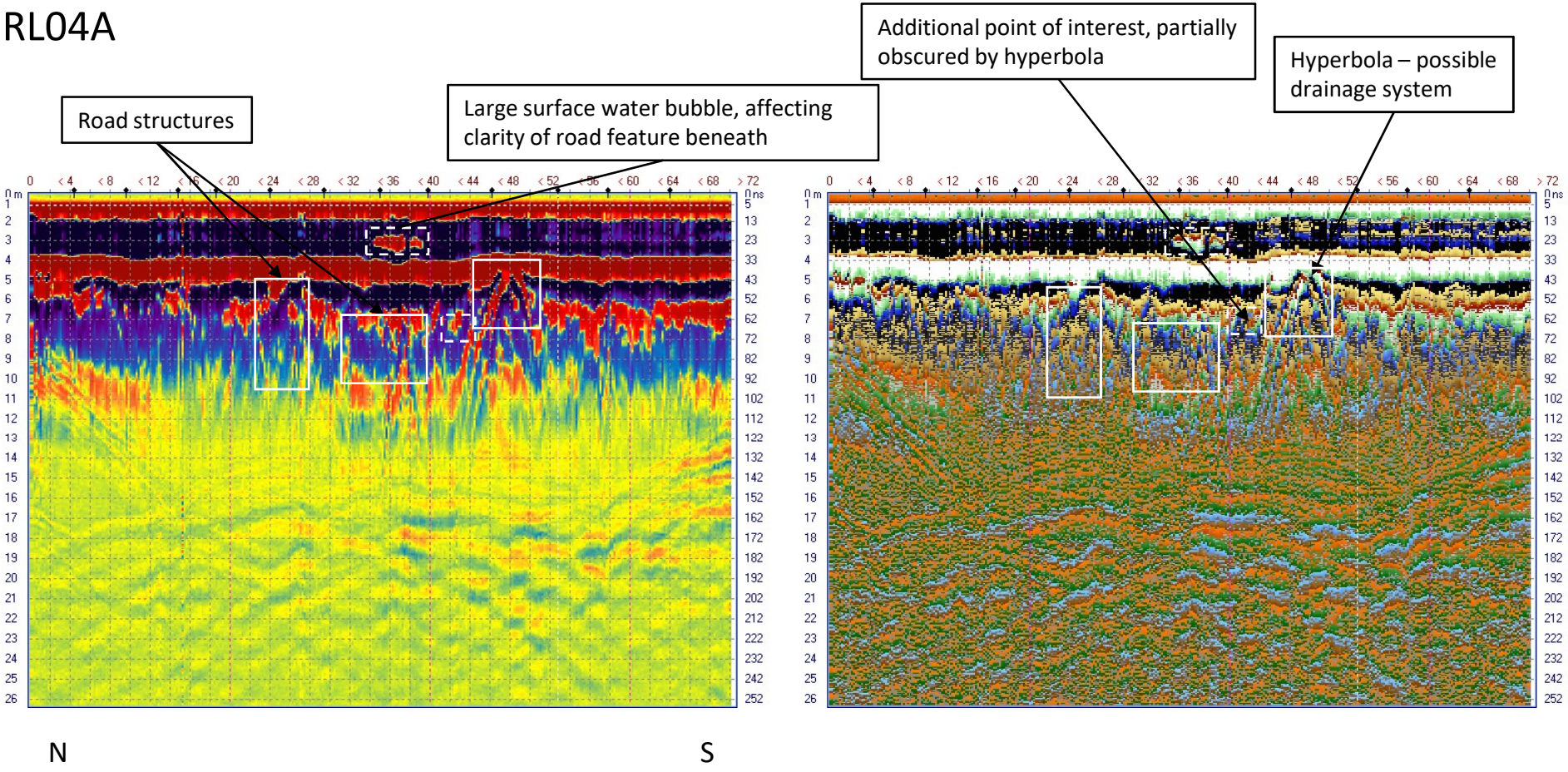


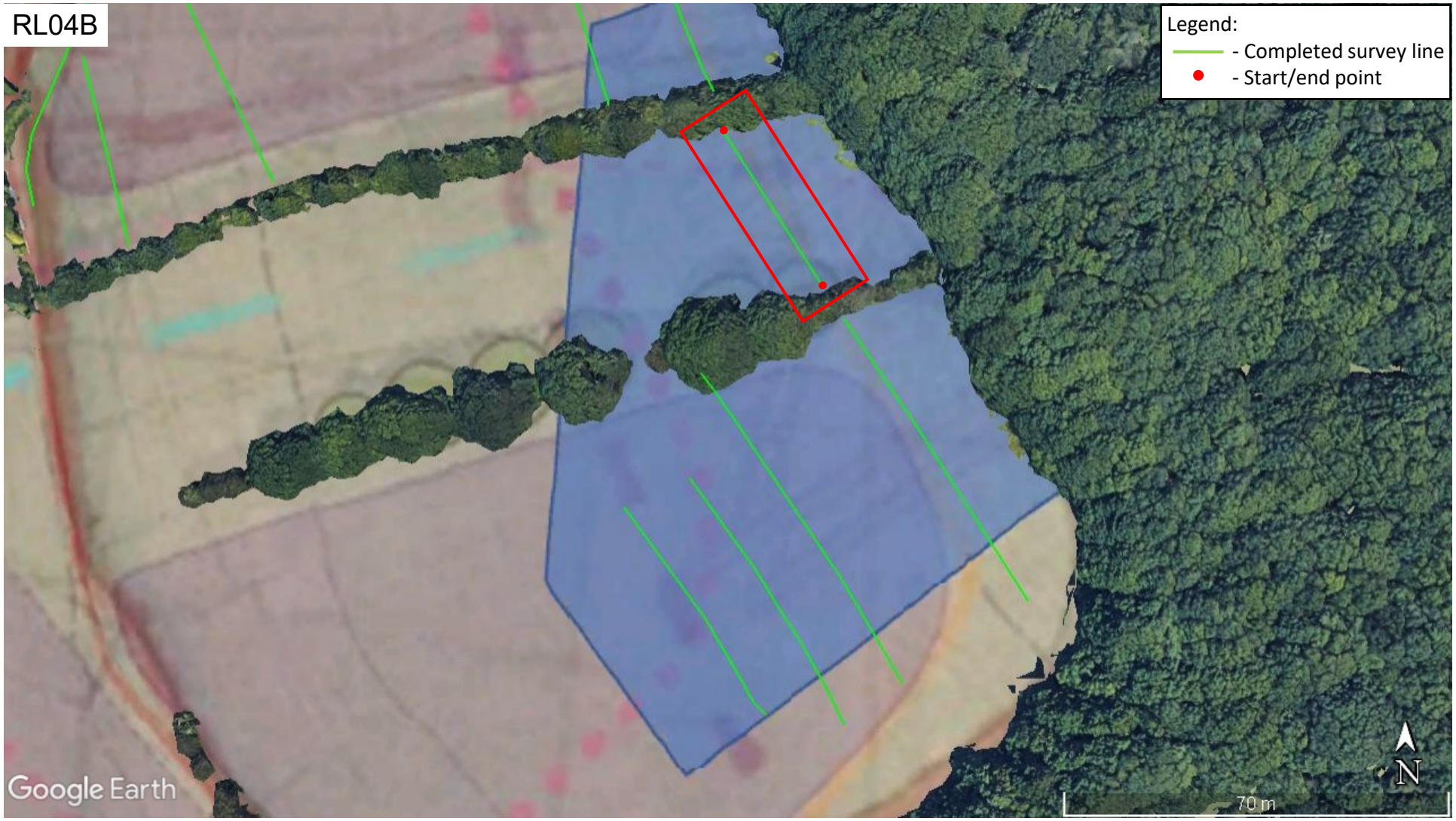
N

S


RL04A
Legend:
- Completed survey line
- Start/end point
Google Earth
70 m
N

RL04A

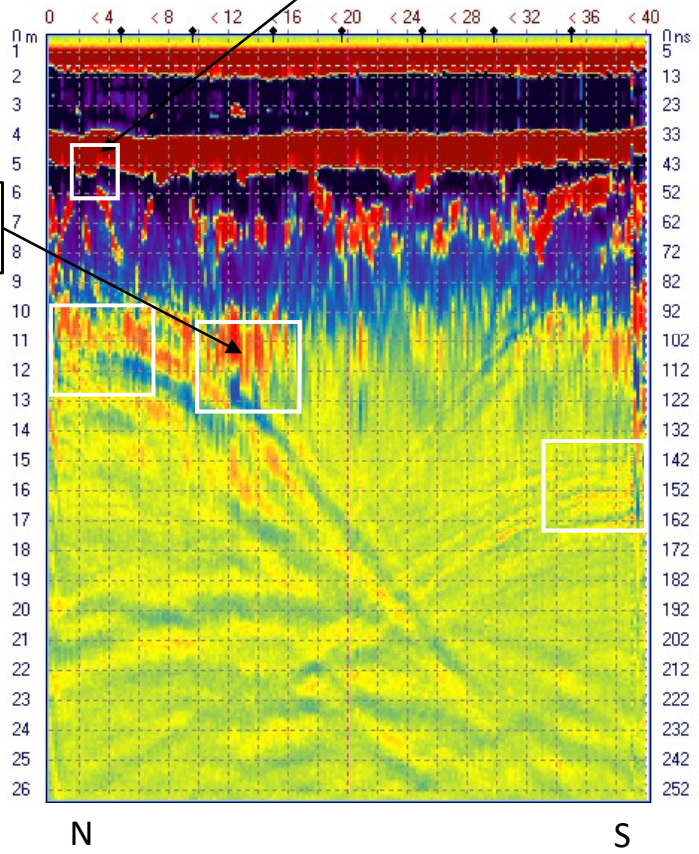

Road structures
Large surface water bubble, affecting clarity of road feature beneath
Additional point of interest, partially obscured by hyperbola
Hyperbola – possible drainage system
N
S


RL04B
Legend:
- Completed survey line
- Start/end point
Google Earth
70 m
N

RL04B

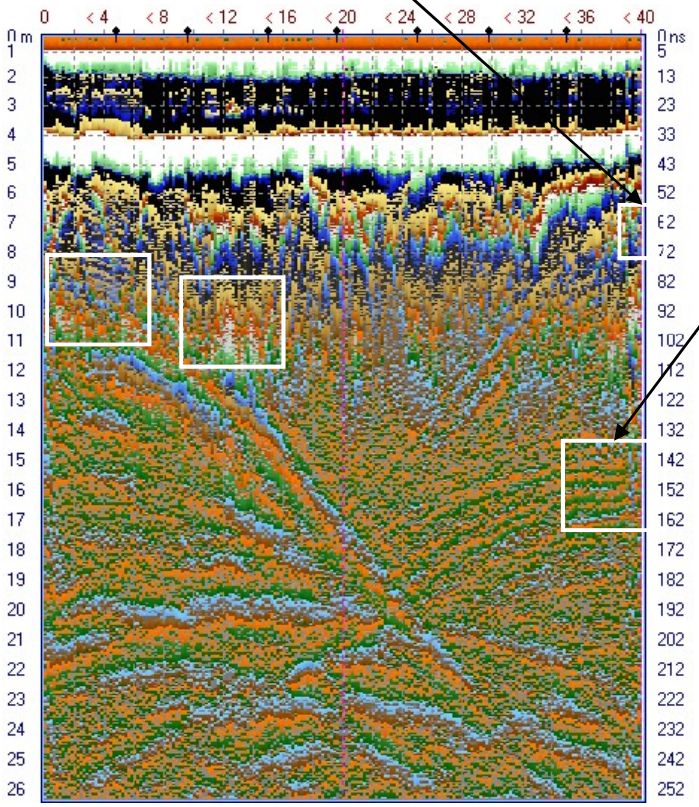
Hyperbola feature at northern endpoint, with underlying strong response nearing tree line

Zone of interest



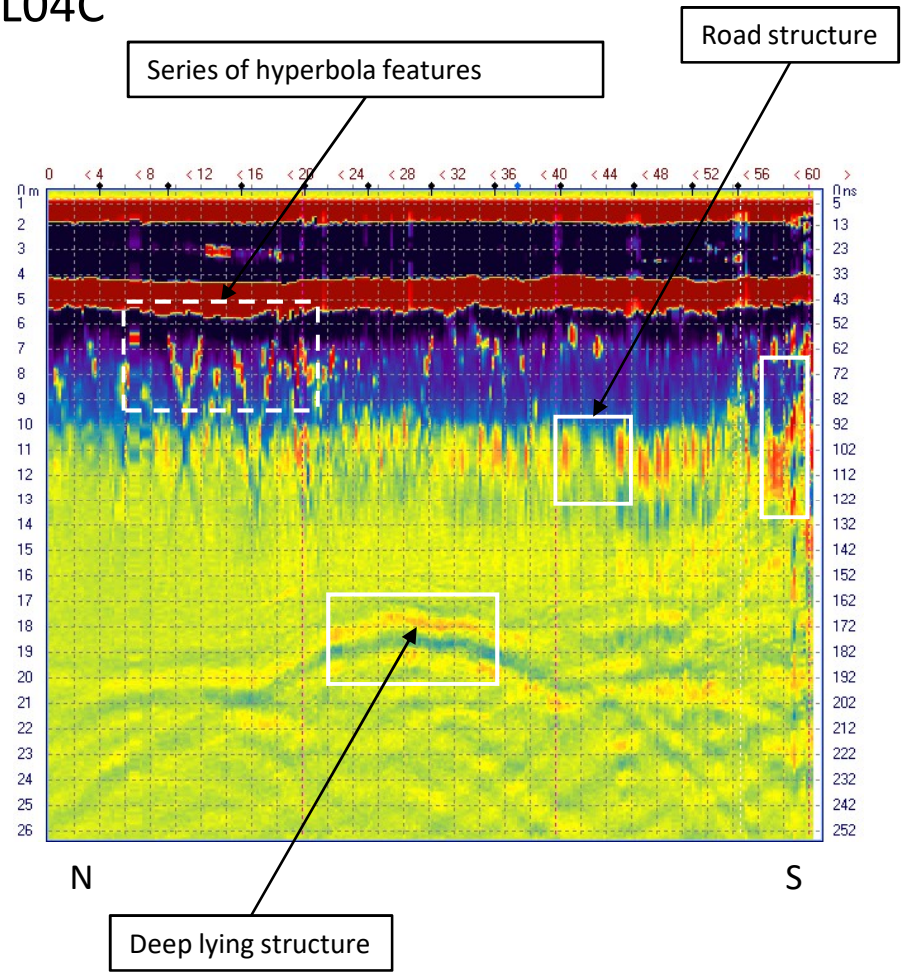
Road structure seen at very southern end of profile runs mostly into hedge line so only partial coverage however looks consistent.

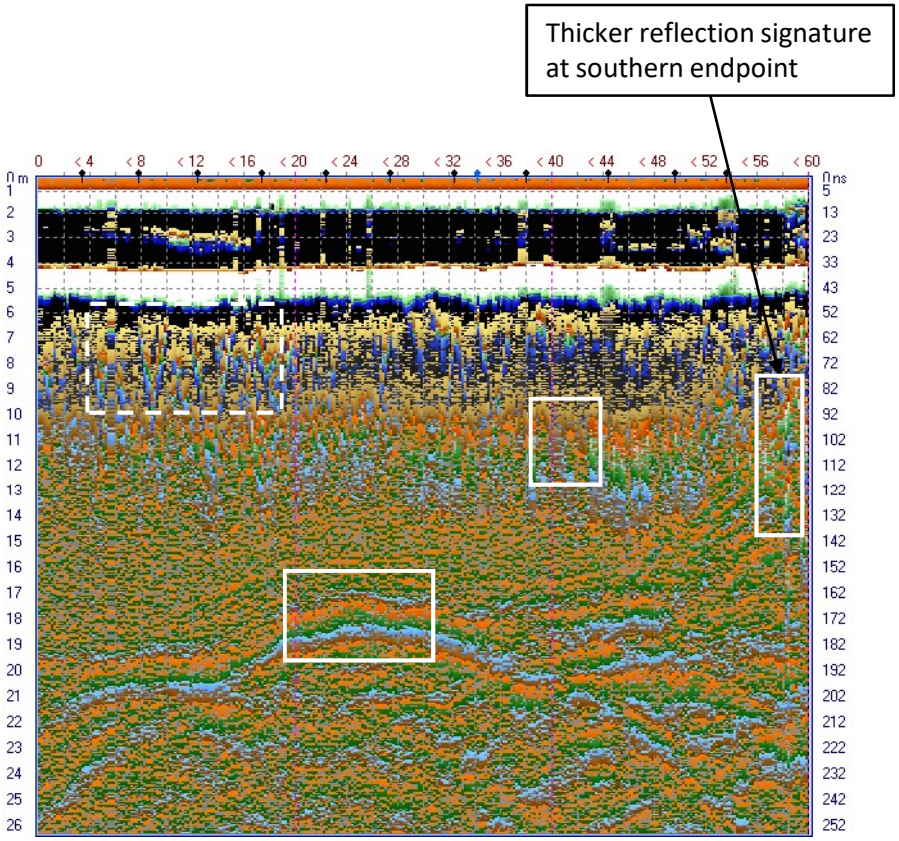
Series of reflectors beneath zone of road structure




RL04C
Legend:
- Completed survey line
- Start/end point
Hermitage Park
Google Earth
70 m
N

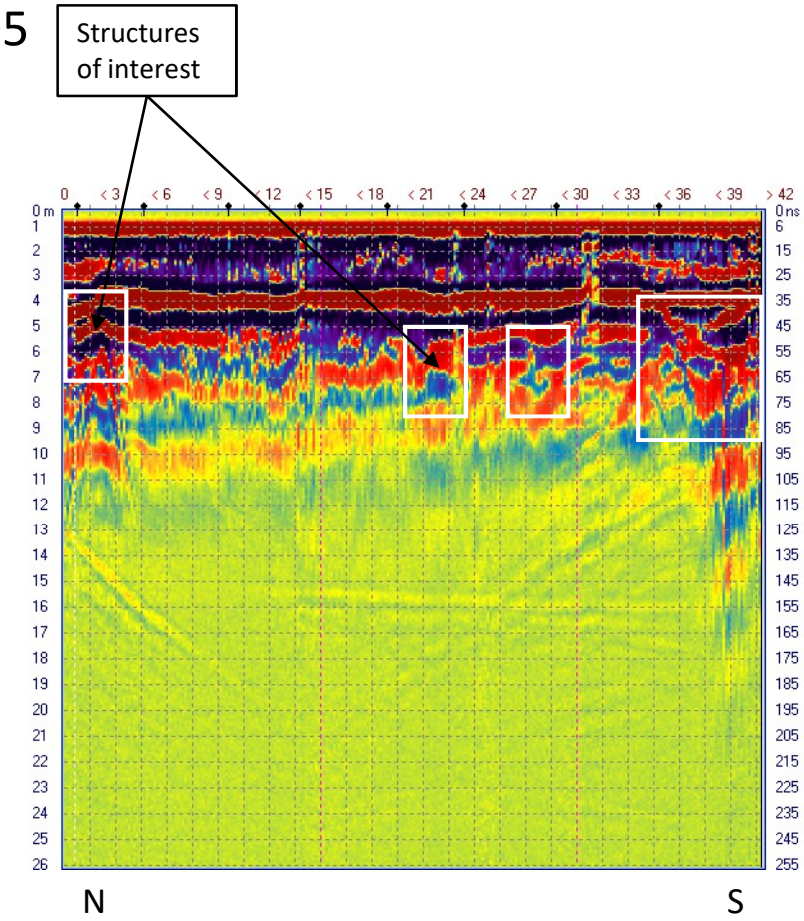
RL04C

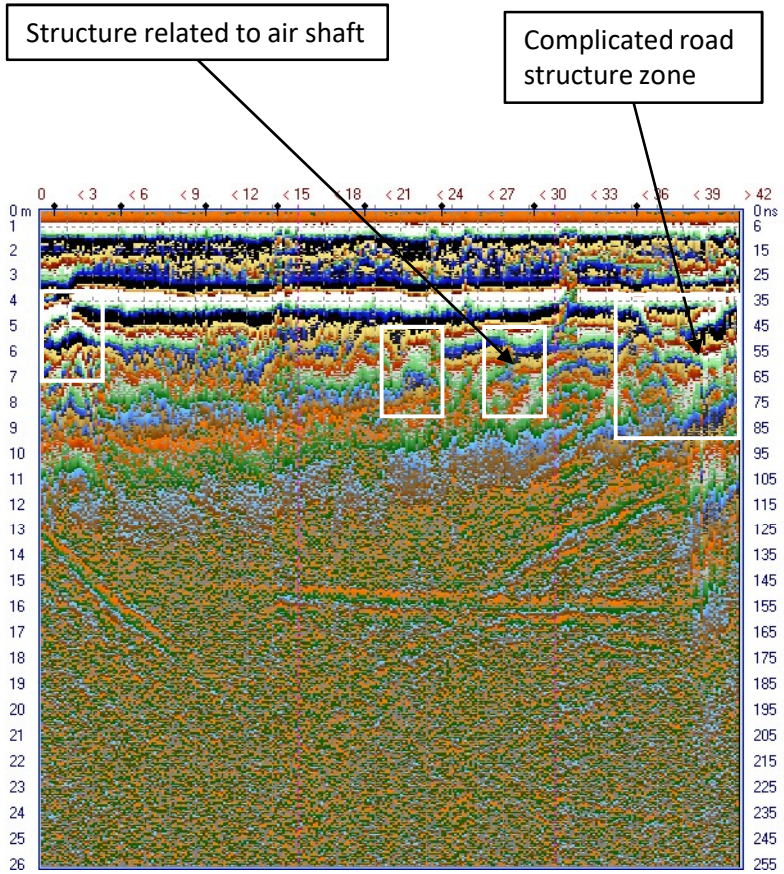

Series of hyperbola features
Road structure
Deep lying structure
N
S


Thicker reflection signature at southern endpoint


RL05
Legend:
- Completed survey line
- Start/end point
Hermitage Park
Google Earth
70 m
N

RL05


Structures of interest
N
S


Structure related to air shaft
Complicated road structure zone

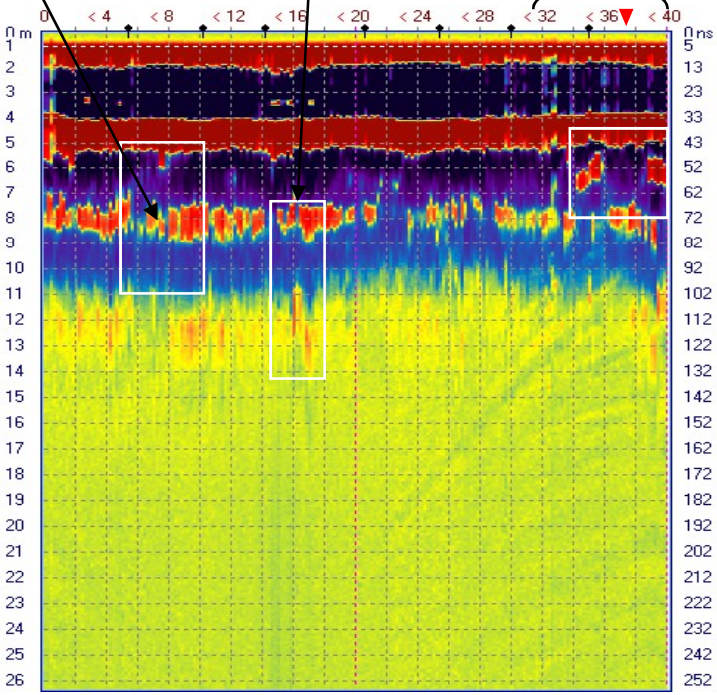

RL06
Legend:
- Completed survey line
- Start/end point
Hermitage Park
Google Earth
70 m
N

RL06

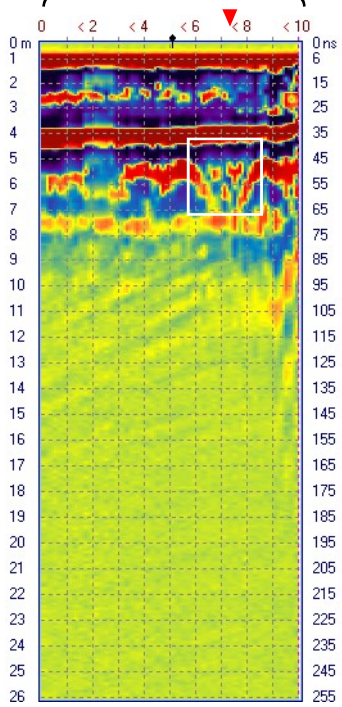
Road structure

10m section of this RL06 was surveyed with the 1m antennae and 1MHz transmitter to see the identified 3m wide road feature in the south of the line in greater detail.

Zone of interest

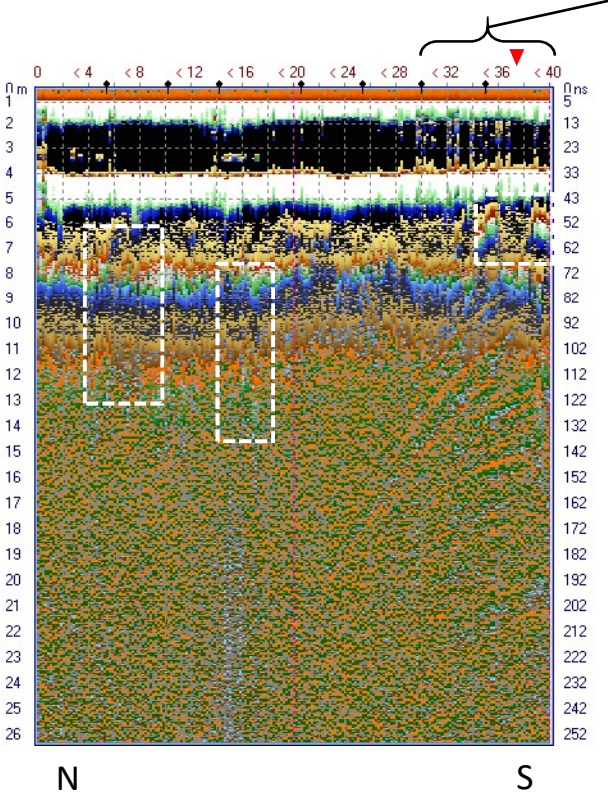


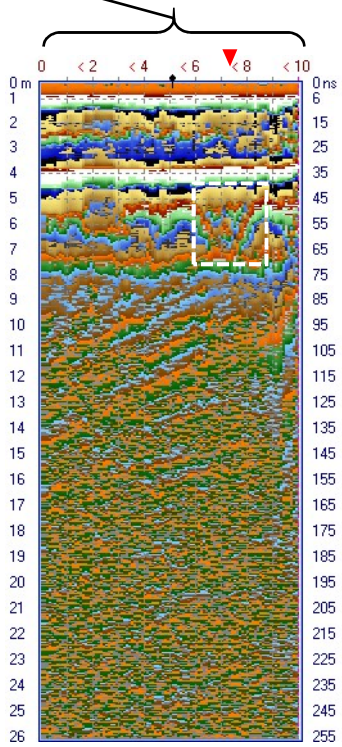
N S



RL06

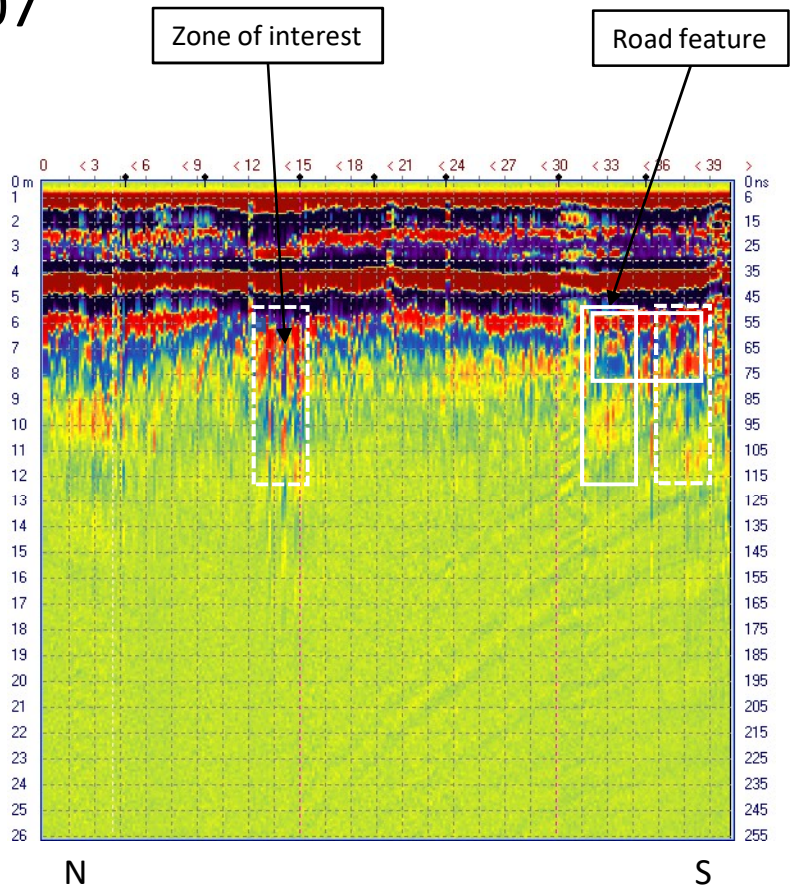
10m section of this RL06 was surveyed with the 1m antennae and 1MHz transmitter to see the identified 3m wide road feature in the south of the line in greater detail.

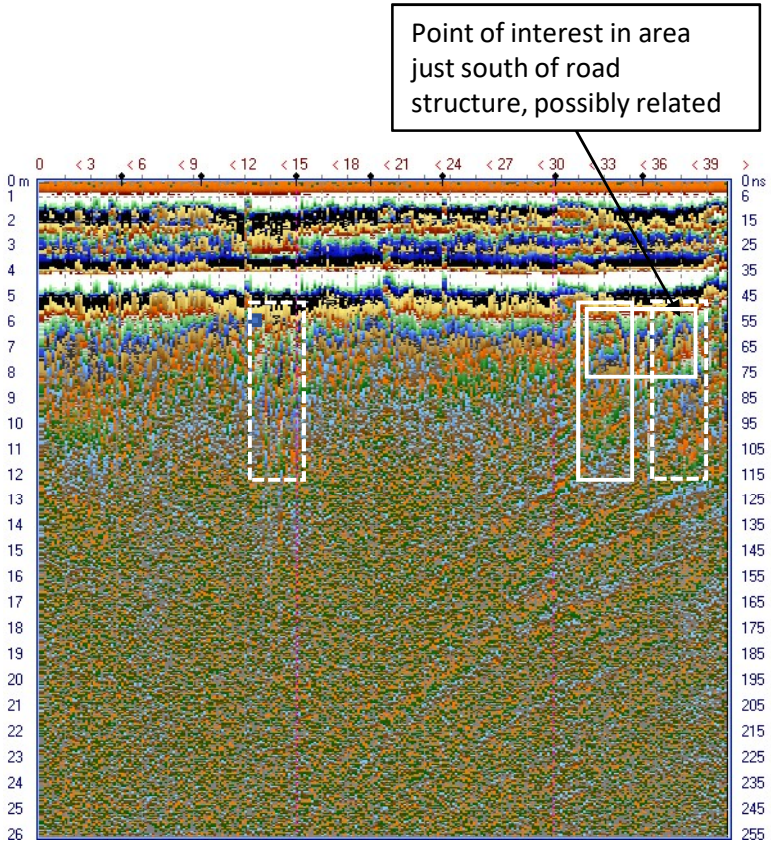





RL07
Legend:
- Completed survey line
- Start/end point
Hermitage Park
Google Earth
70 m
N

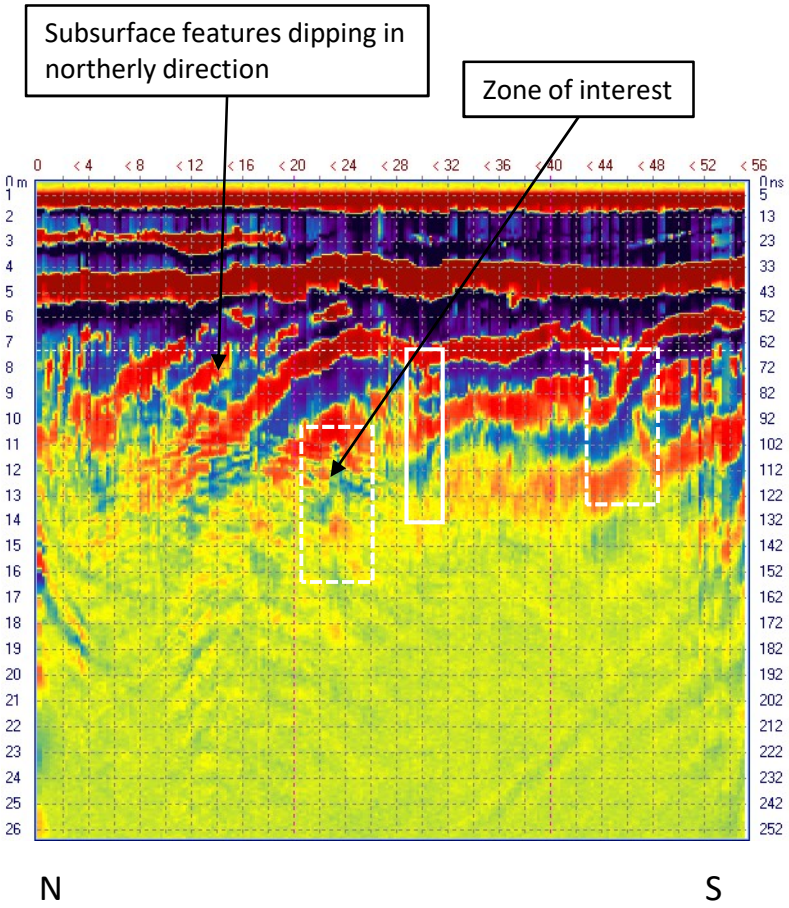
RL07

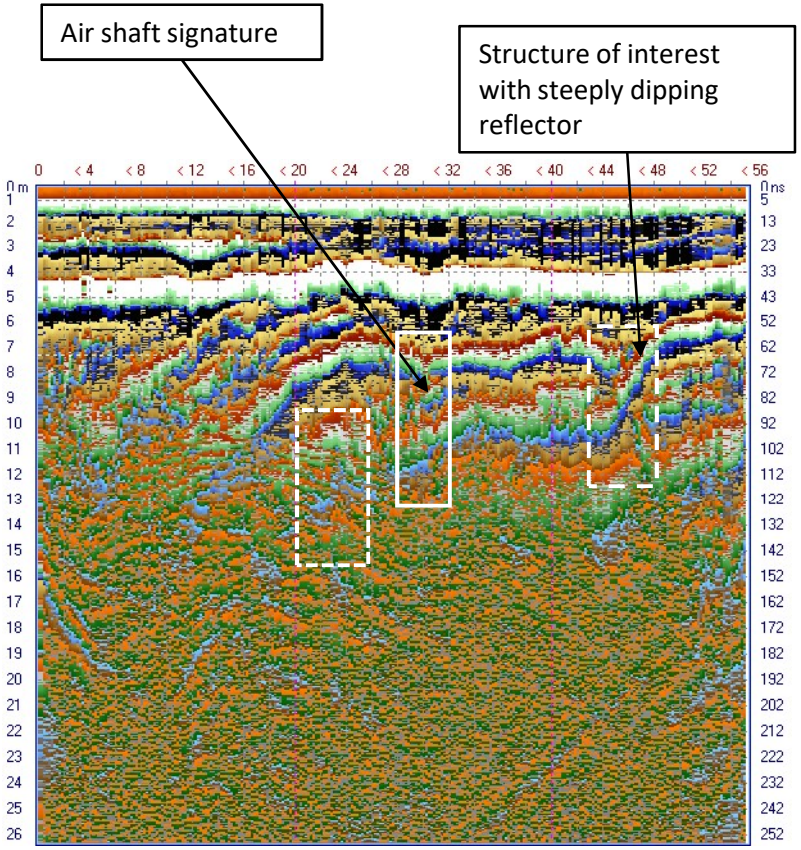

Zone of interest
Road feature
N
S

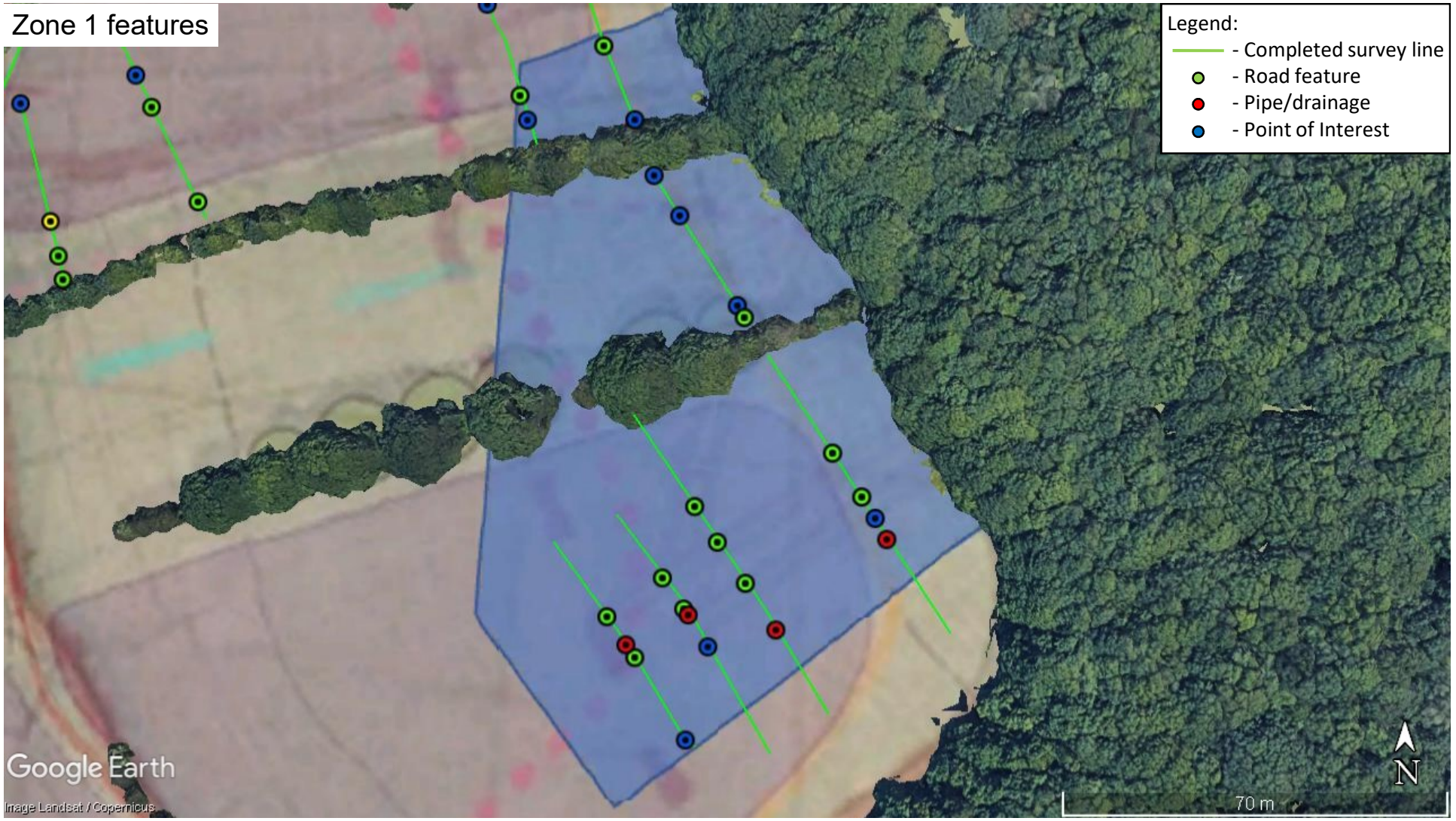

Point of interest in area just south of road structure, possibly related


RL08
Legend:
- Completed survey line
- Start/end point
Hermitage Park
Google Earth
70 m
N

RL08


Subsurface features dipping in northerly direction
Zone of interest
N
S


Air shaft signature
Structure of interest with steeply dipping reflector


Zone 1 features
Legend:
- Completed survey line
- Road feature
- Pipe/drainage
- Point of Interest
Google Earth
Image Landsat / Copernicus
N
70 m


Zone 2 features
Legend:
- Completed survey line
- Road feature
- Air shaft feature
- Point of Interest
Google Earth
Image Landsat / Copernicus
60 m
N

END OF DOCUMENT

APPENDIX 6

STATISTICAL ANALYSIS OF CHEMICAL DATA

Landuse	SOM%		3959					
Residential with Gardens	2.5		Lepton Road		Natural Cohesive Topsoil			
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		15	0	7.20	3.10	5.25	6.83
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	31	6	45.00	8.60	29.08	36.73
Boron	mg/kg	290	15	0	0.60	0.30	0.45	0.59
Cadmium	mg/kg	11	15	0	0.40	0.20	0.23	0.30
Chromium III	mg/kg	910	15	0	26.00	16.00	21.07	25.39
Chromium VI	mg/kg	6	15	0	0.50	0.50	0.50	0.50
Copper	mg/kg	2400	15	0	420.00	21.00	69.00	180.89
Lead	mg/kg	200	15	0	190.00	35.00	76.15	118.68
Elemental Mercury	mg/kg	1.2	15	0	0.210	0.025	0.128	0.194
Nickel	mg/kg	180	15	0	42.00	14.00	21.00	28.90
Selenium	mg/kg	250	9	0	1.30	0.25	0.59	1.09
Zinc	mg/kg	3700	15	0	110.00	62.00	81.87	99.24
Cyanide Total	mg/kg		15	0	0.800	0.200	0.413	0.617
Inorganic Cyanide	mg/kg	26.8	15	0	0.50	0.05	0.28	0.44
Thiocyanate	mg/kg		0	0	0.00	0.00	-	-
Aliphatic EC 5-6	mg/kg	78	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >6-8	mg/kg	230	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >8-10	mg/kg	65	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >10-12	mg/kg	330	15	0	0.75	0.75	0.75	0.75
Aliphatic EC >12-16	mg/kg	2400	15	0	0.60	0.60	0.60	0.60
Aliphatic C16-C21	mg/kg		15	0	0.75	0.75	0.75	0.75
Aliphatic C21-C35	mg/kg		15	0	1.70	1.70	1.70	1.70
Aliphatic EC >16-35	mg/kg	92000	15	0	2.45	2.45	2.45	2.45
Aliphatic C5-C35	mg/kg		15	0	5.00	5.00	5.00	5.00
Aromatic EC 5-7 (benzene)	mg/kg	140	15	0	0.01	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	290	15	0	0.01	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	83	15	0	0.01	0.01	0.01	0.01
Aromatic EC >10-12	mg/kg	180	15	0	0.45	0.45	0.45	0.45
Aromatic EC >12-16	mg/kg	330	15	0	0.25	0.25	0.25	0.25
Aromatic EC >16-21	mg/kg	540	15	0	0.30	0.30	0.30	0.30
Aromatic EC >21-35	mg/kg	1500	15	0	0.70	0.70	0.70	0.70
Aromatic C5-C35	mg/kg		15	0	5.00	5.00	5.00	5.00
TPH Ali/Aro	mg/kg		15	0	5.00	5.00	5.00	5.00
EPH (C10-C40)	mg/kg		0	0	0.00	0.00	-	-
Benzene	mg/kg	0.17	15	0	0.01	0.01	0.01	0.01
Ethylbenzene	mg/kg	110	15	0	0.01	0.01	0.01	0.01
Toluene	mg/kg	290	15	0	0.01	0.01	0.01	0.01
Xylenes	mg/kg	130	15	0	0.01	0.01	0.01	0.01
MTBE	mg/kg		15	0	0.01	0.01	0.01	0.01
PAHs								
Naphthalene	mg/kg	5.6	15	0	0.02	0.02	0.02	0.02
Acenaphthylene	mg/kg	420	15	0	0.02	0.02	0.02	0.02
Acenaphthene	mg/kg	510	15	0	0.02	0.02	0.02	0.02
Fluorene	mg/kg	400	15	0	0.02	0.02	0.02	0.02
Phenanthrene	mg/kg	220	15	0	0.15	0.02	0.05	0.09
Anthracene	mg/kg	5400	15	0	0.04	0.02	0.02	0.02
Fluoranthene	mg/kg	560	15	0	0.29	0.02	0.08	0.15
Pyrene	mg/kg	1200	15	0	0.25	0.02	0.07	0.13
Benzo(a)anthracene	mg/kg	11	15	0	0.09	0.02	0.04	0.07
Chrysene	mg/kg	22	15	0	0.07	0.02	0.02	0.04
Benzo(b)fluoranthene	mg/kg	3.3	15	0	0.06	0.02	0.02	0.04
Benzo(k)fluoranthene	mg/kg	93	15	0	0.02	0.02	0.02	0.02
Benzo(a)pyrene	mg/kg	2.7	15	0	0.04	0.02	0.02	0.02
Indeno(1,2,3-c,d)pyrene	mg/kg	36	15	0	0.02	0.02	0.02	0.02
Dibenzo(a,h)anthracene	mg/kg	0.28	15	0	0.02	0.02	0.02	0.02
Benzo(g,h,i)perylene	mg/kg	340	15	0	0.02	0.02	0.02	0.02
PAH	mg/kg		15	0	0.98	0.05	0.24	0.50
Phenol	mg/kg	200	15	0	1.30	0.15	0.66	1.16

BUILDINGS AND SERVICES								
pH		5	15	0	6.70	5.20	6.00	6.49
Chloride Aqueous Extract	mg/l	100	15	0	12.00	1.50	3.94	6.70
Sulphate Aqueous Extract as SO4	mg/l	500	15	0	31.00	5.00	16.60	24.30
Sulphur (free)	mg/kg		0	0	0.00	0.00	-	-
Total Sulphate as SO4	%		15	0	7470.00	475.00	1312.53	3247.53
PLANTS								
Copper	mg/kg	600	15	0	420.00	21.00	69.00	180.89
Nickel	mg/kg	250	15	0	42.00	14.00	21.00	28.90
Zinc	mg/kg	3000	15	0	110.00	62.00	81.87	99.24
Boron	mg/kg	30	15	0	0.60	0.30	0.45	0.59
Cadmium	mg/kg	15	15	0	0.40	0.20	0.23	0.30
Chromium VI	mg/kg	600	15	0	1	1	1	1
Total Chromium	mg/kg	1000	15	0	26.00	16.00	21.07	25.39
Mercury	mg/kg	20	15	0	0.210	0.025	0.128	0.194
Lead	mg/kg	2000	15	0	190.00	35.00	76.15	118.68
Arsenic	mg/kg	80	31	0	45.00	8.60	29.08	36.73
Selenium	mg/kg	50	9	0	1.30	0.25	0.59	1.09

Landuse	SOM%		3959					
Residential with Gardens	1		Lepton Road		Natural Cohesive			
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		15	0	3.20	0.20	0.75	1.55
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	15	0	12.00	3.10	6.23	8.52
Boron	mg/kg	290	15	0	0.20	0.10	0.11	0.15
Cadmium	mg/kg	11	15	0	0.05	0.05	0.05	0.05
Chromium III	mg/kg	910	15	0	29.00	12.00	20.60	25.50
Chromium VI	mg/kg	6	15	0	0.50	0.50	0.50	0.50
Copper	mg/kg	2400	15	0	45.00	13.00	26.73	37.06
Lead	mg/kg	200	15	0	23.00	9.60	14.60	18.85
Elemental Mercury	mg/kg	1.2	15	0	0.025	0.025	0.025	0.025
Nickel	mg/kg	180	15	0	31.00	11.00	21.60	28.26
Selenium	mg/kg	250	2	0	0.25	0.25	0.25	-
Zinc	mg/kg	3700	15	0	71.00	40.00	55.27	65.36
Cyanide Total	mg/kg		15	0	0.100	0.050	0.053	0.068
Inorganic Cyanide	mg/kg	26.8	15	0	0.05	0.05	0.05	0.05
Thiocyanate	mg/kg		0	0	0.00	0.00	-	-
Aliphatic EC 5-6	mg/kg	42	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >6-8	mg/kg	100	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >8-10	mg/kg	27	15	0	0.01	0.01	0.01	0.01
Aliphatic EC >10-12	mg/kg	130	15	0	0.75	0.75	0.75	0.75
Aliphatic EC >12-16	mg/kg	1100	15	0	0.60	0.60	0.60	0.60
Aliphatic C16-C21	mg/kg		15	0	0.75	0.75	0.75	0.75
Aliphatic C21-C35	mg/kg		15	0	1.70	1.70	1.70	1.70
Aliphatic EC >16-35	mg/kg	65000	15	0	2.45	2.45	2.45	2.45
Aliphatic C5-C35	mg/kg		15	0	5.00	5.00	5.00	5.00
Aromatic EC 5-7 (benzene)	mg/kg	70	15	0	0.01	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	130	15	0	0.01	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	34	15	0	0.01	0.01	0.01	0.01
Aromatic EC >10-12	mg/kg	74	15	0	0.45	0.45	0.45	0.45
Aromatic EC >12-16	mg/kg	140	15	0	0.25	0.25	0.25	0.25
Aromatic EC >16-21	mg/kg	260	15	0	0.30	0.30	0.30	0.30
Aromatic EC >21-35	mg/kg	1100	15	0	0.70	0.70	0.70	0.70
Aromatic C5-C35	mg/kg		15	0	5.00	5.00	5.00	5.00
TPH Ali/Aro	mg/kg		15	0	5.00	5.00	5.00	5.00
EPH (C10-C40)	mg/kg		0	0	0.00	0.00	-	-
Benzene	mg/kg	0.087	15	0	0.01	0.01	0.01	0.01
Ethylbenzene	mg/kg	47	15	0	0.01	0.01	0.01	0.01
Toluene	mg/kg	130	15	0	0.01	0.01	0.01	0.01
Xylenes	mg/kg	56	15	0	0.01	0.01	0.01	0.01
MTBE	mg/kg		15	0	0.01	0.01	0.01	0.01
PAHs								
Naphthalene	mg/kg	2.3	15	0	0.02	0.02	0.02	0.02
Acenaphthylene	mg/kg	170	15	0	0.02	0.02	0.02	0.02
Acenaphthene	mg/kg	210	15	0	0.02	0.02	0.02	0.02
Fluorene	mg/kg	170	15	0	0.02	0.02	0.02	0.02
Phenanthrene	mg/kg	95	15	0	0.02	0.02	0.02	0.02
Anthracene	mg/kg	2400	15	0	0.02	0.02	0.02	0.02
Fluoranthene	mg/kg	280	15	0	0.02	0.02	0.02	0.02
Pyrene	mg/kg	620	15	0	0.02	0.02	0.02	0.02
Benzo(a)anthracene	mg/kg	7.2	15	0	0.05	0.02	0.03	0.05
Chrysene	mg/kg	15	15	0	0.04	0.02	0.02	0.04
Benzo(b)fluoranthene	mg/kg	2.6	15	0	0.02	0.02	0.02	0.02
Benzo(k)fluoranthene	mg/kg	77	15	0	0.02	0.02	0.02	0.02
Benzo(a)pyrene	mg/kg	2.2	15	0	0.02	0.02	0.02	0.02
Indeno(1,2,3-c,d)pyrene	mg/kg	27	15	0	0.02	0.02	0.02	0.02
Dibenzo(a,h)anthracene	mg/kg	0.24	15	0	0.02	0.02	0.02	0.02
Benzo(g,h,i)perylene	mg/kg	320	15	0	0.02	0.02	0.02	0.02
PAH	mg/kg		15	0	0.05	0.05	0.05	0.05
Phenol	mg/kg	120	15	0	0.50	0.15	0.17	0.28

BUILDINGS AND SERVICES								
pH		5	15	0	6.60	5.10	6.03	6.64
Chloride Aqueous Extract	mg/l	100	15	0	3.60	0.50	1.94	2.72
Sulphate Aqueous Extract as SO4	mg/l	500	15	0	52.00	5.00	22.33	39.51
Sulphur (free)	mg/kg		0	0	0.00	0.00	-	-
Total Sulphate as SO4	%		15	0	1100.00	50.00	369.27	634.08
PLANTS								
Copper	mg/kg	600	15	0	45.00	13.00	26.73	37.06
Nickel	mg/kg	250	15	0	31.00	11.00	21.60	28.26
Zinc	mg/kg	3000	15	0	71.00	40.00	55.27	65.36
Boron	mg/kg	30	15	0	0.20	0.10	0.11	0.15
Cadmium	mg/kg	15	15	0	0.05	0.05	0.05	0.05
Chromium VI	mg/kg	600	15	0	1	1	1	1
Total Chromium	mg/kg	1000	15	0	29.00	12.00	20.60	25.50
Mercury	mg/kg	20	15	0	0.025	0.025	0.025	0.025
Lead	mg/kg	2000	15	0	23.00	9.60	14.60	18.85
Arsenic	mg/kg	80	15	0	12.00	3.10	6.23	8.52
Selenium	mg/kg	50	2	0	0.25	0.25	0.25	-

Landuse	SOM%		3959					
Residential with Gardens	6		Lepton Road		Natural Cohesive Topsoil			
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		1	0	0.60	0.60	0.60	-
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	1	0	7.30	7.30	7.30	-
Boron	mg/kg	290	1	0	0.10	0.10	0.10	-
Cadmium	mg/kg	11	1	0	0.05	0.05	0.05	-
Chromium III	mg/kg	910	1	0	24.00	24.00	24.00	-
Chromium VI	mg/kg	6	1	0	0.50	0.50	0.50	-
Copper	mg/kg	2400	1	0	29.00	29.00	29.00	-
Lead	mg/kg	200	1	0	11.00	11.00	11.00	-
Elemental Mercury	mg/kg	1.2	1	0	0.025	0.025	0.025	-
Nickel	mg/kg	180	1	0	24.00	24.00	24.00	-
Selenium	mg/kg	250	0	0	0.00	0.00	-	-
Zinc	mg/kg	3700	1	0	53.00	53.00	53.00	-
Cyanide Total	mg/kg		1	0	0.050	0.050	0.050	-
Inorganic Cyanide	mg/kg	26.8	1	0	0.05	0.05	0.05	-
Thiocyanate	mg/kg		0	0	0.00	0.00	-	-
Aliphatic EC 5-6	mg/kg	160	1	0	0.01	0.01	0.01	-
Aliphatic EC >6-8	mg/kg	530	1	0	0.01	0.01	0.01	-
Aliphatic EC >8-10	mg/kg	150	1	0	0.01	0.01	0.01	-
Aliphatic EC >10-12	mg/kg	760	1	0	0.75	0.75	0.75	-
Aliphatic EC >12-16	mg/kg	4300	1	0	0.60	0.60	0.60	-
Aliphatic C16-C21	mg/kg		1	0	0.75	0.75	0.75	-
Aliphatic C21-C35	mg/kg		1	0	1.70	1.70	1.70	-
Aliphatic EC >16-35	mg/kg	110000	1	0	2.45	2.45	2.45	-
Aliphatic C5-C35	mg/kg		1	0	5.00	5.00	5.00	-
Aromatic EC 5-7 (benzene)	mg/kg	300	1	0	0.01	0.01	0.01	-
Aromatic EC >7-8 (toluene)	mg/kg	660	1	0	0.01	0.01	0.01	-
Aromatic EC >8-10	mg/kg	190	1	0	0.01	0.01	0.01	-
Aromatic EC >10-12	mg/kg	380	1	0	0.45	0.45	0.45	-
Aromatic EC >12-16	mg/kg	660	1	0	0.25	0.25	0.25	-
Aromatic EC >16-21	mg/kg	930	1	0	0.30	0.30	0.30	-
Aromatic EC >21-35	mg/kg	1700	1	0	0.70	0.70	0.70	-
Aromatic C5-C35	mg/kg		1	0	5.00	5.00	5.00	-
TPH Ali/Aro	mg/kg		1	0	5.00	5.00	5.00	-
EPH (C10-C40)	mg/kg		0	0	0.00	0.00	-	-
Benzene	mg/kg	0.37	1	0	0.01	0.01	0.01	-
Ethylbenzene	mg/kg	260	1	0	0.01	0.01	0.01	-
Toluene	mg/kg	660	1	0	0.01	0.01	0.01	-
Xylenes	mg/kg	310	1	0	0.01	0.01	0.01	-
MTBE	mg/kg		1	0	0.01	0.01	0.01	-
PAHs								
Naphthalene	mg/kg	13	1	0	0.02	0.02	0.02	-
Acenaphthylene	mg/kg	920	1	0	0.02	0.02	0.02	-
Acenaphthene	mg/kg	1100	1	0	0.02	0.02	0.02	-
Fluorene	mg/kg	860	1	0	0.02	0.02	0.02	-
Phenanthrene	mg/kg	440	1	0	0.02	0.02	0.02	-
Anthracene	mg/kg	11000	1	0	0.02	0.02	0.02	-
Fluoranthene	mg/kg	890	1	0	0.02	0.02	0.02	-
Pyrene	mg/kg	2000	1	0	0.02	0.02	0.02	-
Benzo(a)anthracene	mg/kg	13	1	0	0.05	0.05	0.05	-
Chrysene	mg/kg	27	1	0	0.03	0.03	0.03	-
Benzo(b)fluoranthene	mg/kg	3.7	1	0	0.02	0.02	0.02	-
Benzo(k)fluoranthene	mg/kg	100	1	0	0.02	0.02	0.02	-
Benzo(a)pyrene	mg/kg	3	1	0	0.03	0.03	0.03	-
Indeno(1,2,3-c,d)pyrene	mg/kg	41	1	0	0.02	0.02	0.02	-
Dibenzo(a,h)anthracene	mg/kg	0.3	1	0	0.02	0.02	0.02	-

Benzo(g,h,i)perylene	mg/kg	350	1	0	0.02	0.02	0.02	-
PAH	mg/kg		1	0	0.05	0.05	0.05	-
Phenol	mg/kg	380	1	0	0.15	0.15	0.15	-
BUILDINGS AND SERVICES								
pH		5	1	0	6.60	6.60	6.60	-
Chloride Aqueous Extract	mg/l	100	1	0	3.20	3.20	3.20	-
Sulphate Aqueous Extract as SO4	mg/l	500	1	0	11.00	11.00	11.00	-
Sulphur (free)	mg/kg		0	0	0.00	0.00	-	-
Total Sulphate as SO4	%		1	0	191.00	191.00	191.00	-
PLANTS								
Copper	mg/kg	600	1	0	29.00	29.00	29.00	-
Nickel	mg/kg	250	1	0	24.00	24.00	24.00	-
Zinc	mg/kg	3000	1	0	53.00	53.00	53.00	-
Boron	mg/kg	30	1	0	0.10	0.10	0.10	-
Cadmium	mg/kg	15	1	0	0.05	0.05	0.05	-
Chromium VI	mg/kg	600	1	0	1	1	1	-
Total Chromium	mg/kg	1000	1	0	24.00	24.00	24.00	-
Mercury	mg/kg	20	1	0	0.025	0.025	0.025	-
Lead	mg/kg	2000	1	0	11.00	11.00	11.00	-
Arsenic	mg/kg	80	1	0	7.30	7.30	7.30	-
Selenium	mg/kg	50	0	0	0.00	0.00	-	-

APPENDIX 7

GENERIC ASSESSMENT CRITERIA

GENERIC ASSESSMENT CRITERIA AND THEIR DERIVATION

INTRODUCTION

Following the identification of potential pollution linkages specific to this development, a preliminary screen of the chemical data has been undertaken to identify contamination hazards on the site, using Generic Assessment Criteria developed for the specific receptors and conditions. The "criteria" used in this screening process, as presented in the report, have been derived for soils and waters in accordance with current Environment Agency/DEFRA guidance. The hierarchy of sources used in deriving these criteria are presented in the Table overleaf.

The generic assessment values for soil and water have been compiled in order to identify concentrations of contaminants that could potentially pose a significant risk of harm or pollution to the receptors specific to this site. These criteria have been developed as follows:-

Human Health - The proposed development is to be residential and the LQM S4ULs has been assessed as appropriate for the site and, appropriately conservative values for organic matter content have been adopted to select generic assessment values. Where LQM S4ULs are not available CLEA 1.06 values or LQM Generic Human Health Assessment Criteria have been adopted as appropriate.

Property and Services - BRE Special Digest 1 has been used to assess the potential for chemical attack of buried concrete. For buried services (particularly potable water supplies) guidance from the Water Regulations Advisory Scheme has been used for soils. For waters, a conservative approach is used which assumes a human health receptor. Therefore, UK drinking water guidelines have been used.

Surface Waters - UK guidance has been utilised where available to develop screening values for surface waters (i.e. UK drinking water guidelines and Environment Agency EQS). Where guidance for specific determinands is not available the hierarchy of sources listed in the Table overleaf have been used. No UK guidance is currently available for screening contaminant concentrations in soils in relation to protection of surface waters.

Groundwaters - UK guidance (e.g. UK drinking water guidelines) has been utilised in the first instance for screening values for groundwaters and where these do not give screening values the hierarchies listed in the Table overleaf, have been used.

Ecology - Dutch guidelines are generally used to assess whether contaminants are a potential hazard to ecology. Guidelines from Dickinson et.al. 2000, have been used to assess the level of phytotoxicity from copper, nickel and zinc.

HIERARCHY OF SOURCES USED IN DERIVATION OF GENERIC ASSESSMENT CRITERIA

Receptor		Hierarchy
Human Health		**Soils** **1** LQM S4ULs **2** CLEA SGV values **3** LQM Generic Human Health Assessment Criteria **4** ICRCL Guidance of Fire Hazards **5** Dutch Guideline Values **6** USEPA Screening Values **Water** **1** UK Drinking Water Guideline **2** Private Water Supplies Regulations **Soil Gas** **1** CIRIA Guidance **Soil Vapours** **1** CIRIA Guidance
Property	Buried Concrete	**Soils and Water** **1** BRE Special Digest 1
	Potable Water	**Soils** **1** Water Regulations Advisory Scheme Guidance **2** USEPA Screening Values **3** Dutch Guideline **Water** **1** UK Drinking Water Guideline **2** Private Water Supplies Regulations **Soil Gas** **1** CIRIA Guidance **Soil Vapours** **1** CIRIA Guidance
Controlled Waters	Surface Watercourses	**Soils** **1** USEPA Screening Values **2** Dutch Guideline Values **Water** **1** Environment Agency EQS **2** Environment Agency Advice on MTBE **3** Dutch Guideline Values
	Groundwater	**Soils** **1** USEPA Screening Values **2** Dutch Guideline Values **Water** **1** UK Drinking Water Guideline **2** Private Water Supplies Regulations **3** Environment Agency Advice on MTBE **4** Dutch Guideline Values
Landscaping		**Soils** **1** ICRCL 59/83 **Water** **1** None

APPENDIX 8

PRINCIPLES OF CONTAMINATION RISK ASSESSMENT

PRINCIPLES OF CONTAMINATION RISK ASSESSMENT

The Environmental Protection Act 1990, Part II A Contaminated Land (Section 57 of the Environment Act 1995) and the Contaminated Land Regulations 1999 provide a basis on which to determine the unacceptable risks and liabilities presented by a contaminated site. Contaminated Land is defined within Section 78A(2) and in all those Sections mentioned as:-

"Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that-

a) **SIGNIFICANT HARM** is being caused, or there is significant possibility of such harm being caused; or

b) **SIGNIFICANT POLLUTION OF CONTROLLED WATERS** is being caused, or there is a significant possibility of such pollution being caused."

Section 57 of the Environment Act 1995 requires that any site identified as being "contaminated" by the Local Authority will be registered by them and remediation will be required to render the site fit for use.

The presence of contamination is not the sole factor for deciding whether a site is contaminated. Relevant parties should identify site-specific unacceptable risks and provide objective, cost-effective methods to manage the contamination in a manner which satisfies the proposed end-use.

The Environment Agency "Land contamination and Risk Management" guidance defines "risk" as the combination of:-

PROBABILITY OF RISK: or frequency, of occurrence of a defined hazard; and

MAGNITUDE/POTENTIAL SEVERITY: (including the seriousness) of the consequences.

A risk-based approach, which takes both technical and non-technical aspects into consideration when making decisions on contamination resulting from past, present or future human activities, is advocated.

The assessment of unacceptable risks generally relies on the identification of three principal elements forming a 'contaminant linkage':-

SOURCE: is a contaminant or pollutant that is in, on or under the land and that has the potential to cause harm or pollution

RECEPTOR: something that could be adversely affected by a contaminant eg. a person, controlled waters, an organism, an ecosystem, or Part 2A receptors such as buildings, crops or animals

PATHWAY: a route by which a receptor is, or could be, affected by a contaminant

In the absence of any one of these elements, on any given site, there is no risk. Where all three elements are present, a risk assessment is required to determine the significance of the harm or pollution that is being or may be caused. During the risk assessment phase, 'potential contaminant linkages' are used, until they are confirmed. Once confirmed, they are referred to as 'relevant contaminant linkages'. As outlined above, the terms of the Contaminated Land regime specify that remediation need only be implemented where a site is causing, or there is a significant possibility that it will cause, significant harm, or that pollution of controlled waters is being, or is likely to be caused.

Development of contaminated land is usually addressed through the application of planning and development legislation and guidance (i.e. Planning Guidance Note PPS23 Planning and Pollution Control in England). The suitable for use approach is seen as the most appropriate basis to deal with contaminated land, taking account of

environmental, social and economic objectives. The assessment is made in the context of the proposed land use (e.g. residential, commercial, industrial and public open-space).

Definition of Severity of Consequence

The risk assessment has been undertaken by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given below.

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirements for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

Definition of Probability of Occurrence

The likelihood of an event (probability) takes into account the linkage between a hazard and target and the integrity of this pathway, and has been assessed based on the categories given below.

Category	Definition
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low Likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

Risk Matrix

The potential severity of the consequence and the probability of the occurrence have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

		Severity of Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability of Occurrence	**High Likelihood**	Very high	High	Moderate	Low
	Likely	High	Moderate	Low	Very Low
	Low Likelihood	Moderate	Low	Very Low	Negligible
	Unlikely	Low	Very Low	Negligible	Negligible

APPENDIX 9

GEOTECHNICAL ANALYSIS RESULTS

Unit 5E, Edwardson Road, Meadowfield, Durham, DH7 8RL

10258

Test Report: **Determination of Liquid Limit, Plastic Limit & Plasticity Index**
BS EN ISO 17892-12:2018

Report Date: 18.03.2022

Client:	FWS Consultants Unit 2, City West Business Park St Johns Road, Meadowfield Durham DH7 8ER	**Lab ref:**	22-1083 to 22-1100
		Client ref:	FWS3959
		Date sampled:	Refer to logs
Site:	GESE Rowley Lane Lepton	**Sampled by:**	DGE
		Date received:	04.03.2022
Sample location:	See below	**Date test completed:**	17.03.2022
Material:	Refer to logs	**Test conducted by:**	AM
Source of material:	Exploration holes	**Variation from Standard Method:**	None
Test Method:	Clause 4.2	**Cone Type:**	80g/30◦
Method of sample preparation:	0.4mm removed	**Test Type:**	4-Point

Test Results: **Determination of water content of soil** in accordance with BS EN 17892:2014 Water Content

Test Ref/ Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Water Content (%)	Plasticity Class	Material Passing 425µm (%)
TP01 1.0m	38	22	16	17	CI	90
TP03 0.9m	34	22	12	16	CL	100
TP04 1.7m	60	32	28	32	CH	100
TP05 1.9m	53	34	19	26	CH	25
TP06 1.1m	40	23	17	24	CI	97
TP07 0.9m	34	22	12	17	CL	97
TP08 0.9m	44	22	22	15	CI	98
TP09 0.8m	49	25	24	27	CI	99
TP10 2.0m	48	27	21	20	CI	97
TP13 1.0m	44	27	17	23	CI	99
TP15 1.0m	49	24	25	23	CI	100
WS1 1.5m	46	22	24	23	CI	98
WS3 1.8m	44	27	17	19	CI	99
WS4 1.25m	53	27	26	18	CI	99
WS5 2.1m	40	22	18	17	CI	97
WS6 1.6m	39	25	14	17	CI	97
WS9 1.8m	55	28	27	24	CH	100
WS10 1.8m		Non- Plastic		8.8		

Comments:

Authorised Signatories:
[ ] M. Aiston (Director)
[✓] G. Dresser (Director)

Signed:

For & on behalf of
Dunelm Testing Ltd

Unit 5E, Edwardson Road, Meadowfield, Durham, DH7 8RL

10258

Test Report: **Determination of Liquid Limit, Plastic Limit & Plasticity Index** BS EN ISO 17892-12:2018

Report Date: 23/10/23

Client: FWS
Unit 2 City West Business Park
St Johns Road Meadowfield

Lab ref: FWS 3959 23-7753

Client ref: FWS 3959

Date sampled: 16/10/23

Sampled by: Client

Site: Lepton

Date received: 16/10/23

Sample location: Various

Date test completed: 23/10/23

Material: Gravelly Clay

Test conducted by: DB/

Source of material: Site Arisings

Variation from Standard Method: None

Test Method: Clause 4.2

Cone Type: 80g/30◦

Method of sample preparation: Cl 5.26 (0.4mm removed by hand) 5.2.7 (0.425um washed)

Test Type: ~~1-Point~~/4-Point

Test Results: **Determination of water content of soil** in accordance with BS EN 17892:2014 Water Content

Test Ref/ Location	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Water Content (%)	Plasticity Class	Material Passing 425µm (%)
WS11@1.20m	42	23	19	15	CI	88
WS12@1.20m	43	23	20	14	CI	94
WS12@2.10m	41	25	16	26	CI	97
WS13@1.20m	39	23	16	11	CI	77
WS13@2.60m	39	20	19	16	CI	59

Comments

Signed:

For & on behalf of
G2M Testing Ltd

Authorised Signatories:
[] M. Aiston (Director)
[ ] G. Dresser (Director)
[✓] G. Batley (Laboratory Supervisor)

APPENDIX 10

NOTES ON LIMITATIONS

NOTES ON LIMITATIONS

1 FWS Consultants Ltd ("FWS") has prepared this report solely for the use of the client and/or his agent (the "Client") on the basis of exchange(s) of written proposals and instructions, and FWS accepts no responsibility or liability:-

a) for use of this report by any party other than the person for whom it was commissioned, or;

b) for the consequences of the report being used for any purpose other than that for which FWS was instructed to prepare it.

Should any third party wish to use or rely upon the contents of the report, written approval from FWS must be sought.

2 All information supplied by the Client, the Client's staff and professional advisers, local authorities, other statutory bodies, investigation agencies and publicly accessible databases, shall be provided to FWS in writing, and is accepted as being correct unless otherwise specified in writing by the discloser of the information.

3 The conclusions and recommendations in this report represent the professional opinions of FWS derived from currently accepted industry practices, and through the exercising of reasonable skill and care to be expected of a professional geosciences and environmental consultancy of similar size and experience. The assessments and judgments given in this report are directed by and limited to both the finite data on which they are based and the proposed works to which they are addressed.

4 Environmental and geotechnical desk studies comprise a study of available information obtained from various identified sources, authorities and parties. The information reviewed cannot be exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. For clarity, no independent verification of this data is carried out by FWS and it is accepted at face value. Any identified risks in desk study reports are perceived risks based on the information available at the time. Actual risks can only be assessed after carrying out a thorough physical investigation of the site that serves to validate such identified risks.

5 Data acquisition during site investigations is subject to the limitations of the methods of investigation used, site conditions and access constraints. Exploratory holes undertaken during fieldwork, particularly boreholes and/or trial pits, investigate a small volume of ground in relation to the size of the site and thus can only provide an indication of site conditions. The opinions provided and recommendations given in this report are based on the desk study information and ground conditions apparent at the site of each of the exploratory holes. There may be ground conditions elsewhere onsite that have not been disclosed by the investigation and which therefore have not been taken into account in this report. FWS will take all due care and make commentary on the adequacy of data collection and therefore the ability to highlight the presence or otherwise of exceptional conditions.

6 Owing to the natural variation of the systems that are being investigated, and the anthropological impact similarly changing through time, the findings and opinions in this report are relevant to the dates of the site works and should not be relied upon to represent conditions after a reasonable passing of time. Site conditions will change over time due to natural variations and human activities. The comments made on groundwater, surface water and soil gas conditions are based on observations made at the time that the site work was carried out. It should be noted that these conditions will vary owing to seasonal, tidal and meteorological effects. Variation in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, or subsequent developments or activities on the site or adjacent area.

7 The scope of the investigation, as agreed between FWS and the Client, was undertaken based on the specific development proposals of the Client and may be inappropriate to another form of development or scheme.

8 The opinions expressed in this report regarding contamination, geotechnical and/or waste assessments are based on simple statistical analysis and comparison with available guidance values. No liability can be accepted for the retrospective effects of any changes or amendments to these values.