

CONTROLLED WATERS RISK ASSESSMENT FOR RESIDENTIAL DEVELOPMENT ON LAND AT WATER'S EDGE, WHITEHAVEN

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81900R13/MAY 2023

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PROJECT NUMBER	8190	
PROJECT TITLE	Water’s Edge, Whitehaven	
CLIENT	Gleeson Homes Cumbria Rural Enterprise Centre Redhills Penrith Cumbria CA11 0DT	
REPORT TITLE	Controlled Waters Risk Assessment for Residential Development on Land at Water’s Edge, Whitehaven	
REPORT REFERENCE	8190OR13	
REVISION	Date	Checked
Rev00	11/05/2023	ML

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CONTROLLED WATERS RISK ASSESSMENT FOR RESIDENTIAL DEVELOPMENT ON LAND AT WATER'S EDGE, WHITEHAVEN

1 INTRODUCTION

1.1 Background

A Due Diligence report (Ref. 1) was carried out by FWS in April 2019 which identified potential contamination and soil gas risks from the former chemical works. A subsequent Phase I Preliminary Contamination Risk Assessment and the Phase II Ground Investigations that were carried out between 22 and 23 August 2019 and 20 to 23 January 2020 (Ref. 2), along with supplementary contamination and geotechnical (Ref. 3) investigations were carried out during November 2022.

Following initial submission of the Phase 1 and 2 Geoenvironmental Investigation report (Ref. 2) by the Client to address outstanding planning conditions, the Environment Agency (EA) provided a consultation response to the Local Planning Authority (Ref. NO/2020/113115/01-LO1, dated 8 December 2020) in which they raised a number of points and requests for additional information and risk assessments. Subsequent correspondence (Ref. NO/2022/114908/01-LO01, dated 9 December 2022) acknowledged the original designation of the site as a 'special site/ Part 2A site' was incorrect, but the Environment Agency were still requesting that a supplementary controlled waters risk assessment was undertaken due to the historical activities undertaken onsite.

A sampling and testing strategy for the proposed supplementary investigations was prepared (Ref. 5) and submitted to the Environment Agency for approval prior to undertaking any of the additional works. This sampling strategy was approved on 6 March 2023 (Ref. NO/2023/115114/01-L01) with the following additional commentary:

'We have reviewed the Sampling and testing strategy for the supplementary controlled waters investigations on land at water's edge, Whitehaven (ref: 8190OR09, dated 9 February 2023). The proposals for supplementary investigation and risk assessment review are acceptable and we wish to make the following comments:

- Purging groundwater installations (3 well volumes) is recommended prior to sampling and any field measurements can also be useful.*
- Recommend also undertaking total soils analysis for comparative assessment of leachate results required for tier 1 comparative qualitative analysis as per P20. There may be sufficient total soils data in the locations, but greater confidence for sample analysis and interpretation is enhanced when soils for total and leachate are retrieved from same sample spot.'*

To address the EAs request for supplementary controlled waters risk assessment, FWS Consultants Ltd (FWS) carried out a Supplementary Investigations (Ref. 4) at Water's Edge, Whitehaven (the 'Site') for Gleeson Homes (the 'Client') to provide information for the proposed residential development with domestic gardens and road infrastructure and address the outstanding Environment Agency request for assessment. The site location is shown on the Client's Site Plan, Appendix 1.2.

These investigations have been 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. 6) and BS5930:2015 “Code of Practice for Ground Investigations” (Ref. 7), DEFRA and Environment Agency’s guidance document “Model Procedures for the Management of Land Contamination” (CLR 11 2004) (Ref. 8) and Land Contamination Risk Management Guidance 2019 (Ref. 9), the NHBC “Guidance of Land Quality” (2021) (Ref. 10) and DEFRA “Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance” (2012) (Ref. 11).

This report presents a summary of the proposed development, the hydrogeological setting of the site, ground / groundwater conditions and the total soil / leachate soil and groundwater contamination sources determined by the previous and recent investigations, and a controlled waters risk assessment in accordance with the Environment Agency Hydrogeological Risk Assessment for Land Contamination (Remedial Targets Methodology; Ref. 15).

1.2 Objectives

The objectives of the controlled waters risk assessment from the recent EA correspondence and the condition 3 wording they are requesting supplementary assessment of the following:-

- Assess the environmental and hydrogeological setting of the site.
 - Leachate testing of made-ground or natural soils.
 - Further assessment of the hydraulic gradient of shallow perched groundwater in cohesive made ground and clays.
 - Further information on the hydrogeology of the made ground, clays and underlying bedrock in terms of water levels / hydraulic gradient over a seasonal period and water quality.
- Provide a qualitative contamination risk assessment in relation to the proposed development and wider environment.

1.3 Sources of Information

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

- URS Corporation Ltd, February 2008. Former Albright & Wilson Works, Whitehaven, Cumbria. Ref. MARP0002.
- Integra Consulting Engineers, May 2013. Geotechnical Ground investigation at Land at Former Rhodia Offices, High Road, Whitehaven, Cumbria For Story Homes, Ref. 2599.
- FWS Report, April 2019, 8190OR01. Due Diligence Report.
- FWS Report, March 2022, 8190OR03Rev2: Phase 1 and 2 Geoenvironmental Investigation for Residential Development on Land at Water’s Edge, Whitehaven
- FWS Report, November 2022, 8190OR08: Supplementary Ground Investigation For the Proposed Residential Development On Land at Water’s Edge, Whitehaven Additional Testing.
- FWS Report, February 2023, 8190OR09. Sampling and Testing Strategy for the Supplementary Controlled Waters Investigations on Land at Waters Edge, Whitehaven.
- FWS Report, April 2023, 8190OR12: Factual Report on Ground Investigation for Residential Development on Land at Water’s Edge, Whitehaven.

2 SITE DESCRIPTION

2.1 Location

The 1.4 ha site at National Grid Reference 296680E, 516290N is located off High Road at Water's Edge, Whitehaven, as shown on the Client's Site Plan, Appendix 1.2.

2.2 Topography and Site Features

The site is generally flat-lying at an elevation of around 93 m AOD in the north and northeast to around 96 m AOD in the southwest and is surfaced by demolition fill with localised hardstanding in the southeast. The site is situated on the crest of a south to north aligned topographic spur, where the ground slopes towards the coastal cliff edge approximately 400 m to the west, at around 50 m AOD (Salton Bay), and towards the Pow Beck located approximately 900 m to the east, at an elevation of around 10 m AOD.

At the time of the initial ground investigation (August 2019 and January 2020), the site contained three stockpiles (Stockpile 3 in the west, Stockpile 2 in central area, and Stockpile 1 in the northeast of the site). Since the previous investigations, it was understood that the original Stockpile 1 and 2 were disposed offsite, and original Stockpile 3 (renamed by the site management as Stockpile 1 on current drawings) has been retained on-site for reuse under an Environmental Permit.

The site is bordered by residential development to the north and east with derelict open space to the south and west.

3 HISTORICAL DEVELOPMENT OF THE SITE

The principal historic land use of this area has been the Rhodia Chemical Works, which operated between 1938 to 2005 (Ref. 2). The development site is located in the north-western corner of these chemical works, which was primarily used for offices and storage warehouses, with the main chemical process areas located to the south that are still currently derelict land following a sequence of investigations and focused remedial works in 2008 (Ref. 13). The only area for the former chemical works site to have been re-developed to date is the northern part of the former offices / stores area located immediately to the north of the current development boundary.

A summary of the site history is presented below and illustrated in Drawing 8190OD01 Appendix 1.1.:

- Pre-1850s to 1920s - Agricultural land.
- 1920s - Railway/sidings constructed in the southwest of the site.
- 1938 to 1957 - Building constructed in the north of the site as part of the development of the Rhodia chemical works, extending beyond the site boundary to the north, which is indicated to be a steel frame warehouse. 'L' shaped building constructed in the southeast of the site and indicated to be an office, with adjacent ancillary 'works' buildings and possible tanks/storage silos in the southeast and west as shown on Drawing 8190OD01Rev1, Appendix 1.1.
- Possible tanks/storage silos in the southeast and west have been removed by 1976 along with a number of the ancillary 'works' buildings in these areas.

- Railway/sidings in the southwest of the site have been removed by 1983.
- We understand that the main site operations ceased in 2005 and the majority of the former works buildings and infrastructure had been demolished and removed by 2012.

4 SUMMARY OF DESK STUDY REVIEWS

The following sections present details of the anticipated environmental setting of the site based on the desk study reviews (Ref. 2).

4.1 Geology

4.1.1 Made Ground and Superficial Geology

Made ground, relict structures and demolition fill was anticipated across the site associated with the previous industrial development of the site and subsequent demolition of the main office/warehouse/works buildings. Stockpiles comprising cohesive made ground and granular demolition arisings were recorded in the northern, central and western areas of the site as shown in Drawing 8190OD01Rev1, Appendix 1.1.

The site was indicated to be underlain by Glacial Till anticipated to be between 1 to 5 m thick.

4.1.2 Solid Geology

The solid geology comprises sandstones, mudstone and siltstones within thin coals belonging to the Whitehaven Sandstone Formation dipping in a northwesterly direction. The Bannock Band and Main Band Coals were anticipated at depths of 140 to 170 m, respectively.

4.2 Hydrology and Flooding

There are no surface water courses recorded within 250 m of the site.

The nearest surface water body is the North Sea below the Salton Bay cliffs approximately 400 m to the west. Approximately 500 to 600 m to the east and southeast of the site are recorded 4 sets of issues from the easterly facing slope, at an elevation of around 80 to 85 m AOD that drain towards the Pow Beck located 900 m to the east.

There are no surface water abstractions or discharge consents within 250 m.

The site does not fall into an area of Extreme Flooding from Rivers or Sea without Defences or Flooding from Rivers or Sea without Defences.

4.3 Hydrogeology

Only localised perched waters were expected at shallow depth within the thin (1-5m) predominantly cohesive till, with the main water table at depth within the Whitehaven Sandstone Formation. The main water table in the sandstone bedrock is expected to have an east to west hydraulic gradient towards the cliff edge located 400 m to the west of the site and a west to east gradient towards Pow Beck located 900 m to the east of the site. Based on the elevation of the

surface water issue to the east, it is expected that the ground water table in the sandstone is at an elevation of around 85 m AOD below the site.

There are no Groundwater Source Protection Zones or groundwater abstractions within 1 km of the site.

4.4 Additional Enquiries

Environment Agency

The Environment Agency identified the site is a Chemical works which manufactured chemicals, acids and surfactants. The main process areas to the south (excluding the offices / stores of the current and adjacent residential developments) were determined as a contaminated land site by Copeland Borough Council and as a 'Special Site' by the Environment Agency. As such the company Rhodia agreed to voluntarily remediate the site under a Remediation Statement, which was completed to remove the pollutant linkage to identified controlled water receptors. All that remains on site now are remnants and foundations of roads, plant and buildings (Appendix 6).

Local Authority/Petroleum Officer

The Former Albright & Wilson Works Remediation Statement (Ref. 13) have identified the current proposed development site was not part of the main processing areas of the Chemical Works and did not require any specific remediation works. It implies the site was predominantly utilised as office, warehouse and storage space.

The Remediation Statement (Ref. 11) split the adjacent chemical works site up into different Plots (A-G) as shown on Drawing SB/SQ/MCH, Appendix 1.2. The closest 2 plots to the site are Plot B to the southwest and Plot F to the southeast.

- Plot B is located to the southwest of the site boundary at an elevation of around 93 m AOD (i.e. down hydraulic gradient) and historically comprised the former coking works and imidazoline plant. It is reported in the remediation statement (Ref. 13) that given the historical land uses it was considered likely to contain contaminated soils and groundwater. Typically, coking works contamination comprises elevated concentrations of phenols, thiocyanate, cyanide, sulphate, sulphide, sulphur, and heavy metals. It was concluded that the ground conditions encountered did not present a significant risk to controlled waters as it was underlain by Whitehaven Sandstone which is not thought to be in connectivity to the rapid pathway to the coast via the St Bees Evaporites which are recorded further south. Also, it did not present a significant risk to human health as there were thick concrete slabs over most of the area and as such there is no pathway for the contaminants. As no significant pollution linkages were identified no remediation was undertaken for this Plot B area.
- Plot F is located to the southeast of the site boundary at an elevation of around 94 m AOD (i.e. down hydraulic gradient) and historically comprised an areas used for the storage of fuels, dyes and perfumes and subsequently for surfactant manufacturing. It is reported (Ref. 13) that during previous investigations of this area that localised groundwater contamination was present. As such, remediation works were undertaken in 2003 to address a historical spillage of fuel oils. Slightly elevated TPHs were subsequently recorded within the groundwater, however, the risks were reported to be marginal and further remediation of this area was

considered to be impractical. However, observations made during the investigation suggest there is the potential for free phase oils to be locally present in the shallow perched groundwater. As such, no remediation was undertaken for this Plot.

5 PREVIOUS INVESTIGATIONS

5.1 Summary of Previous Investigations

Previous investigations of this site are summarised below:-

2013 - Integra Consulting Engineers, Geotechnical Ground Investigation including a review of previous URS 2001 and 2003 ground investigations (6 window sample boreholes and one rotary open hole borehole) and supplementary geotechnical investigations including 47 trial pits, 6 cable percussive boreholes and 9 rotary open hole boreholes and geotechnical SPT and U100 testing (Ref. 12). The text of the main report and an exploratory hole location plan (which shows that the investigations were from a larger area than the current proposed development) have been provided for review. However, none of supporting appendices such as borehole logs, insitu or laboratory geotechnical testing data were available at the time of preparing this report. Therefore, we were only able to provide an outline review of the factual data presented within the text of the main report.

2020 – FWS Consultants Ltd – Phase 1 and 2 Geoenvironmental Investigation for Residential Development on Land at Water’s Edge, Whitehaven (8190OR03Rev01, Ref. 2)

The fieldwork was carried out between 22 and 23 August 2019 and subsequently 20 to 23 January 2020 and as shown in Drawing 8190OR11, Appendix 1.1 and comprised 5no window sample boreholes (mini-rig) to depths of 4.45 m bgl and 38no trial pits to depths of up to 3.5 m across the development site, with a further 21no trial pits within the three demolition fill stockpiles onsite and installation of gas and groundwater monitoring wells.

A copy of the exploratory hole logs is included in Appendix 2.1 and 2.2, the groundwater monitoring records in Appendix 3 and the analytical certificates in Appendix 4.1 and 4.2.

2022 – FWS Consultants Ltd – Supplementary Ground Investigation for the Proposed Residential Development On Land at Water’s Edge, Whitehaven Additional Testing (8190OR08, Ref. 3)

The fieldwork was carried out between 11 and 17 October 2023 and as shown in Drawing 8190OR11, Appendix 1.1 and comprised 4no. trenches to a depth of up to 1.50 m bgl to enable the made ground and natural soils in the vicinity of the hydrocarbon hotspot along the southwestern boundary to be examined.

A copy of the exploratory hole logs is included in Appendix 2.3 and the analytical certificates in Appendix 4.3.

2023 – FWS Consultants Ltd – Factual Report on Ground Investigation for Residential Development on Land at Water’s Edge, Whitehaven (8190OR12, Ref. 4)

The fieldwork was carried out between 8 and 10 March 2023 and as shown in Drawing 8190OR11, Appendix 1.1 and comprised 9no window sample boreholes to depths between 0.9 and 5 m bgl

and 2no machine excavated trial pits to depths between 1.1 and 3 m bgl in the vicinity of WS307 and installation of gas and groundwater monitoring wells.

A copy of the exploratory hole logs is included in Appendix 2.4, the groundwater monitoring records in Appendix 3 and the analytical certificates in Appendix 4.4.

5.2 Investigation Works Undertaken

The ground investigations undertaken by FWS in 2019, 2022, 2022 and 2023, included the following, as illustrated in Drawing 8190OD11 Appendix 1.1:

- 46 Trial pits to a depth of between 0.8 to 3.5 m to enable the made ground and natural soils to be examined and buried obstructions to be identified. In addition, TP105, 106, 126, 127, TT-A, TT-B, TT-C and TT-D were specifically located in the southwest of the site to further delineate the extent of hydrocarbon contamination associated with the relict drainage in this area.
- TP102 and 103 in the west and TP4, 117, 118 and 125 in the south were specifically located to investigate the area of the possible tanks and storage silos, respectively.
- TP101 and 104 were specifically located in the southwest of the site to investigate the area of the former railway.
- 5 mini percussion boreholes with Standard Penetration Testing (SPT) to a depth of between 2 to 4.45 m to enable the made ground and natural soils to be examined.
- Chemical and leachability testing of the insitu made ground, natural soils and groundwater.
- Installation of monitoring wells to enable groundwater level measurements.

5.3 Monitoring Undertaken

Details of the standpipes installed for ground gas and groundwater monitoring are summarised below.

Table 01: Installation Details:

Location	Area of Site	Estimated Elevation m AOD	Hole Depth m	Plain Pipe m	Slotted Pipe m	Monitored Material
WS2	Western	95.3	2.00	GL to 0.50	0.5 to 1.2	Made Ground – Granular
WS3	Central	95.0	2.95	GL to 0.50	0.5 to 1.3	Made Ground – Cohesive
WS5	Southwest	95.9	4.45	GL to 0.50	0.5 to 1.0	Made Ground – Granular
WS301	Central	94.5	3.50	GL to 0.50	0.50 to 1.30	Made Ground – Granular
WS302	Southern	96	4.70	GL to 1.00	1.00 to 4.70	Natural - Cohesive
WS303	Northern	93.2	5.00	GL to 1.00	1.00 to 5.00	Natural - Cohesive
WS304	Western	95.75	4.70	GL to 1.70	1.70 to 4.70	Natural - Cohesive
WS305	Southwestern	96	5.00	GL to 0.50	0.50 to 1.60	Made Ground – Cohesive
WS306	Western	95.75	4.00	GL to 0.50	0.50 to 1.40	Made Ground – Cohesive
WS308	Eastern	94.35	1.00	GL to 0.70	0.70 to 1.00	Natural - Granular
WS309	Eastern	94.3	0.90	GL to 0.60	0.60 to 0.90	Natural - Cohesive
TP02	Southeastern	94.65	3.00	GL to 1.00	1.00 to 3.00	Made Ground – Cohesive

Notes: Sandstone bedrock was encountered in BH307 at 1.2 m bgl, due to the made ground containing cobbles it was decided to excavate a trial pit and place the installation within the trial pit.

The results are presented in Appendix 3.

5.4 Chemical Testing

The following chemical soil analysis has been carried out by a MCERTS/UKAS accredited laboratory for the following suites of analysis:

- Schedule 1 (Soil Contamination Suite) – including arsenic, boron, total cadmium, total chromium, hexavalent chromium, copper, lead, mercury, nickel, zinc, pH, cyanide (total), organic matter content, chloride, sulphate (total and water soluble), TPH CWG (Ali/Aro split), BTEX & MTBE, PAH (USEPA 16), total phenols and asbestos ID.
- Schedule 2 (Soil Hydrocarbon Suite) – including TPH CWG and BTEX/MTBE suite.
- Schedule 3 (Soil Leachate Suite) – including arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pH, cyanide, organic matter content, total organic carbon, chloride, sulphate as SO₄, Sulphide, TPH CWG (Ali/Aro split), BTEX, MTBE, PAH (USEPA 16), phenols and hardness.
- Schedule 4 (Soil Leachate VOC/SVOC) – including VOC, SVOC and TICs.
- Schedule 5 (Groundwater Suite) – including arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pH, cyanide, total organic carbon, sulphate as SO₄, Sulphide, TPH CWG (Ali/Aro split), BTEX, MTBE, PAH (USEPA 16), phenols, VOC / SVOC + TICs and hardness.

5.4.1 Made Ground

As summarised below, chemical testing was carried out on selected soil samples and the results are included in Appendix 4.1, 4.2 and 4.3.

General Made Ground

- 2019 & 2020 – 26 samples of insitu made ground (13 granular made ground, 10 cohesive and one topsoil) at depths of between 0.1 to 0.7 m bgl, including two samples from the area of the possible tanks in the west, four samples from the possible tanks/storage silos in the southeast, and two samples from the area of the former railway in the southwest at depths between 0.3 and 2 m bgl for Schedule 1 (Soil Suite).
- 2023 – Seven made ground samples – one from granular made ground and six from cohesive made ground at depths of between 0.7 to 2.8 m bgl for Schedule 1 (Soil Suite). Thirteen made ground soil samples underwent leachate preparation and extraction – one from granular made ground, twelve from cohesive made ground for Schedule 3 (Leachate suite). In addition, the made ground samples were also tested for Schedule 4 (VOC/SVOCs).

Hotspot along Southwestern Boundary

- 2019&2020 - three made ground samples in the area of the localised hydrocarbon hotspot in the southwest at depths between 0.3 and 2 m bgl for Schedule 1 (Soil Suite).
- 2022 – seven made ground samples at depths between 0.3 and 2 m bgl were tested for Schedule 2 (Hydrocarbons Suite).

5.4.2 Superficial Soils

As summarised below, chemical testing was carried out on selected soil samples and the results are included in Appendix 4.4.

- 2023 – three natural superficial samples (one from natural sand / weathered bedrock and two from natural cohesive ground) at depths of between 0.8 to 1.5 m bgl for Schedule 1 (Soil Suite). Nine natural samples underwent leachate preparation and extraction – one from natural sand (weathered bedrock) and eight from natural cohesive ground for Schedule 3 (Leachate suite). In addition, the natural superficial samples were also tested for Schedule 4 (VOC/SVOCs).

Hotspot along Southwestern Boundary

- 2019&2020 – three samples of natural clay in the area of the localised hydrocarbon hotspot in the southwest at depths up to 2 m bgl for Schedule 1 (Soil Suite).
- 2022 – three natural cohesive soil samples at depths up to 2 m bgl were tested for Schedule 2 (Hydrocarbons Suite).

5.4.3 Groundwater

As summarised below, chemical testing was carried out on selected groundwater samples and the results are included in Appendix 4.4.

- Made ground – two groundwater samples (WS301 and WS306) were collected and tested for Schedule 5 (Groundwater Suite).
- Natural – two groundwater samples (WS302 and WS303) were collected and tested for Schedule 5 (Groundwater Suite).

It was not possible to undertake a 3 well purge on any of the installations as there was insufficient water to purge the wells due to very restricted and limited recharge, as such, samples were collected before purging the well dry. In addition, WS304 and WS305 could not be sampled as they had been lost during subsequent site enabling works, whilst WS308 and WS309 were dry so it was not possible to sample these installations. The installation in TP02 would not permit the sampling equipment to be progressed down hole beyond a depth of around 1 m.

6 ENVIRONMENTAL SETTING

6.1 Geology

6.1.1 Made Ground and Superficial Geology

The ground investigations (Refs. 2, 3, 4 and 5) have proven locally granular and predominantly cohesive made ground of between 0.3 and 1.5 m thick across the site. Locally in the southeast and southwest made ground extended to depths of up to 3.5 m bgl associated with the former silos and railway embankment as illustrated in Drawing 8190OD07, Appendix 1.

Cohesive Glacial Till was encountered beneath the made ground and was proven to extend to depths of up to 5 m bgl across the central and western parts of the site, whilst in the east and

southeast where either the made ground was locally thicker or shallow bedrock was encountered the glacial till was either thin or absent as illustrated in Drawing 8190OD08, Appendix 1

6.1.2 Solid Geology

The solid geology comprises sandstones, mudstone and siltstones within thin coals belonging to the Whitehaven Sandstone Formation dipping in a north-westerly direction. The Bannock Band and Main Band Coals are anticipated at depths of 140 to 170 m, respectively.

Weathered sandstone bedrock recovered as clayey gravelly sand was encountered between 0.4 and 1.6 m bgl in the southeast and 1 to 2.4 m bgl in the east of the site, underlain by competent sandstone bedrock at depths of between 0.8 and 2.4 m bgl in the southeast and 1.1 and 2.5 m bgl in the east.

Borehole BH204 (Ref. 13) located just off the southwestern corner of the current site as shown in Drawing 8190OD08, Appendix 1.1 was drilled in June 2003 and proved made ground to 0.7 m bgl, onto glacial till to 4.7 m bgl, then onto sandstone bedrock to a total depth of 35.5 m bgl.

6.1.3 Groundwater

Locally perched and laterally discontinuous groundwater was encountered at approximate elevations of between 92 to 95.5 m AOD in the made ground across parts of the site, and as isolated water strikes within the underlying natural superficial soils and bedrock, which are summarised in the table below:

Table 02: Summary of water encountered during ground investigations:

Hole	Date	Water Depth m	Inflow Speed	Strata
WS02	23/08/2019	0.40	Seepage	Made Ground - Granular
WS04	23/08/2019	0.30	Slow seepage	Made Ground – Granular
WS05	23/08/2019	0.30	Slow Seepage	Made Ground – Granular
TP01	22/08/2019	0.90	Slow Seepage	Made Ground – Cohesive
TP02	22/08/2019	0.70	Slow Seepage	Made Ground – Cohesive
TP02	22/08/2019	1.50	Rapid Inflow	Made Ground – Granular
TP03	22/08/2019	0.90	Slow Seepage	Made Ground - Granular at very weak sandstone interface
TP05	22/08/2019	0.50	Fast Seepage	Made Ground – Granular
TP05	22/08/2019	3.00	Rapid Inflow	Natural - Cohesive
TP06	22/08/2019	1.00	Fast Inflow	Made Ground - Cohesive
TP07	22/08/2019	0.30	Slow Seepage	Made Ground – Granular
TP09	22/08/2019	0.50	Slow Seepage	Made Ground – Granular
TP209	12/10/2022	3.00	Fast Inflow	Made Ground - Granular
TP210	12/10/2022	2.00	Damp	Weathered Bedrock
TP211	12/10/2022	0.80	Fast Inflow	Made Ground – Granular above concrete slab
TP212	12/10/2022	4.00	Fast Inflow	Weathered Bedrock
WS301	08/03/2023	1.00	Seepage	Made Ground – Granular
WS305	09/03/2023	0.40	Seepage	Made Ground - Cohesive
TP02	10/03/2023	2.70	Damp	Made Ground - Cohesive

Subsequent monitoring of the standpipe installations encountered locally, laterally discontinuous, perched groundwater in the made ground at depths of between 0.23 to 1.5 m bgl (93.15 to

95.56 m AOD) with an inferred hydraulic gradient from the topographical high in the west and southwest of the site radially to the south (beyond the site boundary) and to the east and northeast (across the site) as illustrated in Drawing 8190OD12, Appendix 1.

Only isolated groundwater has been recorded in the underlying natural superficial soils in the south of the site at a depth of 4.02 to 4.50 m bgl (91.5 to 91.98 m AOD), and elsewhere across the rest of the site no perched or laterally continuous groundwater has been proven in the cohesive superficial soils as illustrated in Drawing 8190OD13, Appendix 1.

No groundwater has been proven in the shallow bedrock encountered in the east and southeast of the site. However, borehole BH204 located to the southwest of the site noted that the made ground and glacial till were recorded as being damp, but with no groundwater seepages or ingress, whilst the sandstone was recorded as being damp at 17 m bgl with a water strike recorded at 31.5 m bgl rising to around 19.6 m bgl (estimated around 70 m AOD).

6.2 Hydrology and Flooding

There are no surface water courses recorded within 250 m of the site.

The nearest surface water body is the North Sea below the Salton Bay cliffs approximately 400 m to the west. Approximately 500 to 600 m to the east and southeast of the site are recorded 4 sets of issues from the easterly facing slope, at an elevation of around 80 to 85 m AOD that drain towards the Pow Beck located 900 m to the east.

There are no surface water abstractions or discharge consents within 1 km.

6.3 Hydrogeology

Based on the previous and recent investigations and subsequent groundwater level monitoring (Refs. 2 to 5), a laterally discontinuous shallow perched groundwater has been proven in the made ground across parts of the site that has an inferred hydraulic gradient from the topographical high in the west and southwest of the site, radially to the south (beyond the site boundary) and to the east and northeast (across the site). No laterally extensive or continuous groundwater has been proven in the underlying cohesive superficial deposits (defined as a Secondary Undifferentiated aquifer) and no shallow bedrock groundwater has been proven where bedrock was encountered within the depth of investigations in the east and southeast of the site.

Beneath the perched made ground groundwaters, there is an unsaturated superficial soil zone between 1 to >5 m thick and then a further unsaturated bedrock zone to a depth of between 20 to 31.5 m bgl. The main water table is at depth within the underlying Whitehaven Sandstone Formation bedrock and is classified as a Secondary A Aquifer.

From the geology and ground water conditions encountered, the hydrogeological model will comprise surface water infiltration into the predominantly cohesive and localised granular made ground across the site surface and predominantly discharging to surface water drainage or reducing by evapotranspiration, with the remainder infiltrating into underlying low permeability unsaturated zone of the cohesive Glacial Till and the shallow sandstone bedrock. Groundwater flow within the sandstone bedrock will likely be by fissure flow through the unsaturated zone to

the main sandstone aquifer at a depth of around 70 m AOD beneath the site. It is expected that the hydraulic gradient in the sandstone will be to the west due to the north to south orientated topographical spur, with groundwater discharges / issues occurring along the cliff edge located approximately 400 m to the west into the Irish Sea.

There are no Groundwater Source Protection Zones or 1 km within 1 km of the site.

6.4 Ecological Receptors and Sensitive Landuse

There are no ecological receptors or sensitive land uses within 250 m of the site.

7 DEVELOPMENT PROPOSALS

Buildings

The residential development is to comprise 40no detached and semi-detached properties as shown in Drawing 21201-D001-Rev2, Appendix 1.2. Finished floor levels between 93.65 m AOD (northwest) to 96.125 m AOD (southern boundary) are currently proposed.

Roadways

Construction of the carriageways and hardstand areas is expected to be undertaken within 0.85 m of the proposed finished floor levels of adjacent structures.

Earthworks

It is currently proposed to undertake a site turnover and regrade of site levels including a cut of 1,953 m³ and proposed fill of 3,751 m³, with an overall net shortfall of material of ~264 m³ to achieve the proposed formation level. This will involve the sequential excavation and reinstatement:-

- Removal of relic structures including all remaining pipework/infrastructure associated with the former tanks, and foundations, drainage and service ducts associated with the former works. Demolition arisings can undergo reprocessing by crushing and screening to generate Class 1 General Fill or Class 6F2 capping materials for re-use beneath buildings, hardstanding and road pavements to achieve the proposed site levels.
- Excavation of 1,953 m³ localised contaminated granular made ground (contaminated Class 1 General Fill) and localised contaminated cohesive made ground (contaminated Class 2 General Fill) and of natural clay (Class 2 General Fill or Class 4 Landscape Fill) as part of the site turnover and cut to the proposed sub-formation levels.
- Reinstatement of 3,751 m³ Site Won Contaminated Class 1 and 2 General Fill as an engineered fill to achieve the proposed subformation levels beneath carriageways, plots and garden areas.
- Excavation of localised contaminated granular made ground (contaminated Class 1 General Fill) and localised contaminated cohesive made ground (contaminated Class 2 General Fill) to cut the private drainage (1,534 m³) and foundation arisings (Volume TBC). From the earthworks materials balance and proposed phasing, it is anticipated that these arisings will require be reinstated beneath buildings and structures (as part of the construction make-up) and any surplus arisings will then be disposed offsite.

- Placement of 0.6 m thick anti-dig layer comprising compacted engineered fill and/or a geotextile membrane in the southwest of the site (Drawing 8190OD05, Appendix 1.1).

It is proposed (following consultation and agreement with the Environment Agency) to utilise 1,015 m³ of the topsoil materials in Stockpile 3 under a mobile plant licence and end of waste recovery operation as clean cover soils within garden and landscaped areas.

Landscaping

There will be public green space with new planting of trees and all properties will have domestic gardens. Therefore, where made ground materials are to remain insitu in future garden and landscaped areas they will need to be either contained beneath hardstanding / buildings or a designed clean cover soil layer. In addition, the POS area in the southwestern part of the site and selected gardens to Plots 27 to 28 where localised disseminated asbestos were proven in the made ground associated with the former railway (Drawing 8190OD01, Appendix 1.1) will incorporate an anti-dig layer as part of the clean cover design.

Sustainable Drainage

At this stage, an area of proposed offline cellular storage (1.2 m deep with minimum of 0.5 m cover and volume of up to 240 m³) is proposed in the POS area in the southwestern part of the site.

8 STAGE 2 CONTROLLED WATERS GENERIC QUANTITATIVE RISK ASSESSMENT

8.1 Summary Methodology

Initial generic screening was undertaken by making a comparison of measured chemical concentrations in soil, soil leachate, and groundwater against conservative screening criteria appropriate for a designated potential receptor and aimed to identify Potential Contaminants of Concern (PCoC) that could pose a potential risk to controlled waters. At the generic screening stage, no consideration is given to potential attenuation factors such as dilution, dispersion or biodegradation. In addition, this Controlled Waters Risk Assessment takes into consideration the proposed earthworks remediation, which is already proposed as part of the development i.e. removal of relict structures and drainage along with hydrocarbon contamination hotspot, so that the final risk assessment only considers the residual contamination that will be left insitu.

For this assessment, as there are no groundwater or surface water abstractions nor source protection zones within 1 km of the site boundaries, the main Controlled Waters receptor is considered to be the coastal water body (Irish Sea) located 375 m to the northwest / west of the site, where deep groundwater within the Whitehaven Sandstone Formation discharges via a series of springs and issues along the cliff edge. Therefore, the screening values that have been used the UK Waste Framework Directive (UK WFD) and UK Drinking Water Quality Standards (UK DWS) for soil leachate and shallow groundwater samples and are considered to be conservative. Where guidance for specific determinands is not available the hierarchy of sources listed in Appendix 7 have been used. Details of the sources of all Stage 2 screening criteria are given Appendix 6.1 (Soils) and Appendix 6.2 (Soil Leachate and Groundwater).

The results of all soil, soil leachate and groundwater chemical testing have been compiled into data tables, which are presented in Appendix 5. These tables present the minimum, mean, maximum

and US₉₅ (where applicable) concentrations of determinands for contaminants detected during the ground investigations and highlight determinands that exceed the Generic Assessment Criteria (Appendix 6).

A statistical analysis of the chemical results has been undertaken and the Upper Confidence Level 95th percentile concentrations (US₉₅ values) have been adopted as the source term concentrations for the Stage 2 assessment for soils and soil leachates, whilst all groundwater exceedances of Stage 2 criteria have been considered potential sources. In accordance with CL:AIRE (Ref. 14), where “outlier” concentrations indicative of hotspots have been identified, these sub-data sets have been considered separately. Based on an evaluation of the total soils chemical results, the data set has been separated into two subsets: the main General Site and the outlier Hydrocarbon Hotspot along Southwestern Boundary associated with the relict drainage route.

Where concentrations of contaminants exceeded the generic screening criteria, they have been evaluated further as part of this Stage 2 assessment.

8.2 Visual/Olfactory Evidence of Contamination

Localised slag and ash were recorded within the made ground across parts of the site. Localised hydrocarbon odours were recorded in made ground within TP1 and 9 / WS306 (northeast and northwestern / western areas, respectively) at depths between 0.4, 0.6 and 1.4 m bgl, respectively. No evidence of visual or olfactory contamination was reported across the rest of the site, with the exception of the hydrocarbon hotspot along the southwestern boundary as detailed below.

A strong solvent odour was recorded in TP6, 106 and 127 at depths of 0.3 to 1.5 m bgl along the south/southwestern boundary where a relict fireclay pipe was encountered. Immediately adjacent to the alignment of the relict drainage route, TT-A and TT-C noted strong hydrocarbon odours at depths of between 0.3 to 1.50 m bgl within the made ground / natural cohesive soils and localised oily staining at between 0.9 to 1.2 m bgl across the interface between the made ground and underlying natural cohesive soils. To the east and west of the relict drainage route alignment TT-B and TT-D did not note any significant visual or olfactory evidence of hydrocarbon contamination within the granular made ground and underlying natural cohesive soils.

Olfactory contamination was locally reported across parts of the site as summarised below:

Table 03: Olfactory contamination

Location	Depth - m	Odour Strength	Odour
General Site			
TP01	0.4 to 0.5	Weak	Hydrocarbon
TP09	0.4 to 0.6	Weak	Hydrocarbon
WS302	GL to 0.80	Weak	Hydrogen sulphide
WS306	GL to 1.40	Strong	Hydrocarbon
WS307	GL to 1.20	Weak	Hydrogen sulphide
Hydrocarbon Hotspot (Southwestern Boundary)			
TP06	1.50	Strong (associated with fireclay pipe)	Hydrocarbon / Solvent
TP106	0.3 to 0.6	Strong	Hydrocarbon / Solvent
TP127	0.8 to 1.10	Strong	Hydrocarbon / Solvent
TT-A	0.3 to 0.45 & 1.2	Strong	Hydrocarbon / Solvent
TT-C	0.5 to 1.5	Strong	Hydrocarbon / Solvent

8.3 Soils - Total Concentrations

The results of the chemical testing for total concentrations within the made ground and natural soils have been assessed (statistics tables included in Appendix 5.1, 5.2 and 5.3) to determine the main contaminants recorded at concentrations above Generic Assessment Criteria (Appendix 7.1).

The following concentrations of contaminants above the Generic Assessment Criteria were identified as detailed below:-

Table 04: Recorded Elevated Contaminants (Soils)

Location of Contamination	BH/TP No.	Sample Depth (m)	Material	Determinand	Maximum Concentration (mg/kg)	Generic Assessment Value (mg/kg)	Receptor
General Site	TP102 and TP103	0.1 to 0.3	Made Ground	Benzo(b)fluoranthene	4.8 (95th% 0.73)	2.6	Human Health
				Benzo(a)pyrene	5.6 (95th% 0.83)	2.2	
				Dibenzo(a,h)anthracene	0.4 (95th% 0.10)	0.24	
	TP09 TP101 TP102 TP103 TP104 TP124 TP125	0.5 0.4 0.3 0.1 0.6 0.3 0.3	Made Ground	Sulphate Aqueous Extract as SO4	1,500	500	Property
	None	--		None	--	--	--
	TP106 TT-A	0.4 0.4	Made Ground	Aromatic EC >12-16	1,600 (95th% 537)	660	Human Health and Property
	TP6 TP106	0.3 0.4		Aromatic EC >16-21	1,900 (95th% 675)	930	
Hydrocarbon Hotspot (Southwestern boundary)	TP105	0.7		Aromatic EC >21-35	5,000 (95th% 1,462)	1,700	
	TP105 and TP106	0.7 and 0.4	Natural	Sulphate Aqueous Extract as SO4	1,500	500	
	TT-A1	1.2		Aromatic EC >12-16	370 (95th% 188)	140	
	TP126	0.7		Sulphate Aqueous Extract as SO4	610	500	

8.4 Soils – Leachable Components

Selected soil samples were prepared to generate synthetic leachates, which were then chemically tested and assessed (statistics tables included in Appendix 5.4) to determine the main contaminants recorded at concentrations above Generic Assessment Criteria (Appendix 7.2).

The following concentrations of contaminants above the Generic Assessment Criteria were identified as detailed below:-

Table 05: Elevated Leachate Concentrations

Location of Contamination	BH/TP No.	Sample Depth (m)	Material	Determinand	Maximum Concentration (ug/l)	Generic Assessment Value (ug/l)	Receptor
General Site	WS301 WS302 WS304 WS305 WS306 TP02	0.1 to 2.8	Made Ground	Copper	5.4 (95th% 3.84)	1	Groundwater
				Aliphatic C12-C16	24 (95th% 5.53)	10	
				Aliphatic C16-C21	16 (95th% 4.66)	10	
				Aromatic C16-C21	12 (95th% 2.96)	10	
				Benzo(g,h,i)perylene	0.02 (95th% 0.0082)	0.0082	
	WS301 WS302 WS303 WS304 WS305 WS308 WS309	0.3 to 3.5	Natural	Copper	3.6 (95th% 2.97)	1	
				Nickel	39 (95th% 12.81)	34	
				Aliphatic C16-C21	17 (95th% 7.10)	10	
				Benzo(b)fluoranthene	0.1 (95th% 0.035)	0.017	
				Benzo(k)fluoranthene	0.02 (95th% 0.01)	0.017	
				Indeno(1,2,3-c,d)pyrene	0.03 (95th% 0.013)	0.00017	
				Benzo(g,h,i)perylene	0.11 (95th% 0.038)	0.0082	
				PAH	1.4 (95th% 0.87)	0.1	

8.5 Perched Groundwater

The results of the chemical testing programme for total concentrations within the perched shallow groundwaters have been assessed (statistics tables included in Appendix 5.5) to determine the main contaminants recorded at concentrations above Generic Assessment Criteria (Appendix 7.2). The following concentrations were found to be above the generic criteria.

Table 06: Elevated Groundwater Concentrations

Location of Contamination	BH/TP No.	Sample Depth (m)	Material	Determinand	Maximum Concentration (ug/l)	Generic Assessment Value (ug/l)	Receptor
General Site	WS301 WS302 WS303 WS306	0.50 to 1.30 1.00 to 4.70 1.00 to 5.00 0.50 to 1.40	Made Ground and Natural	Copper	18 (95th% 9.08)	1	Groundwater
				Nickel	100 (95th% 33.68)	34	
				Selenium	26 (95th% 13.38)	10	
				Zinc	60 (95th% 31.90)	10.9	
				Sulphate Aqueous Extract as SO4	1,100	500	
				Anthracene	2.9 (95th% 1.04)	0.1	
				Fluoranthene	28 (95th% 8.88)	0.12	
				Benzo(b)fluoranthene	31 (95th% 8.80)	0.017	

Location of Contamination	BH/TP No.	Sample Depth (m)	Material	Determinand	Maximum Concentration (ug/l)	Generic Assessment Value (ug/l)	Receptor
				Benzo(k)fluoranthene	9.8 (95th% 2.90)	0.017	
				Benzo(a)pyrene	24 (95th% 6.83)	0.27	
				Indeno(1,2,3-c,d)pyrene	19 (95th% 5.35)	0.00017	
				Benzo(g,h,i)perylene	16 (95th% 4.52)	0.0082	
				PAH	220 (95th% 68.85)	0.1	

8.6 Evaluation of Identified Soil Leachate and Groundwater Exceedances

8.6.1 General Site

Previous Investigations

Previous investigations undertaken across the site have proved the granular and cohesive made ground contained only localised contamination including elevated concentrations of sulphate aqueous extract, and localised elevated benzo(b)fluorene, benzo(a)pyrene, dibenzo(a,h)anthracene. None of the localised made ground topsoil or granular stockpiled made ground samples tested contained concentrations of contaminants above the generic assessment criteria.

Ground Conditions

The ground investigations (Refs. 2, 3, 4 and 5) have proven predominantly cohesive made ground of between 0.3 and 1.5 m thick across the central, northern and eastern areas of the site, which were previously occupied by offices, hardstanding and storage warehouses of low contamination potential. Locally in the southeast, in the areas of the former silos / tanks, and southwest, in the area of the former rail sidings, deeper made ground extended to depths of up to 3.5 m.

Firm to stiff cohesive Glacial Till of low permeability (with the exception of occasional thin sand interbeds immediately above the bedrock, no sand lenses or layers were proven) was encountered beneath the made ground and was proven to extend to depths of up to 4.45 m bgl across the central, northern and western parts of the site. Whilst in the east and southeast where either the made ground was locally thicker or shallow bedrock was encountered the glacial till was either thin or absent.

Groundwater Conditions

A laterally discontinuous shallow perched groundwater has been proven in the made ground across parts of the site with an inferred hydraulic gradient radially to the south (beyond the site boundary) and to the east and northeast (across the site). Beneath the locally perched made ground groundwaters, there is an unsaturated superficial soil zone between 1 to >5 m thick and then a further unsaturated bedrock zone to a depth of between 20 to 31.5 m bgl. The main water table is at depth within the underlying Whitehaven Sandstone Formation bedrock and is classified as a Secondary A Aquifer.

Visual/Olfactory Evidence of Contamination

Localised slag and ash were recorded within the made ground across parts of the site. Localised hydrocarbon odours were recorded in made ground within TP1 and 9 / WS306 (northeast and northwestern / western areas, respectively) at depths between 0.4, 0.6 and 1.4 m bgl, respectively. No evidence of visual or olfactory contamination was reported across the rest of the site associated with the historical office and warehouse structures, former railway, and tanks / silos, with the exception of the hydrocarbon hotspot along the southwestern boundary associated with the relict drainage encountered in this area, as detailed in Section 7.6.2, below.

Soils – Total Concentrations / Contamination

The investigations have proven only localised total contamination in the made ground or natural soil, although statistical analysis of the 95th percentile range confirmed that none of the samples exceeded the respective generic assessment criteria. No significant hydrocarbon contamination has been proven in the made ground, nor within the underlying natural cohesive soils across the general site.

As such there is no risk of a ‘a significant possibility of significant harm or impact’ to the proposed development or controlled waters.

Soils – Leachable Concentrations / Contamination

The recent investigations have proven the following leachable contamination within the made ground and natural soils across the site:

Made Ground

- Copper – elevated in both the made ground (5.4 ug/l; 95th% 3.84 ug/l) and natural soils (3.6 ug/l; 95th% 2.97 ug/l) above the generic assessment value (1 ug/l), indicating that the leachable concentrations determined are a result of the natural background concentrations in the glacial till and, as such, does not represent a contamination source i.e. samples of natural ground at depths of 0.5, 1.5 and 3.5 m bgl in WS303 all contained elevated leachable concentrations of copper even though no made ground was present in the vicinity of this exploratory hole. In addition, no significant elevated concentrations of total contamination have been proven in the made ground soils (maximum 360 mg/kg; 95th% 56.75 mg/kg).
- Localised elevated Aliphatic C12-16 & C16-21 (24 ug/l; 95th% 5.53 ug/l & 16 ug/l; 95th% 4.66 ug/l) and Aromatic C16-21 (12 ug/l; 95th% 2.96 ug/l) hydrocarbons are above the respective generic assessment value of 10 ug/l. However, the 95th% values are below generic assessment values and, therefore, does not present a contamination source. In addition, no significant elevated concentrations of total contamination have been proven in the made ground soils (maximum 6.7 mg/kg, 4.4 mg/kg and 64 mg/kg, respectively).
- Localised elevated PAHs (Benzo(g,h,i)perylene; 0.02 ug/l; 95th% 0.0082 ug/l) are above the generic assessment value of 0.0082 ug/l. However, the 95th% values are below generic assessment values and, therefore, does not present a contamination source. In addition, no significant elevated concentrations of total contamination have been proven in the made ground soils (maximum 3.8 mg/kg; 95th% 0.55).

Therefore, based on the leachability testing undertaken on a representative selection of made ground samples from across the site, no elevated leachable concentrations of contamination have been determined that would require further Stage 3 detailed quantitative risk assessment.

Natural

- Copper – see note above under made ground. The leachable concentrations determined are a result of the natural background concentrations in the glacial till and, as such, does not represent a contamination source. In addition, no significant elevated concentrations of total contamination have been proven in the made ground soils (maximum 29 mg/kg; 95th% 24 mg/kg).
- Localised elevated Nickel (39 ug/l; 95th% 12.81 ug/l) above the generic assessment value of 34 ug/l. No corresponding elevated total or leachable concentrations were determined in the made ground and the 95th% value is below the generic assessment value and, therefore, does not present a contamination source. In addition, no significant elevated concentrations of total contamination have been proven in the made ground soils (maximum 22 mg/kg; 95th% 17 mg/kg).
- Localised elevated Aliphatic C16-21 Hydrocarbons (17 ug/l; 95th% 7.10 ug/l) above the generic assessment value of 10 ug/l. However, the 95th% values are below generic assessment values and, therefore, does not present a contamination source.
- Localised elevated PAHs (Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-c,d)pyrene, Benzo(g,h,i)perylene) above the respective generic assessment values of 0.017 ug/l, 0.017 ug/l, 0.00017 ug/l and 0.0082 ug/l. No corresponding elevated total or leachable concentrations were determined in the made ground other than Benzo(g,h,i)perylene (0.02 ug/l made ground vs 0.11 ug/l natural) indicating that the elevated concentrations are unrelated to the overlying made ground and, as such, does not represent a contamination source i.e. samples of natural ground at depths of 0.5, 1.5 and 3.5 m bgl in WS303 all contained elevated leachable concentrations of PAHs even though no made ground was present in the vicinity of this exploratory hole.

Therefore, based on the leachability testing undertaken on a representative selection of natural ground samples from across the site, no elevated leachable concentrations of contamination have been determined that would require further Stage 3 detailed quantitative risk assessment.

Groundwater – Dissolved Concentrations / Contamination

Due to the limited recharge from the perched made ground and localised glacial till groundwaters encountered during the subsequent monitoring phase, it was not possible to undertake a full 3 well purge and well development prior to sampling.

Therefore, the elevated concentrations of contaminants noted and discussed further below are unlikely to be representative of the background groundwater quality and are likely to have been impacted by suspended sediment / solids / colloidal fraction.

This can be demonstrated by the reported PAH concentrations for Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene and Benzo(g,h,i)perylene that are all orders of magnitude higher in the groundwaters than the leachable concentrations determined and are also orders of magnitude above the respective solubility limits i.e. these reported concentrations could only be achieved in groundwater by inclusion of a proportion of suspended solids fraction and, therefore, does not provide a realistic representation of the dissolved phase groundwater condition that could impact deeper groundwater receptors. Only Anthracene and Fluoranthene concentrations are below the respective solubility limits, however, these also appear

to be impacted by suspended solids content and are orders of magnitude higher in the groundwaters than the leachable concentrations determined.

Recommendations

Therefore, based on the evaluation and assessment of the total soils, soils leachability and ground water testing undertaken on a representative selection of made ground and natural soil samples and locally perched groundwaters from across the site, no elevated leachable concentrations of contamination have been determined that would require further Stage 3 detailed quantitative risk assessment.

8.6.2 Hydrocarbon Hotspot along Southwestern Boundary

As recommended in Section 9.6.3 of the ground investigation report (8190OR03Rev2) and detailed in Sections 6.1 and 6.2 of the Remediation Method Statement (8190OR04Rev2), in order to mitigate potential longer-term risk to the development and controlled waters / wider environment, relict structures and drainage which still remain on site in areas of former buildings will need to be broken out and stabilised as part of site preparatory works including:

- Any redundant services and drainage which remain on site will need to be removed and 'grubbed-out' and if significant visual or olfactory evidence of contamination is noted during these works, then these areas should be further investigated, and gross contamination (free product and materials with visual or olfactory contamination) removed from the development platform prior to redevelopment.

On the basis that this contamination hotspot will be removed as part of the site enabling and subsequent development works, it is considered that no further Stage 3 detailed quantitative risk assessment is necessary.



A ROBINSON
PRINCIPAL CONSULTANT



M LAKEY
DIRECTOR

9 REFERENCES

- 1 FWS Consultants Ltd, April 2019. Due Diligence Report for Land at Water's Edge, Whitehaven, Ref. 8190OR01.
- 2 FWS Consultants Ltd, April 2020. Phase 1 and 2 Geoenvironmental Investigation for Residential Development on Land at Water's Edge, Whitehaven, Ref. 8190OR02.
- 3 FWS Consultants Ltd, November 2022. Supplementary Ground Investigation for the Proposed Residential Development on Land at Waters Edge, Whitehaven, Ref: 8190OR08.
- 4 FWS Consultants Ltd, April 2023. Factual Report on Ground Investigation for Residential Development on Land at Waters Edge, Whitehaven, Ref: 8190OR12.
- 5 FWS Consultants Ltd, February 2023. Sampling and Testing Strategy for the Supplementary Controlled Waters Investigation on Land at Waters Edge, Whitehaven, Ref: 8190OR09.
- 6 British Standards Institution, January 2001. BS 10175:2013, Investigation of Potentially Contaminated Sites – Code of Practice.
- 7 British Standards Institution, July 2015. BS 5930:2015, Code of Practice for Ground Investigations.
- 8 Environment Agency, 2004. Contaminated Land Report 11 (CLR 11) Model Procedures for the Management of Land Contamination.
- 9 Environment Agency, 2019. Land Contamination Risk Management Guidance 2019.
- 10 NHBC, 2021. NHBC Standards.
- 11 Department for Environment Food and Rural Affairs, Environmental Protection Act 1990:Part 2A, Contaminated Land Statutory Guidance, April 2012..
- 12 Integra Consulting Engineers, May 2013. Geotechnical Ground investigation at Land at Former Rhodia Offices, High Road, Whitehaven, Cumbria For Story Homes, Ref. 2599.
- 13 URS Corporation Ltd, February 2008. Former Albright & Wilson Works, Whitehaven, Cumbria. Ref. MARP0002.
- 14 CL:AIRE and The Chartered Institute of Environmental Health, May 2008. Guidance on Comparing Soil Contamination Data with Critical Concentrations.
- 15 Environment Agency, 2006. Hydrogeological Risk Assessment for Land contamination: Remedial Targets Methodology.

APPENDIX 1

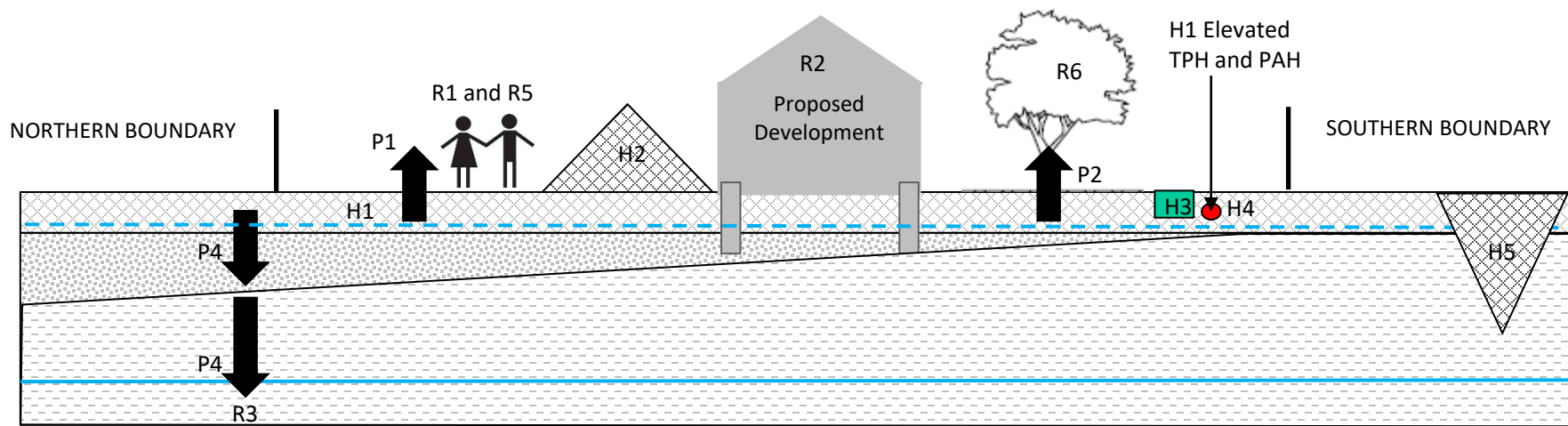
DRAWINGS

APPENDIX 1.1

FWS DRAWINGS



NOTES / KEY SITE LOCATION FOOTPRINT OF HISTORIC BUILDINGS DEMOLITION STOCKPILES WATERLOGGED GROUND		   		DRAWING TITLE SITE FEATURES PROJECT TITLE WATER'S EDGE, WHITEHAVEN	CLIENT GLEESON HOMES CUMBRIA STATUS FINAL DRAWN BY GH SCALE NOT TO SCALE	PROJECT NUMBER 8190 DATE April 2019 DWG. No. 81900001Rev1	 1 Redwood Crescent, Office 1-8, Peel Park East Kilbride South Lanarkshire G74SPA Tel: 01355 207 778 admin@fwsconsultants.com www.fwsconsultants.com
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Source of Hazard / Pollutant		Pathway		Receptor		Severity of Consequence	Probability of Occurrence	Level of Risk
H1	Made ground associated with the demolition of the former chemical works including hydrocarbon contamination recorded in the southwest associated with drainage pipe	P1	Inhalation, ingestion and dermal contact	R1 R5	Future End Users Construction Workers	Severe	Likely	High
		P2	Direct contact	R6	Plants/Landscaping (If proposed on future development)	Medium	Low Likelihood	Low
		P4	Leaching of contaminants vertically or laterally to groundwater	R3 R4	Perched Groundwaters Whitehaven Sandstone Formation - Secondary A Aquifer	Medium	Low Likelihood	Low
		P3	Soil gas or soil vapours pooling within the structures	R2	Property (Human Health in confined spaces)	Medium	Likely	Moderate
H2	Stockpiled made ground in the centre, north and west of the site	P1	Inhalation, ingestion and dermal contact	R1 R5	Future End Users Construction Workers	Severe	Likely	High
		P2	Direct contact	R6	Plants/Landscaping (If proposed on future development)	Medium	Low Likelihood	Low
H3	Elevated PAHs associated with the former tanks / silos in the west and southeast of the site	P1	Inhalation, ingestion and dermal contact	R1 R5	Future End Users Construction Workers	Severe	Likely	High
		P2	Direct contact	R6	Plants/Landscaping (If proposed on future development)	Medium	Likely	Moderate
		P4	Leaching of contaminants vertically or laterally to groundwater	R3 R4	Perched Groundwaters Whitehaven Sandstone Formation - Secondary A Aquifer	Medium	Low Likelihood	Low
		P3	Soil gas or soil vapours pooling within the structures	R2	Property (Human Health in confined spaces)	Mild	Likely	Low

NOTES / KEY



MADE GROUND



STOCKPILE



GLACIAL TILL



WHITEHAVEN SANDSTONE FORMATION

DRAWING TITLE

CONCEPTUAL SITE MODEL AND PRELIMINARY RISK ASSESSMENT

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

NT

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

Sept 2019

DRG. No.

8190D03Rev2

FWS Geotechnical & Environmental Consultants

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Office 1.8, Peel Park
East Kilbride
South Lanarkshire
G74 5PA

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admin@fwsconsultants.com www.fwsconsultants.com

Source of Hazard / Pollutant		Pathway		Receptor		Severity of Consequence	Probability of Occurrence	Level of Risk
H4	Contaminated made ground associated with the former railway in the southwest of the site including sulphate aqueous extract and asbestos	P1	Inhalation, ingestion and dermal contact	R1 R5	Future End Users Construction Workers	Severe	Likely	High
		P2	Direct contact	R6	Plants/Landscaping (If proposed on future development)	Medium	Low Likelihood	Low
		P4	Leaching of contaminants vertically or laterally to groundwater	R3 R4	Perched Groundwaters Whitehaven Sandstone Formation - Secondary A Aquifer	Medium	Low Likelihood	Low
		P3	Soil gas or soil vapours pooling within the structures	R2	Property (Human Health in confined spaces)	Medium	Likely	Moderate
H5	Landfill gas migration sourced form the backfilled coal pit to the south	P3	Soil gas or soil vapours pooling within the structures	R2	Property (Human Health in confined spaces)	Medium	Low Likelihood	Low

NOTES / KEY

- 
MADE GROUND
- 
GLACIAL TILL
- 
WHITEHAVEN SANDSTONE FORMATION


STOCKPILE

DRAWING TITLE

CONCEPTUAL SITE MODEL AND PRELIMINARY RISK ASSESSMENT

PROJECT TITLE

WATER’S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

NT

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

Sept 2019

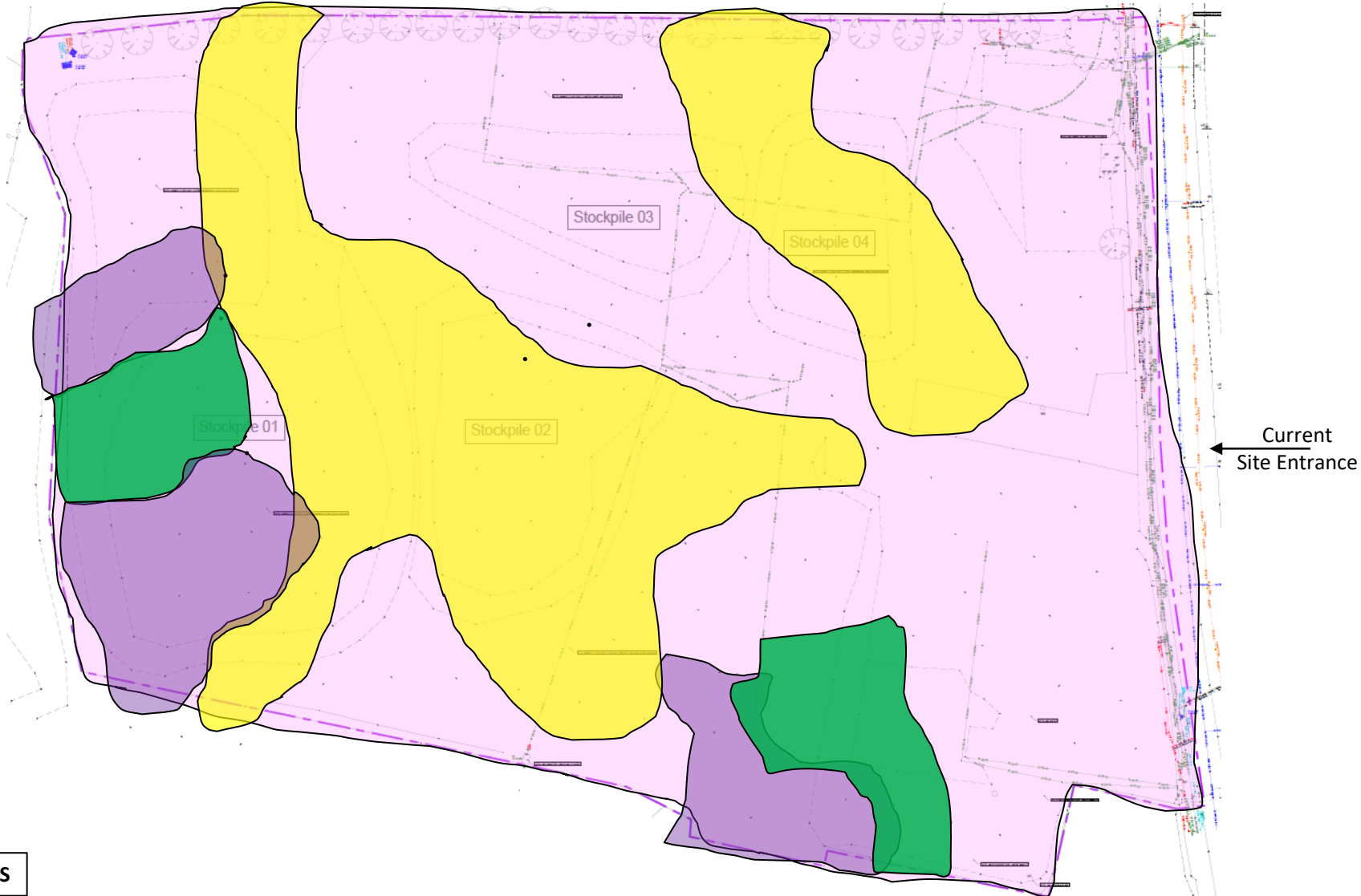
DRG. No.

8190OD03Rev01

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Geo-Environmental
Consultants

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MADEGROUND DEPTHS

NOTES / KEY			
< 1m		> 3 m	
1 – 2 m			
2-3 m			

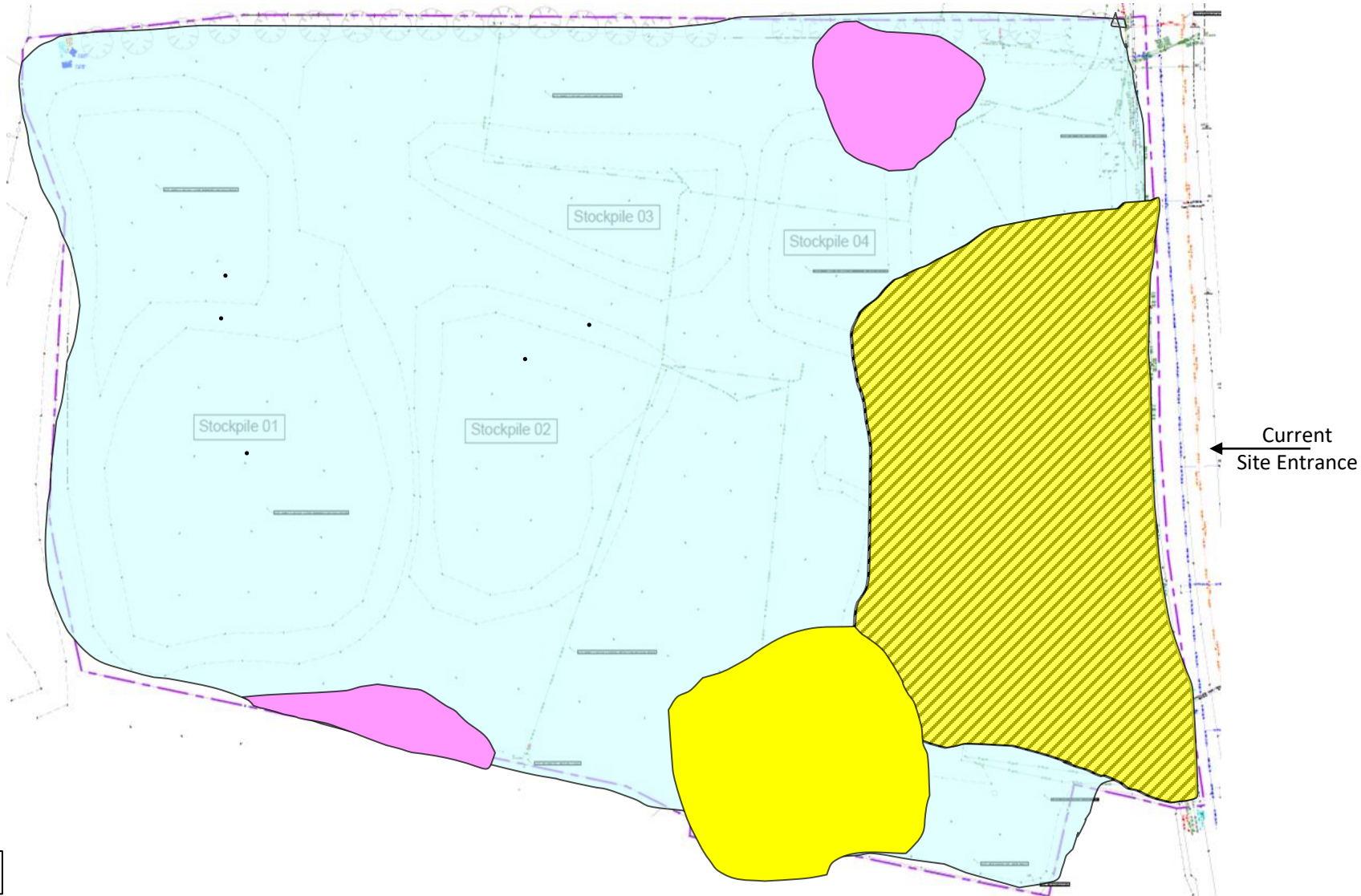
DRAWING TITLE
MADEGROUND THICKNESS/DEPTHS
PROJECT TITLE
WATER'S EDGE, WHITEHAVEN

CLIENT	
GLEESON HOMES CUMBRIA	
STATUS	PROJECT NUMBER
FINAL	8190
DRAWN BY	DATE
MC	February 2023
SCALE	DRG. No.
NOT TO SCALE	81900D07

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SUPERFICIAL DEPTH

NOTES / KEY		
<= 2m		➤ Shallow Bedrock (0.7 to 1.4m) 
>3m		
>4.5m		

DRAWING TITLE
SUPERFICIAL THICKNESS/DEPTHS

PROJECT TITLE
WATER'S EDGE, WHITEHAVEN

CLIENT
GLEESON HOMES CUMBRIA

STATUS
FINAL

PROJECT NUMBER
8190

DRAWN BY
MC

DATE
February 2023

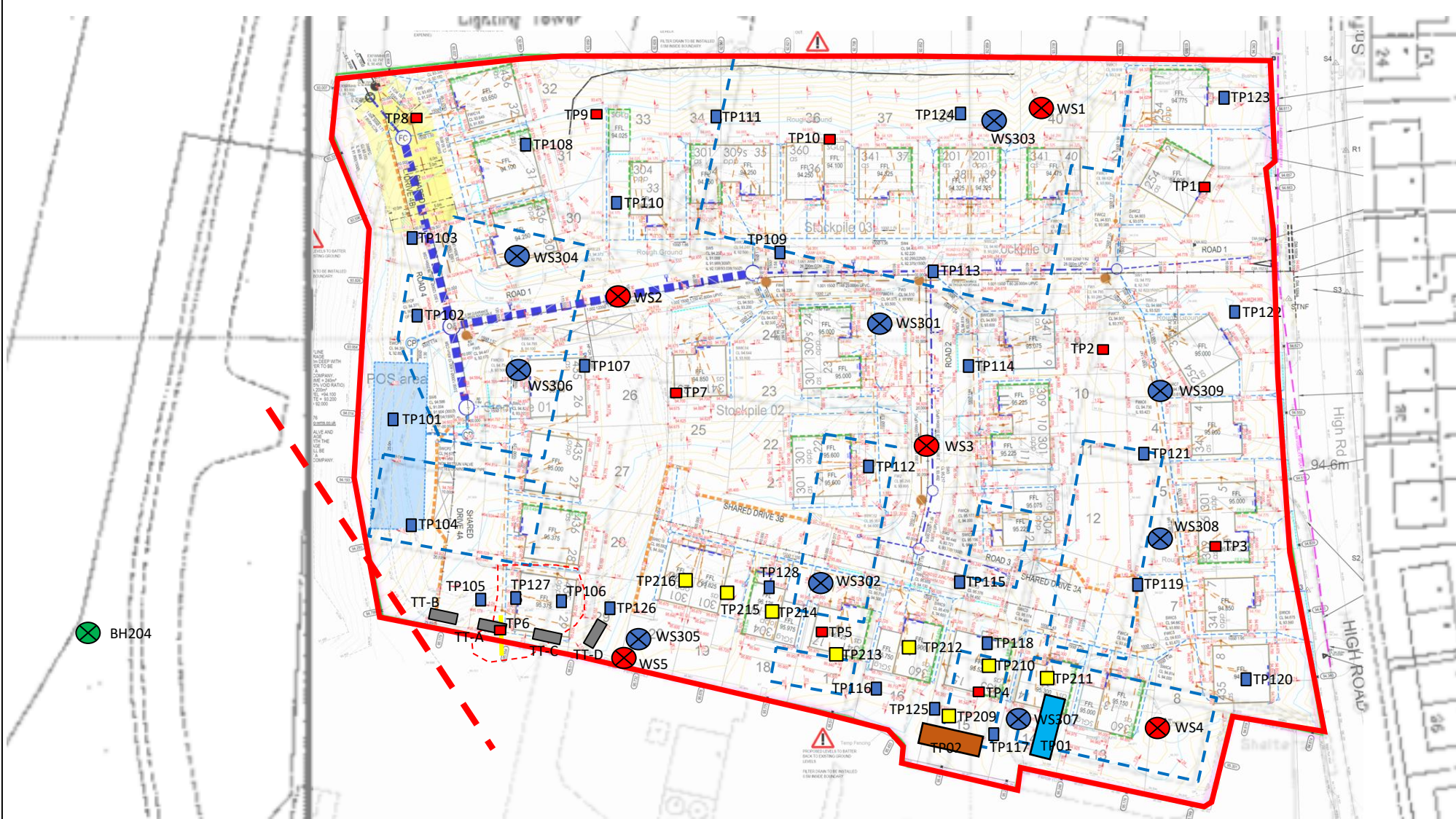
SCALE
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DRG. No.
81900D08

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NOTES / KEY

Site Location

Historical Buildings

Former Railway Embankment

Window Sample

Trial Pits

2019

2023

2019

2020

2022

DRAWING TITLE

COMBINED EXPLORATORY HOLE LOCATION PLAN

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

JR

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

March 2023

DRG. No.

8190OD11

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Office 1.8, Peel Park

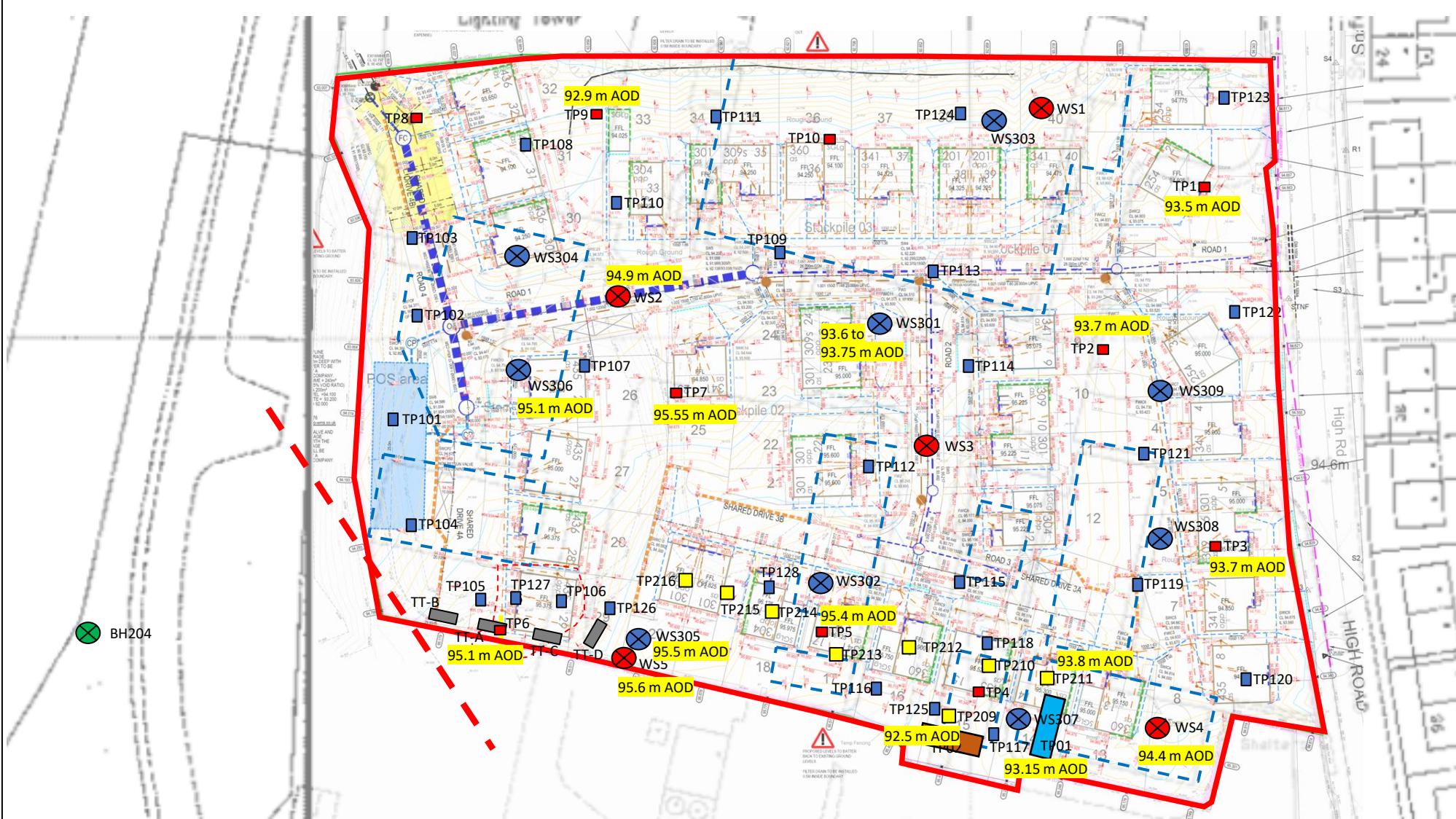
East Kilbride

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NOTES / KEY

Site Location

Historical Buildings

Former Railway Embankment

Window Sample

Trial Pits

2019

2023

2019

2020

2022

DRAWING TITLE

GROUNDWATER – MADE GROUND

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

JR

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

March 2023

DRG. No.

81900D12

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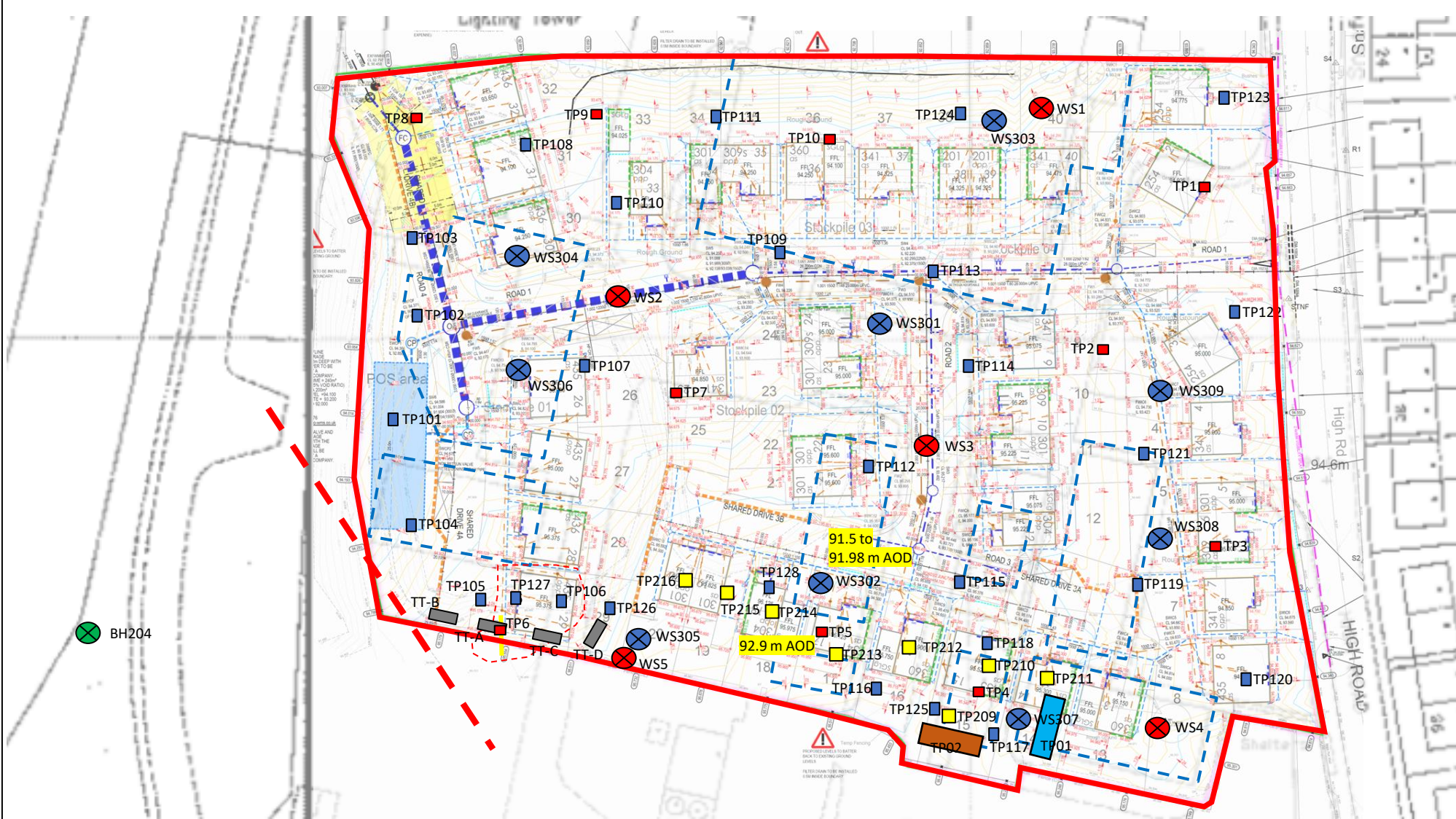
East Kilbride

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NOTES / KEY

Site Location

Historical Buildings

Former Railway Embankment

Window Sample

Trial Pits

2019

2023

2019

2020

2022

DRAWING TITLE

GROUNDWATER – SUPERFICIAL AND BEDROCK

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

JR

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

March 2023

DRG. No.

8190OD13

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Geotechnical & Environmental Consultants

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South Lanarkshire

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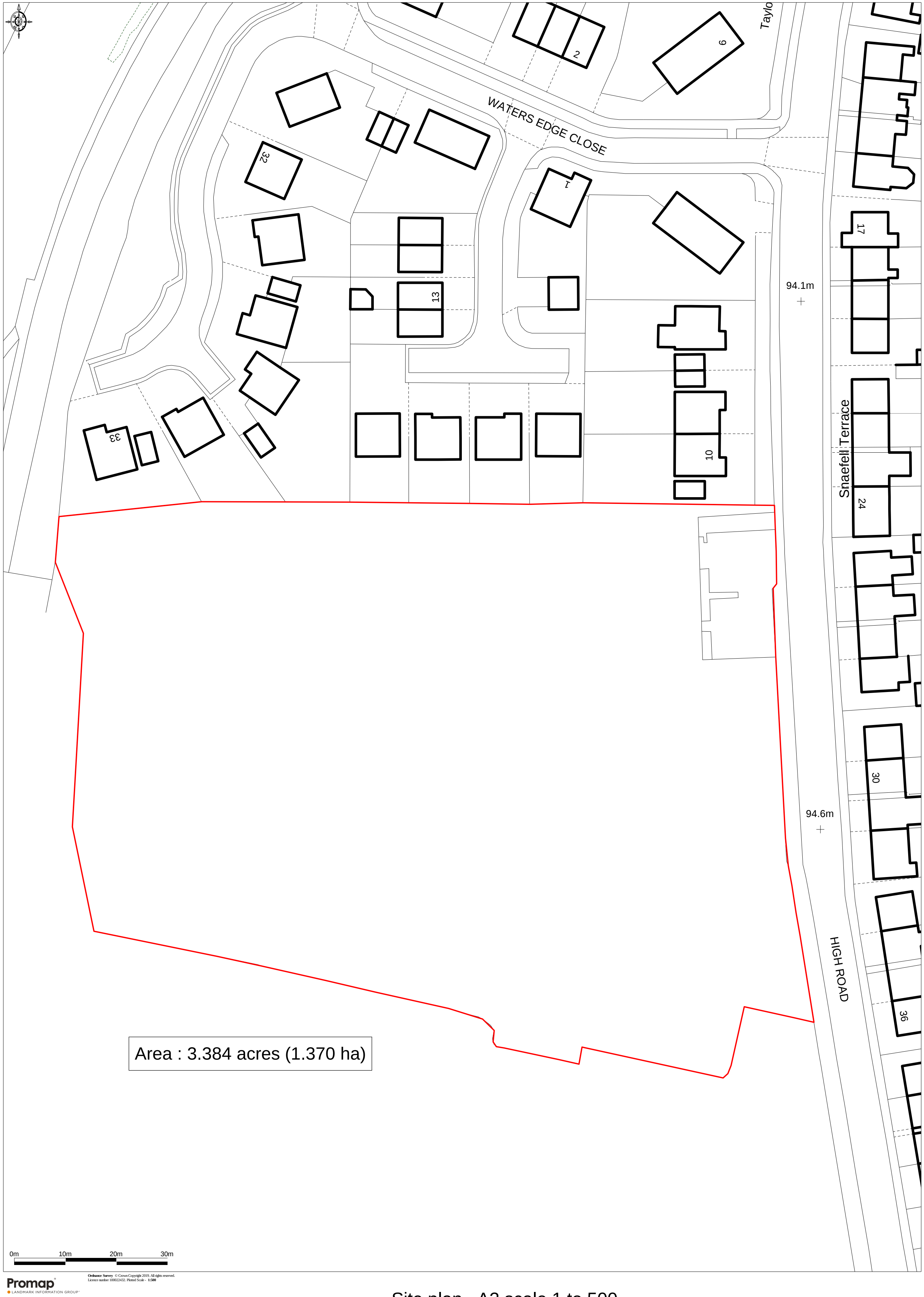
Tel: 01355 207778

admin@fwsconsultants.com www.fwsconsultants.com

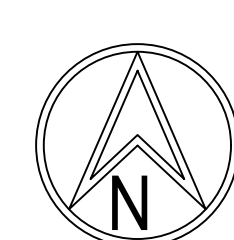
APPENDIX 1.2

THIRD-PARTY DRAWINGS

Water's Edge, High Road, Whitehaven CA28 9PD



Site plan - A2 scale 1 to 500



PROPOSED FOL & SURFACE WATER DRAINAGE TO
CONNECT INTO EXISTING MANHOLE (SEE SUBJECT
TO UNITED UTILITIES & SDA APPROVAL)

EXISTING DRAINAGE TO BE SURVEYED DOWNSTREAM TO
CONFORM CONNECTION PRIOR TO CONSTRUCTION

MANHOLES TO BE CCTV SURVEYED DOWNSTREAM PRIOR
TO WORK COMMENCEMENT & POST WORKS COMPLETION

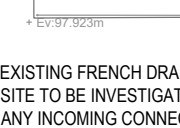
EXISTING MANHOLE MUST BE INSPECTED BY CLEN OF
WORKS INSPECTOR TO ENSURE THE MANHOLE CAN
ACCOMMODATE THE NEW CONNECTION AND IF ANY
REPAIRS ARE REQUIRED PRIOR TO WORKS
STARTING ON SITE IT MAY BE NECESSARY TO
RECONSTRUCT THE MANHOLE AT THE DEVELOPER'S
EXPENSE

SW/FC HYDROBRAKE DETAILS		
REFERENCE: MD SHE-0096-6030-2400-6000		
DESIGN HEAD: 2.4m		
OFFICE SIZE: 90m ²		
DESIGN FLOW: 0.0 l/s		
INVERT LEVEL: 90.800m		
TECHNICAL SPECIFICATION		
CONTROL POINT	HEAD (m)	FLOW (l/s)
PRIMARY DESIGN	2.400	6.000
FLUSH - FLO	0.416	4.700
KICK - FLO	0.860	3.700
MEAN FLOW	4.6	

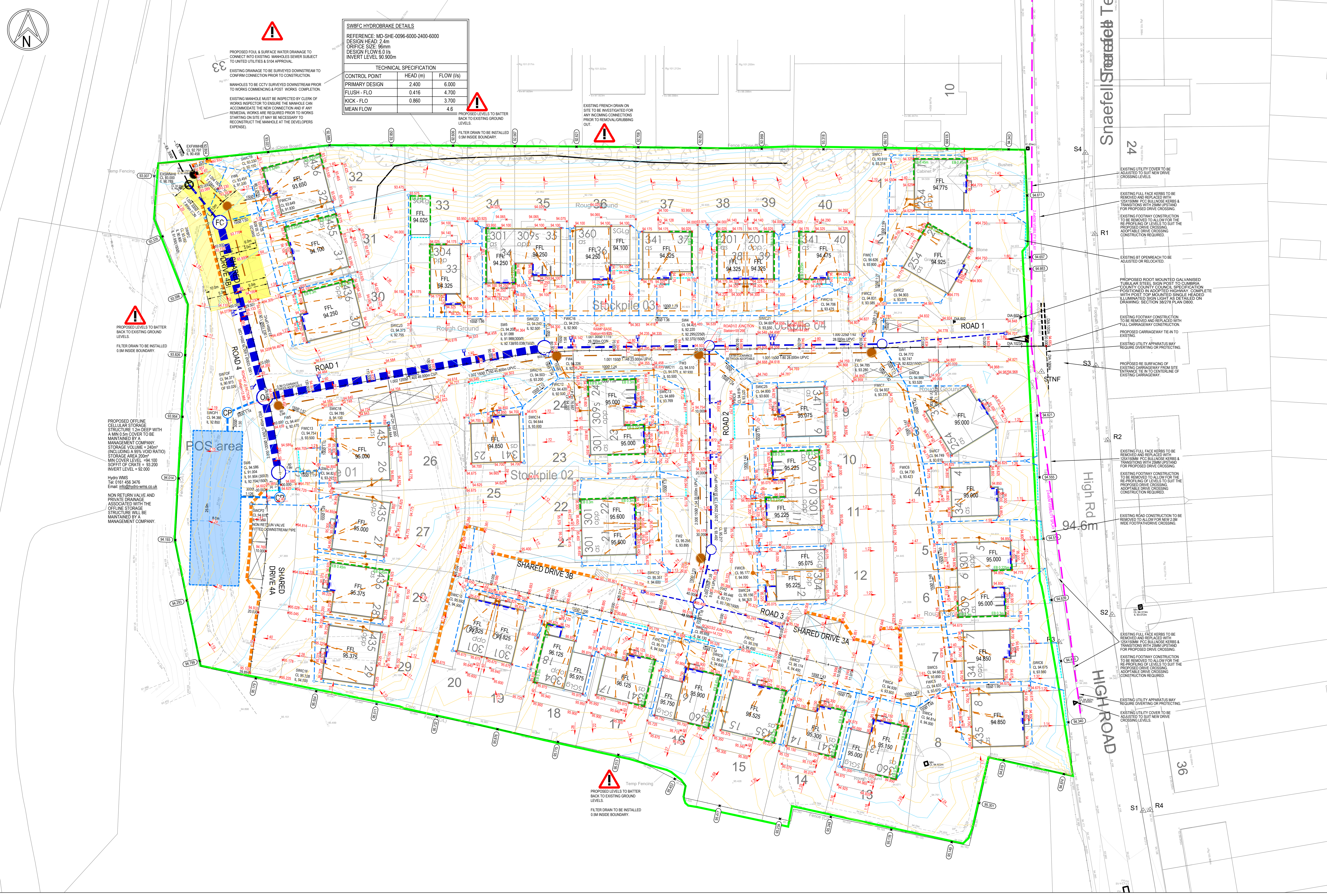


PROPOSED LEVELS TO BATTER
BACK TO EXISTING GROUND
LEVELS

FILTER DRAIN TO BE INSTALLED
0.1M INSIDE BOUNDARY



EXISTING FRENCH DRAIN ON
SITE TO BE INVESTIGATED FOR
NORMAN CONNECTIONS
PRIOR TO REMOVAL/REBURYING
OUT



DESIGN STRATEGY

SITE BOUNDARY - 1:5000 SCALES
APPROVED DRAINAGE STRATEGY TO 1:10000 SCALES
UNITED UTILITIES PRELIMINARY ENGINEERING REFERENCE: NOT REQUIRED AS CONNECTING INTO
STORY HOMES PROPOSED DRAINAGE NETWORK

ALTERNATIVE POST DEVELOPMENT SURFACE WATER DISCHARGE INTO STORY SITE: 1:500 SCALES

SURFACE WATER

- SURFACE WATER FROM THE PROPOSED DEVELOPMENT IS TO ULTIMATELY DISCHARGE INTO THE EXISTING SURFACE WATER SEWER WHICH IS LOCATED TO THE NORTH WEST CORNER OF THE SITE.
- SURFACE WATER DISCHARGE RATE IS TO BE RESTRICTED TO A POST DEVELOPMENT SURFACE WATER RATE OF 0.0 l/s. THIS IS IN ACCORDANCE WITH THE APPROVED DRAINAGE STRATEGY BY CHIEF ENGINEER AND THE REQUIREMENTS SET OUT BY THE ADJACENT DEVELOPERS.
- THE DISCHARGE RATE IS TO BE RESTRICTED USING A FLOW CONTROL UNIT WHICH APPLIES TO THE FLOW INTO THE LAST MANHOLE CHAMBER BEFORE CONNECTION INTO THE EXISTING SURFACE WATER SEWER.
- SURFACE WATER ATTENTION ON THE DEVELOPMENT IS TO BE PROVIDED IN THE FORM OF: 1. A FLOW CONTROL UNIT WHICH WILL PROVIDE FLOW CONTROL FOR THE 2400 LITRE FLOW RATE UP TO AND OFFLINE CELLULAR STORAGE WILL PROVIDE THE ADDITIONAL STORAGE FOR THE 1 IN 100 YEAR STORM EVENT, UP TO 10 IN 100 YEAR - 4% CLIMATE CHANGE - 10% URBAN CREEP STORM EVENT.
- SOURCE CONTROL OF POLLUTANTS IN HIGH RISK AREAS WILL BE PROVIDED BY FILTER DRAINER & CATCHPITS AT SHARED DRIVEWAYS. 2. TRAPS IN ACO CHANNEL DRAINENTS AND YARD GULLIES ON PRIVATE DRIVES. PRE TREATMENT OF HIGHWAY ROAD GULLIES AND CATCHPITS PRIOR AND AFTER THE OFFLINE STORAGE STRUCTURE.
- ALL MAN-APPROPRIATE SURFACE WATER DISCHARGE IS TO BE OFFERED TO UNITED UTILITIES FOR ADOPTION AND LIGUANCE DOCUMENTS.
- A MAINTENANCE COMPANY WILL BE REQUIRED TO ENSURE THE OFFLINE CELLULAR STORAGE STRUCTURE IS MAINTAINED.
- PROPOSED DRAINAGE AND CONNECTION SUBJECT TO APPROVAL & SDA AGREEMENT BY UNITED UTILITIES.

SOIL WATER

- PROPOSED SOIL WATER DISCHARGE RATE: 1.0 l/s.
- SOIL WATER FROM THE PROPOSED DEVELOPMENT IS TO ULTIMATELY DISCHARGE INTO THE EXISTING SURFACE WATER SEWER WHICH IS LOCATED TO THE NORTH WEST CORNER OF THE SITE.
- ALL MAN-APPROPRIATE SOIL WATER DISCHARGE IS TO BE OFFERED TO UNITED UTILITIES FOR ADOPTION AND LIGUANCE DOCUMENTS.
- PROPOSED DRAINAGE AND CONNECTION SUBJECT TO APPROVAL & SDA AGREEMENT BY UNITED UTILITIES.

DRAINAGE NOTES

- ALL PIPES 1500 UNLESS OTHERWISE STATED.
- ALL PRIVATE TO ADAPTABLE CONNECTIONS 1000 UNLESS OTHERWISE STATED.
- ALL PIPES IN TYPICAL AREAS TO HAVE 200mm COVER & CONCRETE SURROUND.
- ALL INTERNAL PIPES TO HAVE 200mm COVER & CONCRETE SURROUND.
- CONTRACTOR TO CONFORM WITH THE REQUIREMENTS OF THE DRAINAGE STRATEGY.
- THE DEPTH OF THE EXISTING SURFACE WATER SEWER SHALL BE DETERMINED BY THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY.
- FOR PIPE SPECIFICATION SEE REFER TO ADDITIONAL NOTES.
- VERTICAL CLAY PIPES & FITTINGS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN854 AND BS EN855 RESPECTIVELY AND BE ATTENDED ALL PIPES SHALL BE EXTRA STRENGTH TO BE 100% EQUIVALENT BS EN855 PIPE CROSSING STRENGTH.
- STRUCTURED WALL PLASTIC PIPES TO BE 100% EQUIVALENT BS EN855 PIPE CROSSING STRENGTH.
- PRECAST CONCRETE PRODUCTS SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN12451 AND BE ATTENDED ALL PRODUCTS TO BE CLASS 3 UNLESS NOTED OTHERWISE.
- GULLY GRATES AND FRAME SHALL COMPLY WITH THE RELEVANT PROVISIONS OF BS EN12451 AND BE OF A NON-SLIP DESIGN WITH CAPS TO BE REMOVED FOR MAINTENANCE. CLASS 3 GRATES FOR ROADS AND SERVICE VEHICLES AREAS. CLASS 2 GRATES TO BE USED IN CAR PARKING AREAS.
- ALL ROAD GULLIES & GRATES TO BE CLEANED & REPAIRED PRIOR TO COMPLETION OF WORKS.
- THE CONTRACTOR MUST ENSURE THAT ANY OF THE EXISTING DRAINAGE WHICH IS LEFT IN PLACE IS KEPT CLEAR OF GULLIES AND SHALL ALLOW FOR SETTING THROUGH THE NEW EXISTING DRAINAGE. PRIOR TO COMPLETION.
- CONTRACTOR TO TAKE MEASURES TO PROTECT HIS OPERATIVES WITH REGARD TO THE PRESENCE OF GAS IN SEWER TRENCHES AND MANHOLES THROUGH THE USE OF GAS MONITORING EQUIPMENT AND BREATHING APPARATUS AS REQUIRED.
- CONTRACTOR TO APPLY FOR SEWER PERMITS AND ROAD CLOSING PERMITS AS NECESSARY FROM THE APPROPRIATE AUTHORITY PRIOR TO COMMENCING WORKS.
- ADDITIONAL ELECTRICAL SPECIFICATION AND PROTECTION SHALL BE PROVIDED BY A SPECIALIST OPERATIONAL WED TO LAY LONGER LENGTHS.
- WHERE PIPES ARE INSTALLED PRIOR TO SETTING APPROVAL THEN LIGHT LINE COT SURVEY AND REPORT ARE REQUIRED PRIOR TO APPROVAL.
- WHERE A FIVE COVER FRAME HAS BEEN APPROVED, THIS MUST NOT BE COATED IN PLASTIC AND MUST HAVE LIFTING EYES SUITABLE SIZED TO ACCOMMODATE STANDARD LIFTING KEYS. DOWN COVER COVERS ARE NOT ACCEPTABLE.
- THERE SHOULD BE SUFFICIENT CLEARANCE TO ACCOMMODATE THE BEDDING FOR BOTH PIPES. APPROX 200mm. IF A CATCHPIT IS NEAR THE DRAINAGE THE CLEARANCE MUST BE INCREASED.
- THE MINIMUM COVERING STRENGTH FOR CLAY PIPES SHALL BE AS FOLLOWS: 10000 DA (MINIMUM DA), 10000 DA (MINIMUM DA), 10000 DA (MINIMUM DA). THE MINIMUM COVERING STRENGTH FOR CONCRETE PIPES SHALL BE: CLASS 100 TO EN 1996:2011-2002. PLASTIC PIPES SHALL CONFORM TO: CLASS 100 AND EN 1996:2011-2002. PLASTIC PIPES SHALL CONFORM TO: CLASS 100 AND EN 1996:2011-2002.

DESIGN NOTES

- ALL WORK TO COMPLY WITH CURRENT VERSION OF THE FOLLOWING DOCUMENTS:
 - DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB)
 - SPECIFICATION FOR HIGHWAY WORKS (SHPW)
 - LOCAL AUTHORITY DESIGN GUIDE AND SPECIFICATION
- PRIOR TO COMMENCING WORKS THE CONTRACTOR SHOULD INVESTIGATE AND LOCATE ANY NECESSARY ANY EXISTING UNDERGROUND EQUIPMENT WITHIN THE NEW AREAS AND DISCLOSE REQUIREMENTS FOR UNDERGROUND AND PROTECTION WITH THE RELEVANT UNDERGROUND OWNERS WITHIN THE PUBLIC HIGHWAY TO BE THE LOCAL AUTHORITY'S REQUIREMENTS.
- ALL WORKS WITHIN THE PUBLIC HIGHWAY TO BE THE LOCAL AUTHORITY'S REQUIREMENTS.
- CONTRACTOR TO APPLY FOR ROAD OPENING NOTICES ETC AS REQUIRED.
- CONTRACTOR TO ALLOW FOR LAB TESTS TO BE UNDERTAKEN IN AGREEMENT WITH THE LOCAL AUTHORITY HIGHWAY ENGINEER.
- PROPOSED LEVELS HAVE BEEN BASED ON THE EXISTING TOPOGRAPHICAL SURVEY BY GSA.
- PROPOSED DRAINAGE AREAS IN THE EXISTING TOPOGRAPHICAL SURVEY BY GSA.
- SLOPES GREATER THAN 1 IN 4 MAY REQUIRE STABILISATION. GEOTECHNICAL ENGINEER TO BE CONTACTED TO CONFIRM REQUIREMENTS.
- GARAGES SET 1.1M BELOW FFL UNLESS STATED OTHERWISE.

PIPE MATERIALS

- 1500/2000 UNPVC PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.

KEY

- 1500/2000 UNPVC PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.
- 200/250 CONCRETE PIPES TO BE BS EN12451 AND CERTIFIED TO WIS 4-01 & BS EN12451.

SUBJECT TO LOCAL AUTHORITY & WATER AUTHORITY APPROVAL

11/08/2022	ADDITIONAL DRAINAGE LABELS ADDED			
08/04/2022	FIRST ISSUE			
Date	Revisions			
Day State	INFORMATION			
NORTH EAST 0191 256622				
YORKSHIRE 0113 330 3300				
Client	GLEESON HOMES			
Project	WATERS EDGE, WHITEHAVEN			
Title	OVERALL ENGINEERING PLAN			
DO NOT SCALE	Scale @ A2: 1:250	Drawn	NN	Checked AE
Job No	21201	Day No	D001	

APPENDIX 2

EXPLORATORY HOLE LOGS

APPENDIX 2.1

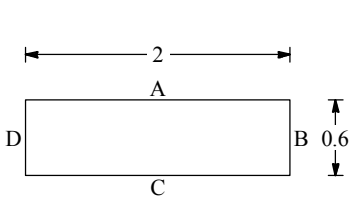
FWS 2019

TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP1
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1

A		B		C		D		Legend	
0								0	
1								1	
2								2	
3								3	

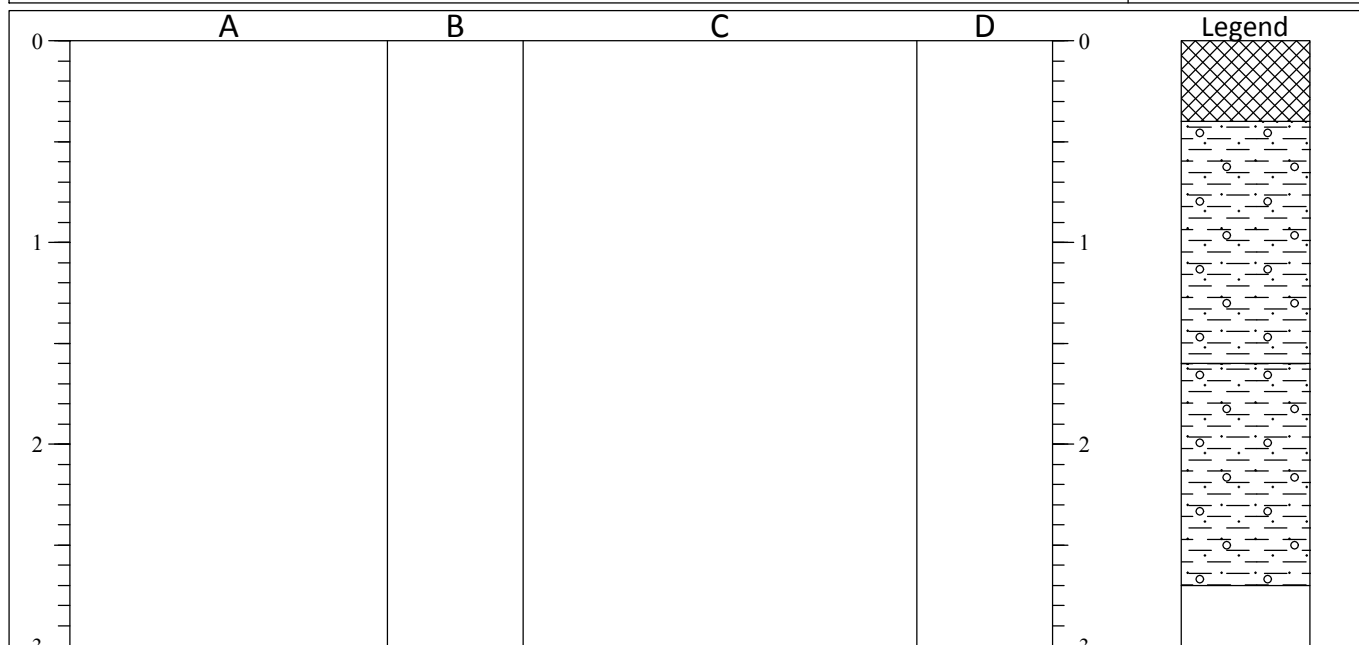
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Grey sandy fine to coarse angular to subrounded GRAVEL of limestone.	0.10	E1	
0.30-0.90		MADE GROUND: Firm brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone coal limestone and slag. 0.40 - 0.50 hydrocarbon odour	0.50	E2	
0.90-1.10		Greyish brown slightly clayey sandy fine to coarse angular to subangular GRAVEL of sandstone and mudstone.	0.60-0.80	B3	
1.10-2.90		0.90 Slow seepage Stiff greyish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and occasional coal. Cobbles are subrounded of sandstone.	1.00	E4	
			1.50-1.70	B5	
			2.50-2.70	B6	
2.90		END OF PIT (Difficult Progress - Very Stiff Clay)			

Shoring/Support: Stability: Stable 			GENERAL REMARKS	
			Slow seepage at 0.9 m bgl. Hydrocarbon odour noted from 0.4-0.5 m bgl.	

All dimensions in metres Scale 1:43.75	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP10
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



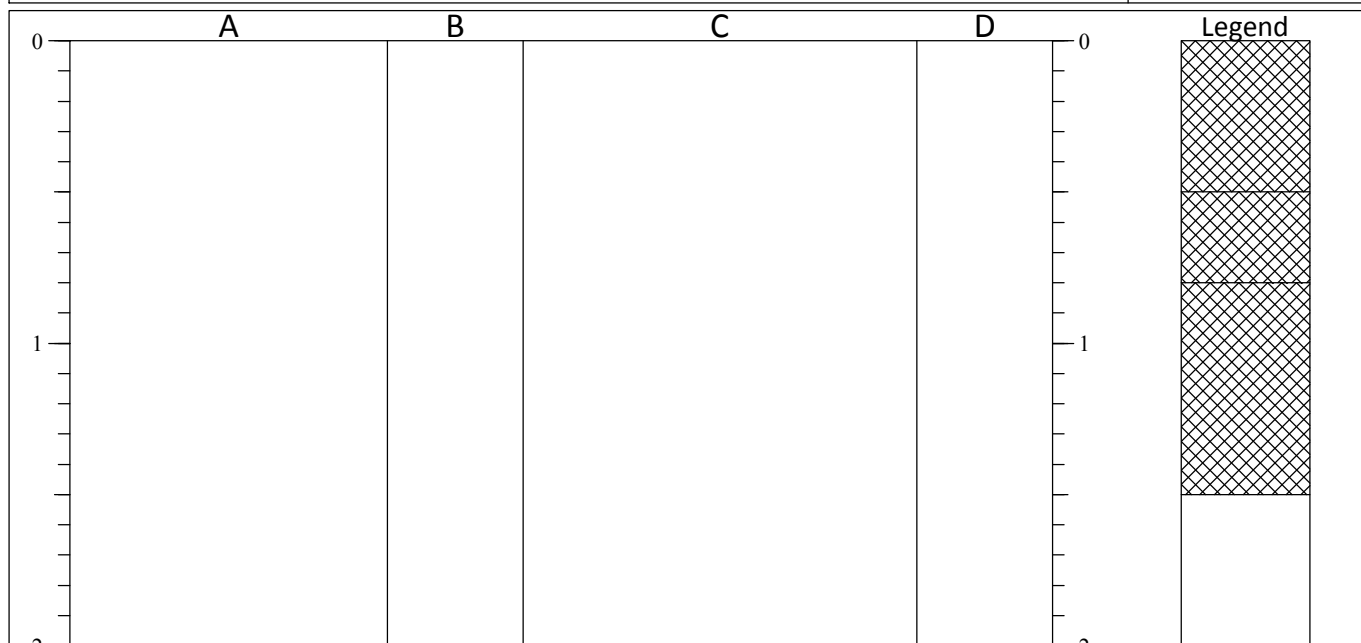
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		MADE GROUND: Firm brown mottled grey and orange sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone coal and occasional concrete.	0.20	E1	
0.40-1.60		Firm brown mottled grey and orange sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal. 1.00 - 1.60 becomes stiff	1.00-1.10	B2	
1.60-2.70		Stiff dark brown occasionally mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and occasional coal. 2.00 - 2.70 becomes very stiff	2.00-2.10	B3	
2.70		END OF PIT (Difficult Progress - Very Stiff Clay)			

Shoring/Support: Stability: Stable 			GENERAL REMARKS No visual or olfactory signs of contamination. No groundwater encountered during excavation.	
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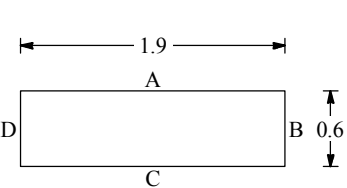
All dimensions in metres Scale 1:37.5	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP2
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



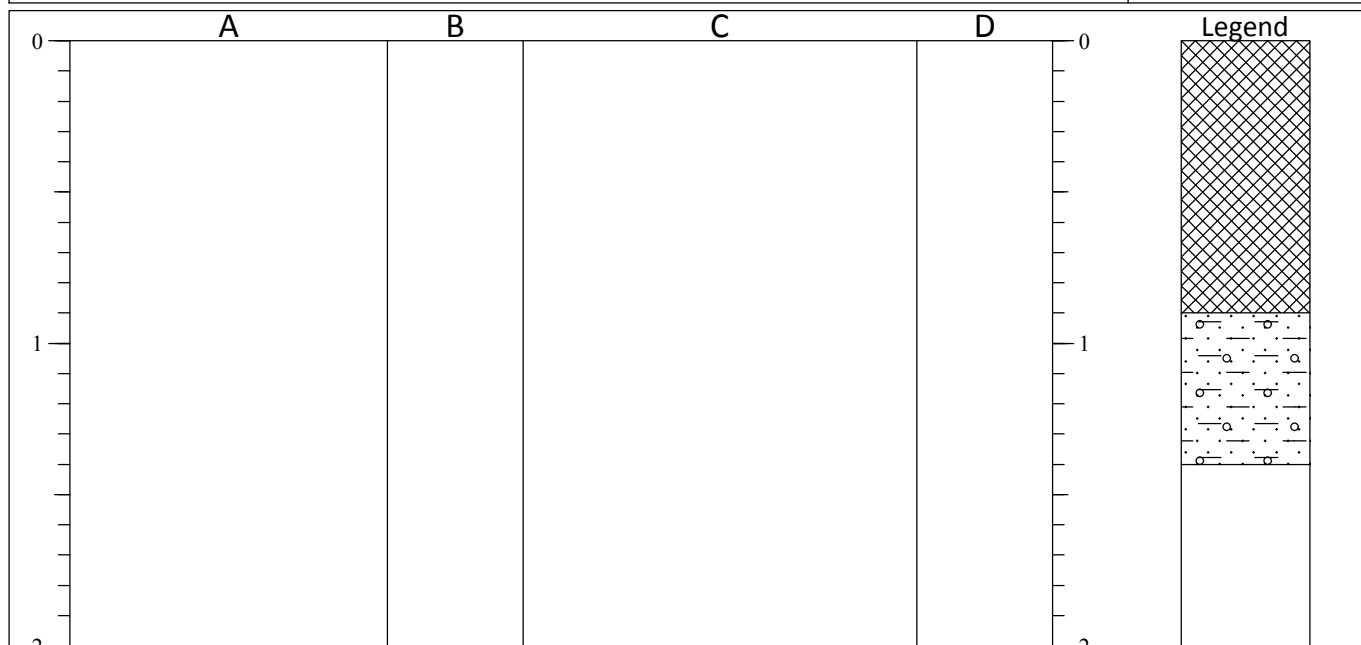
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Greyish brown sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone limestone coal slag concrete ash brick and metal with roots and rootlets.	0.20	E1	
0.50-0.80		MADE GROUND: Firm blackish brown sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone coal slag and ash. 0.70 Fast groundwater seepage	0.50	E2	
0.80-1.50		MADE GROUND: Grey sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone limestone coal slag concrete ash brick and plastic with low cobble content. Cobbles are subangular to subrounded of brick and concrete.	1.00	E3	
1.50		END OF PIT (Groundwater Inundation)			

Shoring/Support: Stability: Unstable from 0.8-1.5 m bgl			GENERAL REMARKS No olfactory signs of conamination. Fast groundwater seepage a 0.7 m bgl.

All dimensions in metres Scale 1:25	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP3
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



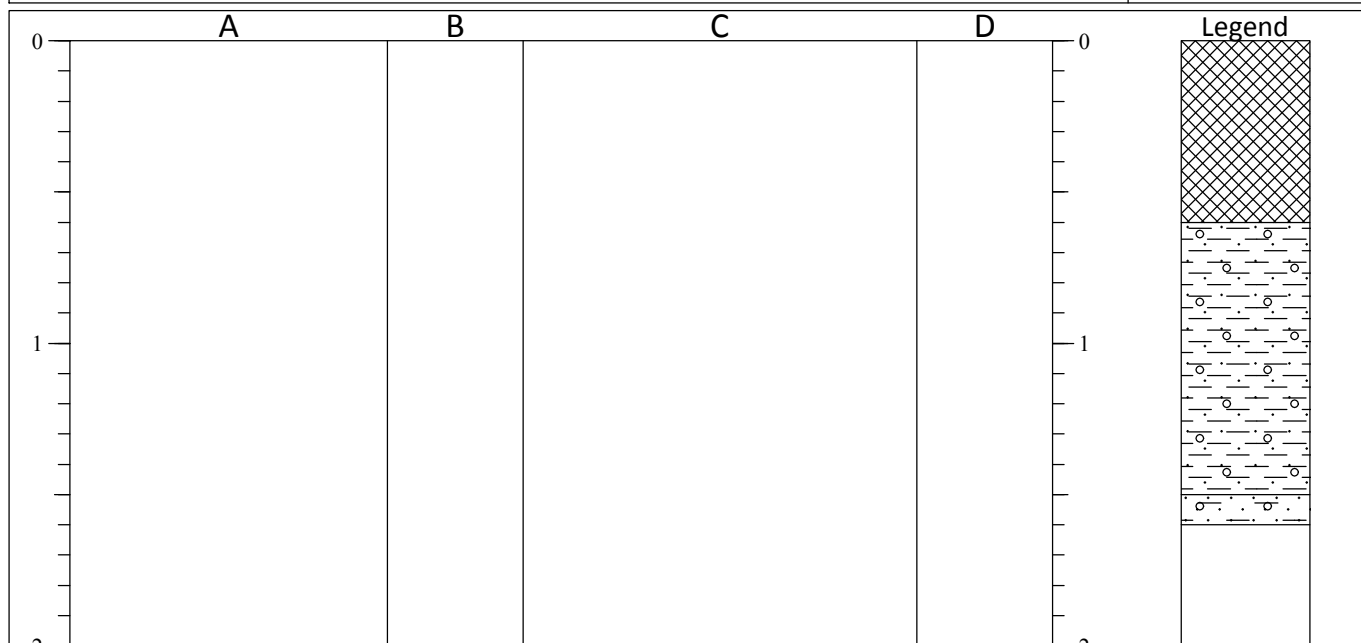
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.90		MADE GROUND: Grey sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone limestone coal slag concrete ash brick and plastic with low cobble content. Cobbles are subrounded of concrete and slag.	0.60	E1	
0.90-1.40		Destructured sandstone bedrock recovered as - Reddish brown slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone. 0.90 slow groundwater seepage 1.10 - 1.40 high cobble content	1.00	E2	
1.40		END OF PIT (Obstruction - Competent Sandstone Bedrock)			

Shoring/Support: Stability: Stable 			GENERAL REMARKS No olfactory signs of conamination. Slow groundwater seepage at 0.9 m bgl.	
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All dimensions in metres Scale 1:25	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP4
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		MADE GROUND: Dark grey very gravelly fine to coarse SAND with low cobble content. Gravel is fine to coarse angular to subrounded of sandstone mudstone limestone concrete and brick. Cobbles are subangular to subrounded of concrete and brick.	0.40	E1	
0.60-1.50		Soft dark brown slightly gravelly sandy CLAY with pockets of peat. Gravel is fine to coarse subangular to subrounded of sandstone.	0.80	E2	
			1.20-1.30	B3	
1.50-1.60		Destructured sandstone bedrock recovered as - Reddish brown slightly clayey very gravelly fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone.			
1.60		END OF PIT (Obstruction - Competent Sandstone Bedrock)			

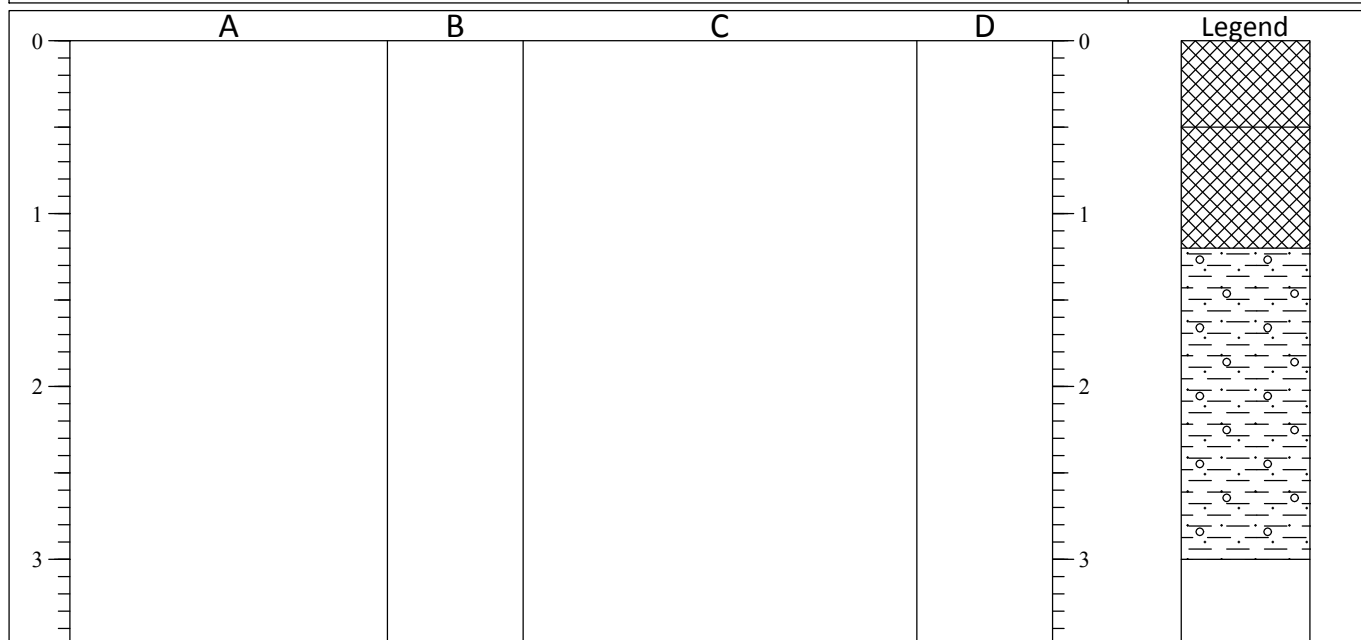
Shoring/Support: Stability: Stable 				GENERAL REMARKS	
				No visual or olfactory signs of contamination. No groundwater encountered during excavation.	

All dimensions in metres Scale 1:25	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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AGS3 UK TP NEW 8190 TP LOGS.GPJ AGS3 ALLGDT 12/9/19

TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP5
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



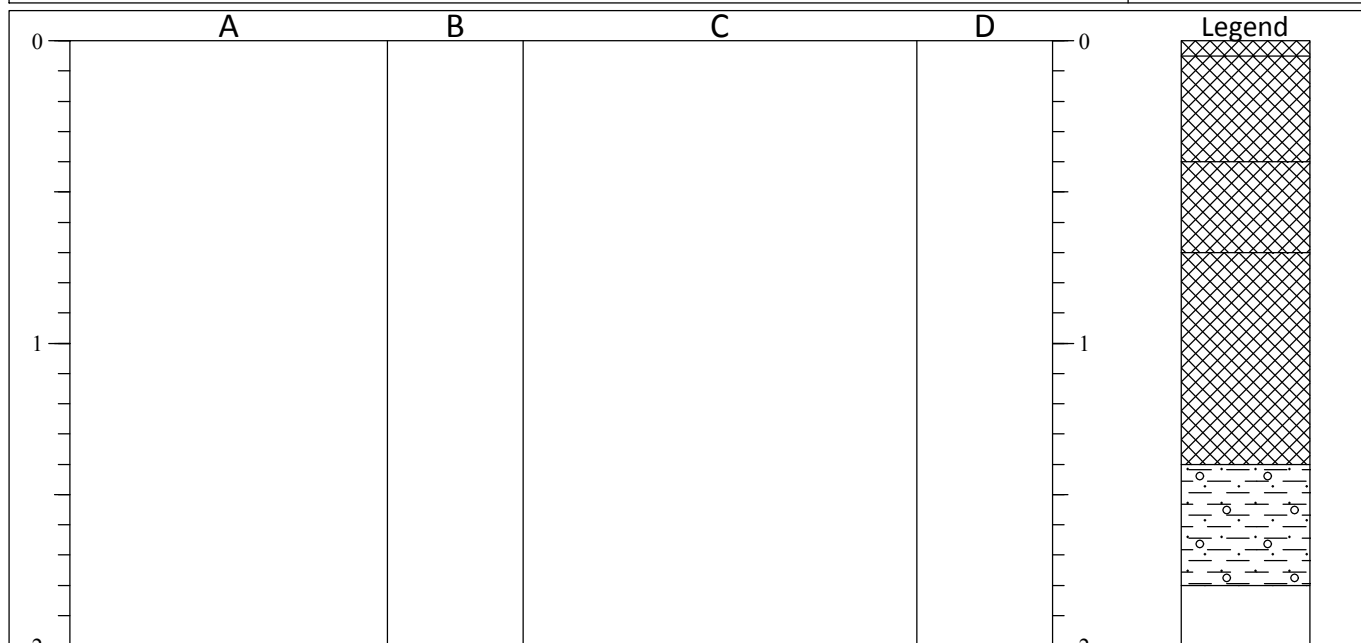
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Grey very gravelly fine to coarse SAND with medium cobble content. Gravel is fine to coarse angular to subrounded of sandstone mudstone limestone concrete slag wood and brick. Cobbles are to subrounded of concrete and slag.	0.10	E1	
0.50-1.20		MADE GROUND: Grey clayey sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone limestone coal slag concrete and brick. 0.50 - 1.20 fast groundwater seepage			
1.20-3.00		Soft reddish brown sandy very gravelly CLAY with pockets of peat and low cobble content. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal. Cobbles are subrounded of sandstone and mudstone. 2.00 becomes firm	1.20	E2	
			2.40-2.50	B3	
3.00		END OF PIT (Groundwater Inundation)			

Shoring/Support: Stability: Stable 			GENERAL REMARKS No olfactory signs of conamination. Fast groundwater seepage at 0.5 to 1.2 m bgl.	
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All dimensions in metres Scale 1:43.75	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP6
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



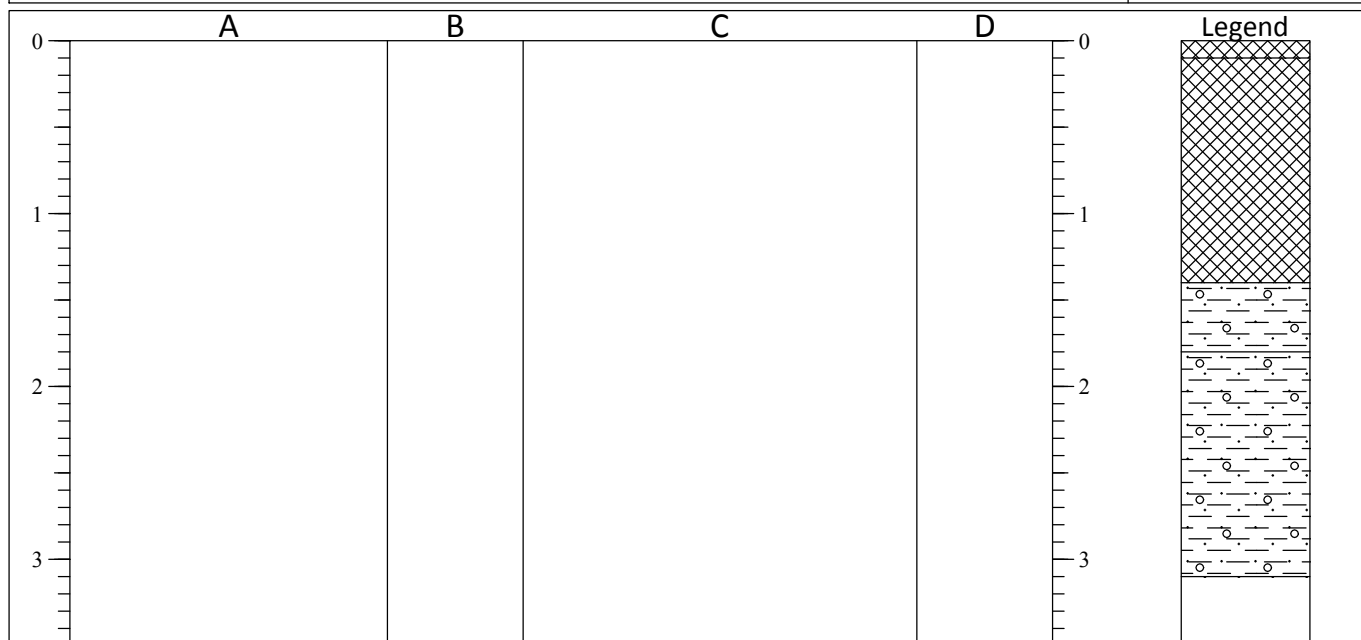
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.05		MADE GROUND: Dark brown slightly clayey slightly gravelly sandy TOPSOIL with roots and rootlets. Gravel is fine to coarse subangular to subrounded of sandstone mudstone coal and brick.			
0.05-0.40					
0.40-0.70		MADE GROUND: Black gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of coal burnt mudstone slag and ash.	0.30	E1	
0.70-1.40		MADE GROUND: Firm reddish brown sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone coal brick and slag.	0.60	E2	
		MADE GROUND: Firm dark brown sandy CLAY with roots rootlets pockets of peat and occasional glass.	0.90-1.00	B3	
		1.00 fast groundwater seepage			
1.40-1.80		Stiff reddish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal.	1.40	E4	
		1.50 Unmarked fireclay pipe encountered	1.50-1.60	B5	
1.80		END OF PIT (Unmarked Fireclay Pipe Encountered)			

Shoring/Support: Stability: Stable 			GENERAL REMARKS Strong solvent odour from unmarked fireclay pipe. Fast seepage at 1 m bgl.	
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All dimensions in metres Scale 1:25	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP7
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



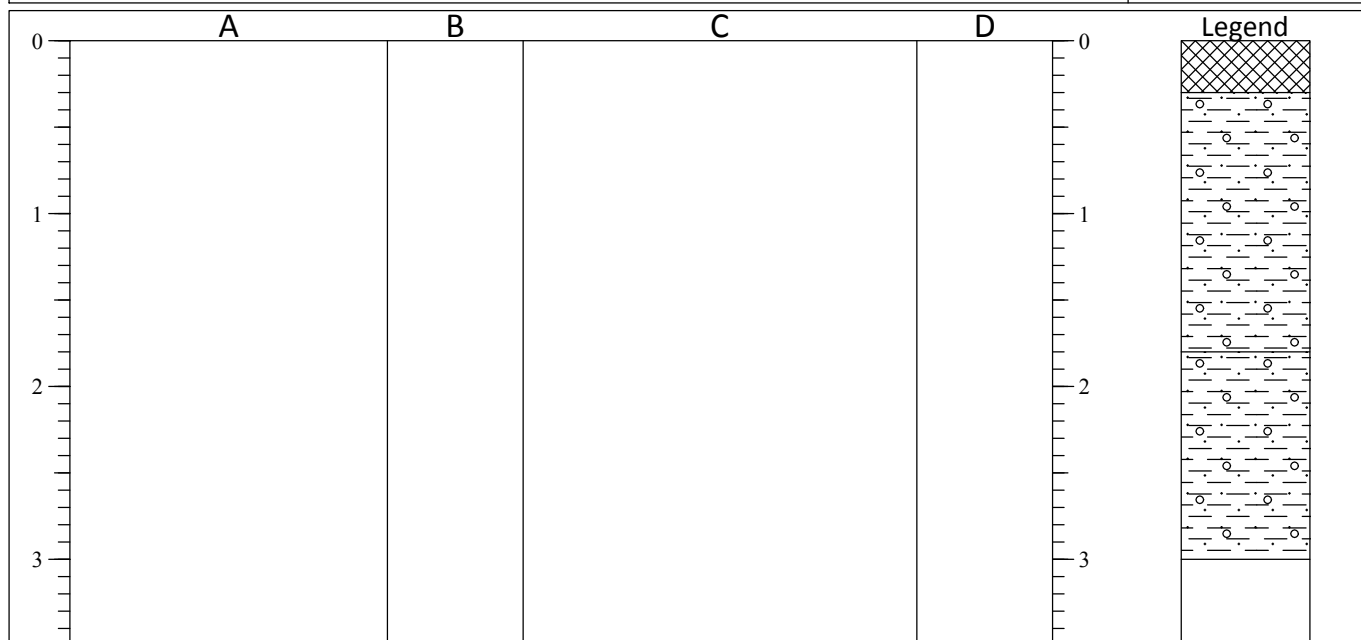
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Dark brown slightly clayey slightly gravelly sandy TOPSOIL with roots and rootlets. Gravel is fine to coarse subangular to subrounded of sandstone mudstone coal and brick. MADE GROUND: Black sandy fine to coarse angular GRAVEL of coal burnt mudstone and ash. 0.30 medium groundwater seepage			
0.10-1.40			0.40	E1	
1.40-1.80		Firm reddish brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal.	1.50	E2	
1.80-3.10		Stiff reddish brown occasionally mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal.	1.80-1.90	B3	
3.10		END OF PIT			

Shoring/Support: Stability: Unstable from 0.4 - 1.4 m bgl.		GENERAL REMARKS No olfactory signs of conamination. Medium groundwater seepage at 0.3 m bgl.
The diagram shows a rectangular pit. The top horizontal edge is labeled 'A' with a dimension line above it indicating a length of 2.2. The right vertical edge is labeled 'B' with a dimension line to its right indicating a width of 0.7. The bottom horizontal edge is labeled 'C' and the left vertical edge is labeled 'D'. To the right of the rectangle is a north arrow pointing upwards, labeled 'N'.		

All dimensions in metres Scale 1:43.75	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP8
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



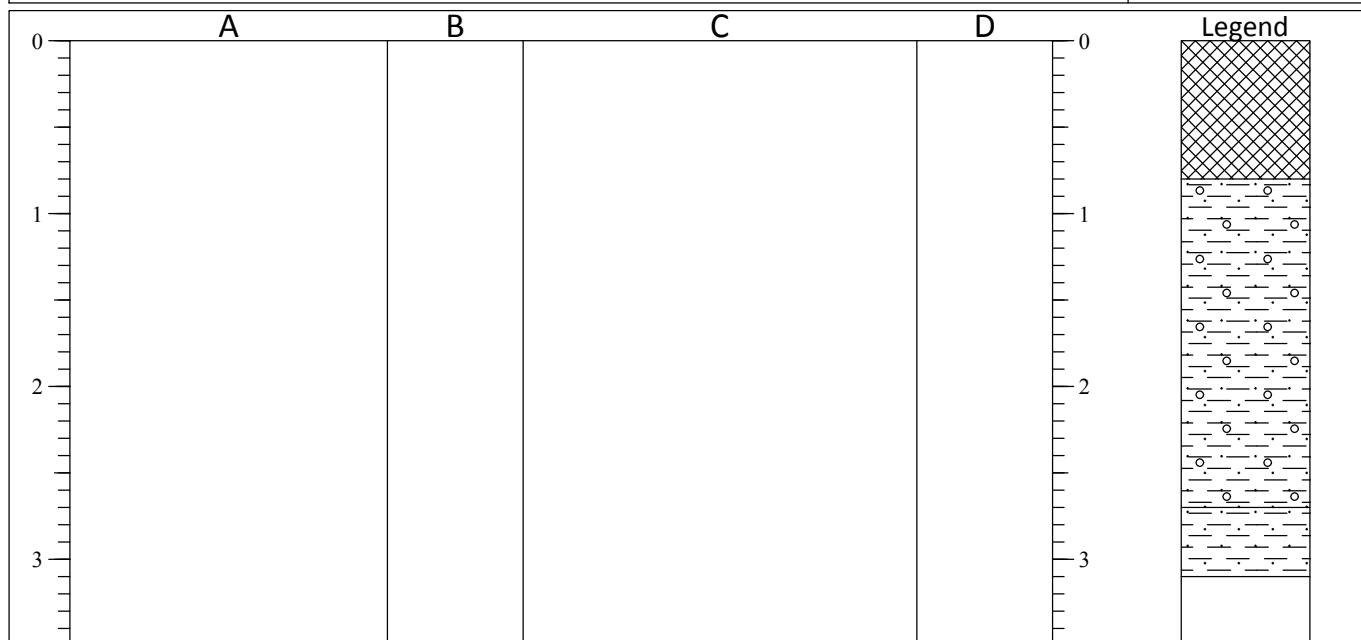
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Dark brown slightly clayey slightly gravelly sandy TOPSOIL with roots and rootlets. Gravel is fine to coarse subangular to subrounded of sandstone mudstone coal and brick. Firm brown sandy gravelly CLAY with pockets of peat and rootlets. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal.	0.10	E1	
0.30-1.80			0.50-0.70	B2	
1.80-3.00		Firm reddish brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal. 2.40 - 3.00 becomes stiff	2.40-2.50	B3	
3.00		END OF PIT			

Shoring/Support: Stability: Stable 			GENERAL REMARKS	
			No visual or olfactory signs of contamination. No groundwaer encountered during excavation.	

All dimensions in metres Scale 1:43.75	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP9
Job No 8190	Date 22-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		MADE GROUND: Greyish brown sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone coal slag concrete ash brick and metal with roots and rootlets. 0.50 slow groundwater seepage	0.50	E1	
0.80-2.70		Firm reddish brown mottled grey sandy gravelly CLAY with pockets of peat. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal. 1.40 peat no longer present 1.80 - 2.70 becomes stiff	0.80	E2	
			1.50-1.60	B3	
2.70-3.10		Very stiff brown slightly sandy CLAY.			
3.10		END OF PIT			

Shoring/Support: Stability: Stable 				GENERAL REMARKS	
				Faint hydrocarbon odour from 0.4 o 0.6 m bgl. Slow groundwater seepage at 0.5 m bgl.	

All dimensions in metres Scale 1:43.75	Client Gleeson Homes Cumbria	Method/ Plant Used	JCB 3CX	Logged By	NT
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BOREHOLE LOG

Project Water's Edge, Whitehaven				BOREHOLE No WS1	
Job No 8190	Date 23-08-19	Ground Level (m)	Co-Ordinates ()		
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1	

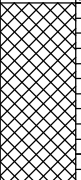
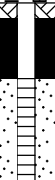
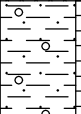
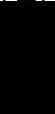
SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.60) 0.60	MADE GROUND: Soft brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse subangular to subrounded of sandstone mudstone limestone brick and concrete.		
1.20-1.65	SPT	N12					Firm brown occasionally mottled grey sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and coal.		
2.00-2.45	SPT	N21					1.20 - 3.00 becomes stiff		
3.00-3.45	SPT	N27				(3.85)	3.00 - 4.45 becomes very stiff		
4.00-4.45	SPT	N40				4.45			
							END OF BOREHOLE (Refusal - Barrel Bouncing on Very Stiff Clay)		

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 bgl. No visual or olfactory signs of contamination. No groundwater encountered during drilling.
All dimensions in metres Scale 1:50			Client Gleeson Homes Cumbria			Method/ Plant Used			DART		Logged By NT

AGS3 UK BH NEW 8190 BH LOGS 1ST DRAFT.GPJ AGS3 ALL GDT 12/9/19

BOREHOLE LOG

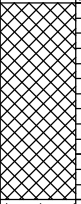
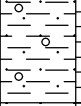
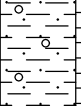
Project Water's Edge, Whitehaven				BOREHOLE No WS2	
Job No 8190	Date 23-08-19	Ground Level (m)	Co-Ordinates ()		
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10	E					(1.20)	MADE GROUND: Greyish brown slightly clayey sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone brick and concrete.		
1.20-1.65	SPT	N13				1.20 (0.80)	Stiff reddish brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal.		
2.00-2.00	SPT	N50/0				2.00	END OF BORHOLE (Obstruction - Presumed Sandstone Cobble)		

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 bgl. No visual or olfactory signs of contamination. Fast groundwater seepage at 0.4 m bgl.
All dimensions in metres Scale 1:50			Client Gleeson Homes Cumbria			Method/ Plant Used			DART		Logged By NT

BOREHOLE LOG

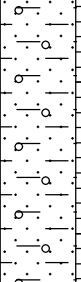
Project Water's Edge, Whitehaven				BOREHOLE No WS3	
Job No 8190	Date 23-08-19	Ground Level (m)	Co-Ordinates ()		
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.60	E					(1.30)	MADE GROUND: Soft greyish brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone brick concrete and slag.		
1.20-1.65	SPT	N14				1.30 (0.70)	Stiff reddish brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and coal.		
2.00-2.45	SPT	N28				2.00 (0.95)	Very stiff brown occasionally mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and coal.		
2.50-2.95	SPT	N50				2.95	END OF BOREHOLE (Refusal - Barrel Bouncing on Very Stiff Clay)		

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 bgl. No visual or olfactory signs of contamination. No groundwater encountered during drilling.
All dimensions in metres Scale 1:50			Client Gleeson Homes Cumbria			Method/ Plant Used			DART		Logged By NT

BOREHOLE LOG

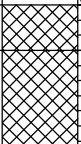
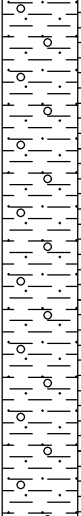
Project Water's Edge, Whitehaven				BOREHOLE No WS4	
Job No 8190	Date 23-08-19	Ground Level (m)	Co-Ordinates ()		
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.45) 0.45	MADE GROUND: Dark grey sandy fine to coarse angular to subrounded GRAVEL of sandstone mudstone brick slag and concrete. 0.30 Subrounded cobble of concrete 0.40 Subangular cobble of slag		
1.20-1.65	SPT	N17				(1.90)	Destructured sandstone bedrock recovered as - Medium dense reddish brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of sandstone.		
2.00-2.35	SPT	N50				2.35			
							END OF BOREHOLE (Obstruction - Presumed Competent Sandstone Bedrock)		

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 bgl. No visual or olfactory signs of contamination. Slow seepage at 0.3 m bgl.
All dimensions in metres Scale 1:50			Client Gleeson Homes Cumbria			Method/ Plant Used			DART		Logged By NT

BOREHOLE LOG

Project Water's Edge, Whitehaven				BOREHOLE No WS5
Job No 8190	Date 23-08-19	Ground Level (m)	Co-Ordinates ()	
Contractor Dunelm Geotechnical & Environmental Ltd				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.40	E					0.30	MADE GROUND: Brown clayey sandy TOPSOIL with roots and rootlets.	
						(0.70) 1.00	MADE GROUND: Black sandy fine to coarse angular GRAVEL of coal ash and occasional mudstone.	
1.20-1.65	SPT	N8			(3.45)	4.45	Firm brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone and coal. 1.50 - 2.00 becomes stiff 2.00 - 4.45 becomes very stiff	
2.00-2.45	SPT	N27						
3.00-3.45	SPT	N29						
4.00-4.45	SPT	N32						
							END OF BOREHOLE (Refusal - Barrel Bouncing on Very Stiff Clay)	

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 bgl. Hydrocarbon odour from 0.3 to 1 m bgl. Slow seepage at 0.3 m bgl.
All dimensions in metres Scale 1:50			Client Gleeson Homes Cumbria			Method/ Plant Used			DART		Logged By NT

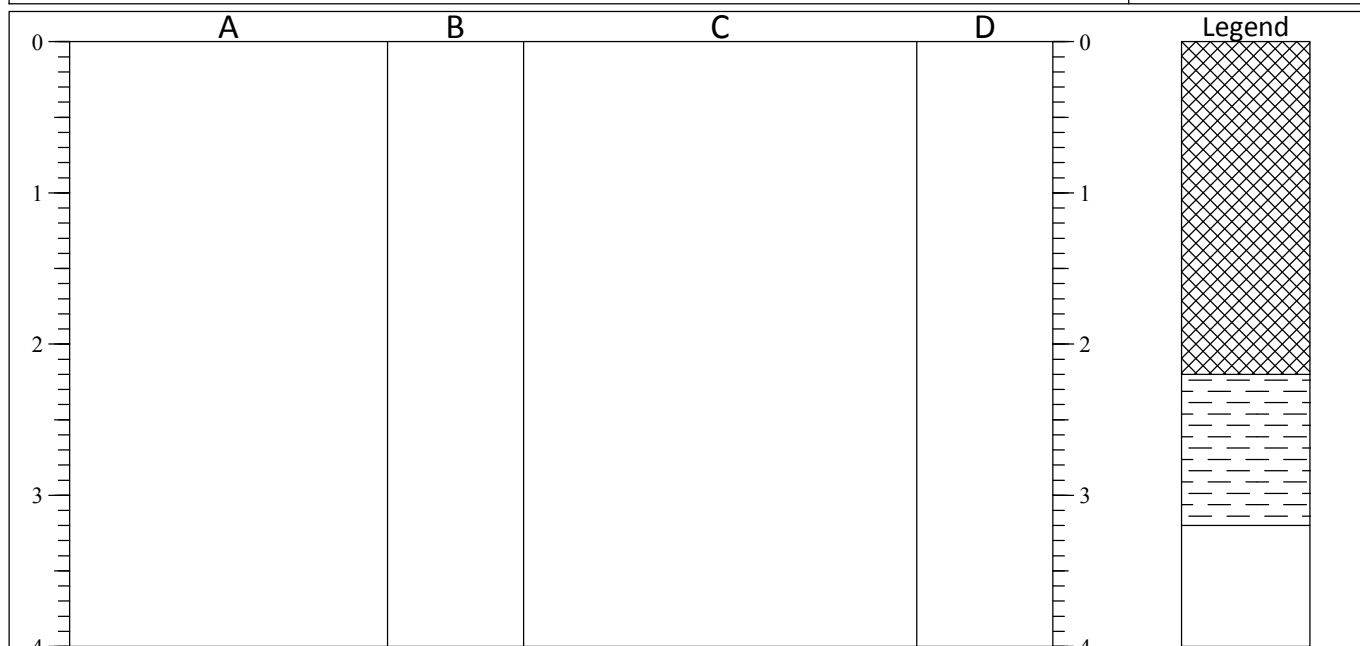
AGS3 UK BH NEW 8190 BH LOGS 1ST DRAFT.GPJ AGS3 - ALL GDT 12/9/19

APPENDIX 2.2

FWS 2020

TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP101
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



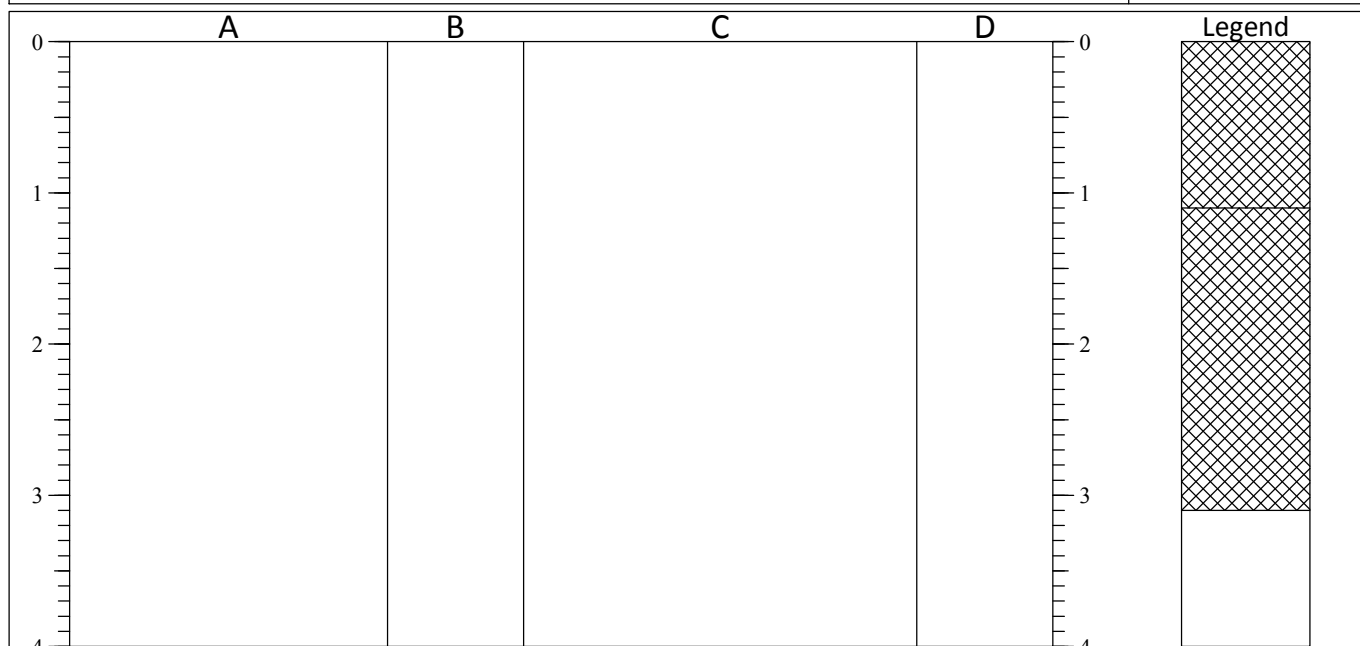
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-2.20		MADE GROUND: Firm blackish brown slightly sandy slightly gravelly CLAY with low cobble and boulder content. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick plastic concrete metal and ceramic. Boulders are angular to subangular of concrete.	0.40	E1	
			1.00-1.10	D2	
2.20-3.20		Firm grey brown mottled black and orange slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 2.60 Becomes stiff.	2.30	E3	
			2.50-2.60	D4	
3.20		END OF PIT			

Shoring/Support: None Stability: Stable	GENERAL REMARKS No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used 8 ton tracked excavator.	Logged By FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP102
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



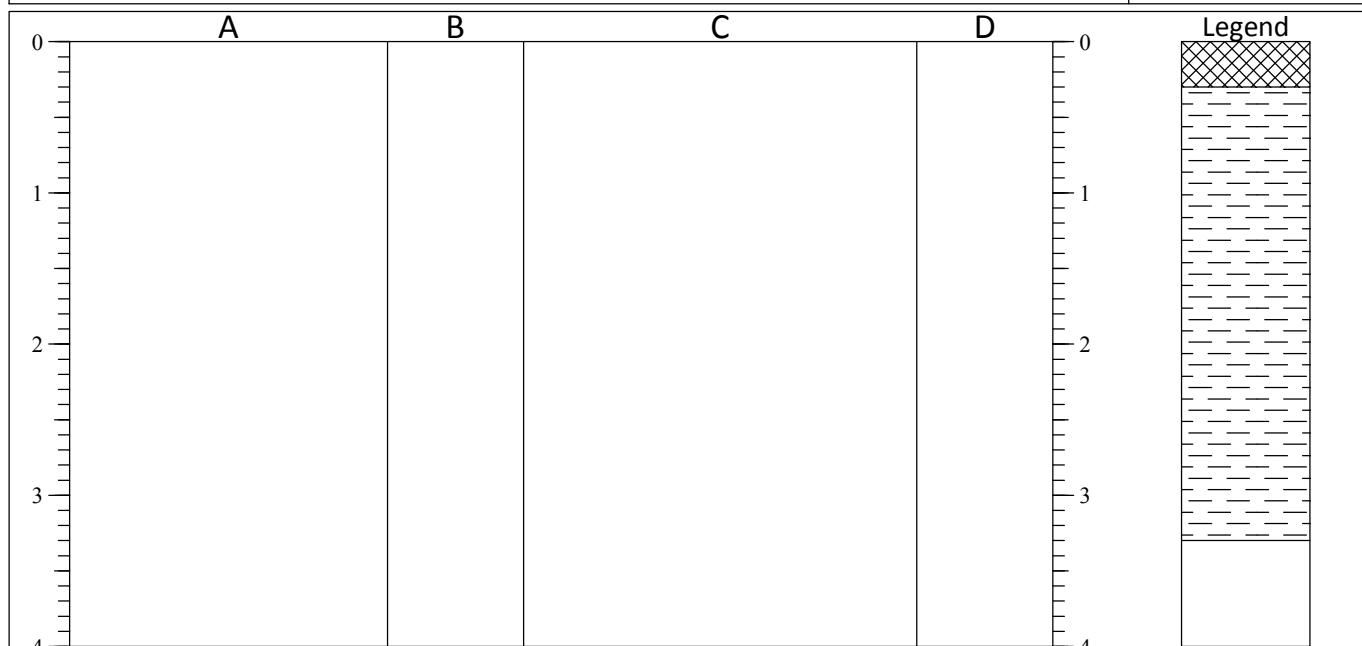
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.10		MADE GROUND: Blackish brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete and glass.	0.30 0.50-0.60	E1 B2	
1.10-3.10		MADE GROUND: Firm blackish brown slightly sandy slightly gravelly CLAY with low cobble and boulder content. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick plastic concrete metal and ceramic. Boulders are angular to subangular of concrete.	1.20 1.50-1.60	E3 D4	
3.10		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP103
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



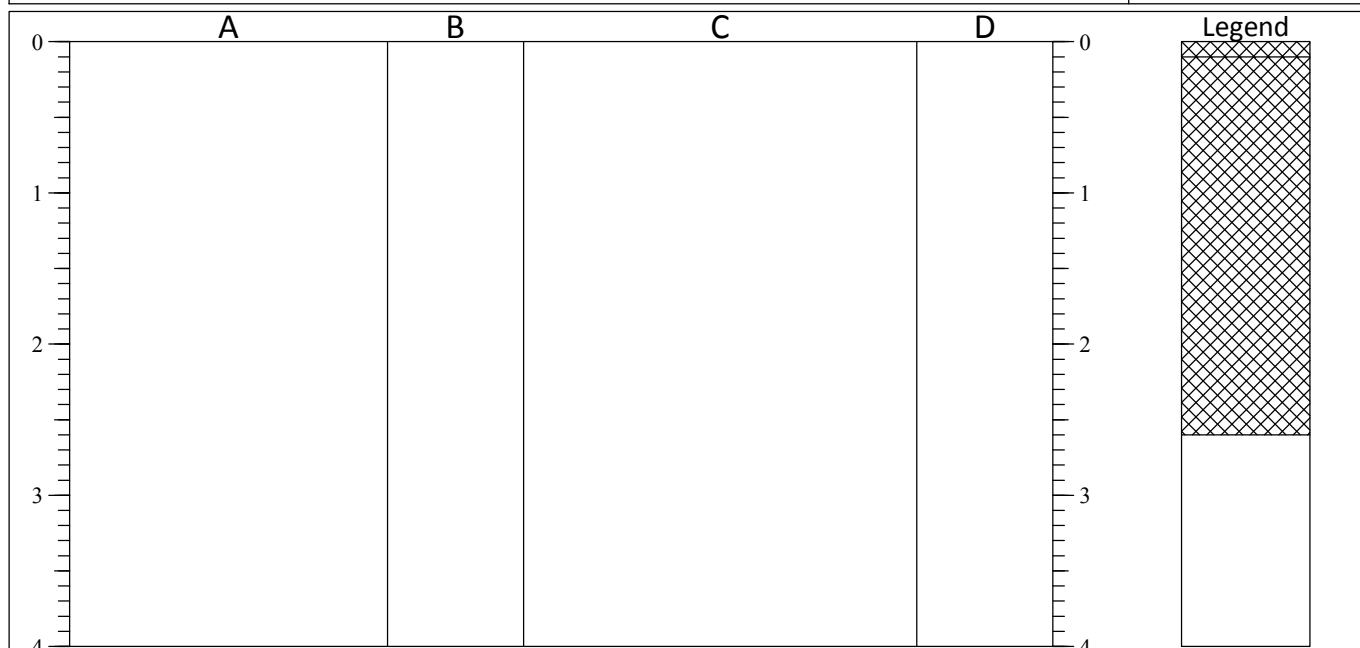
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Firm brownish grey mottled white slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone brick concrete and slag.	0.10	E1	
0.30-3.30		Firm grey brown mottled black and orange slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	0.20-0.30	D2	
			0.50	E3	
			1.40 Becomes stiff.		
		2.50 Becomes very stiff.	1.90-2.00	D4	
3.30		END OF PIT			

Shoring/Support: None Stability: Stable 				GENERAL REMARKS	
				No Visual or olfactory signs of contamination.	

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP104
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



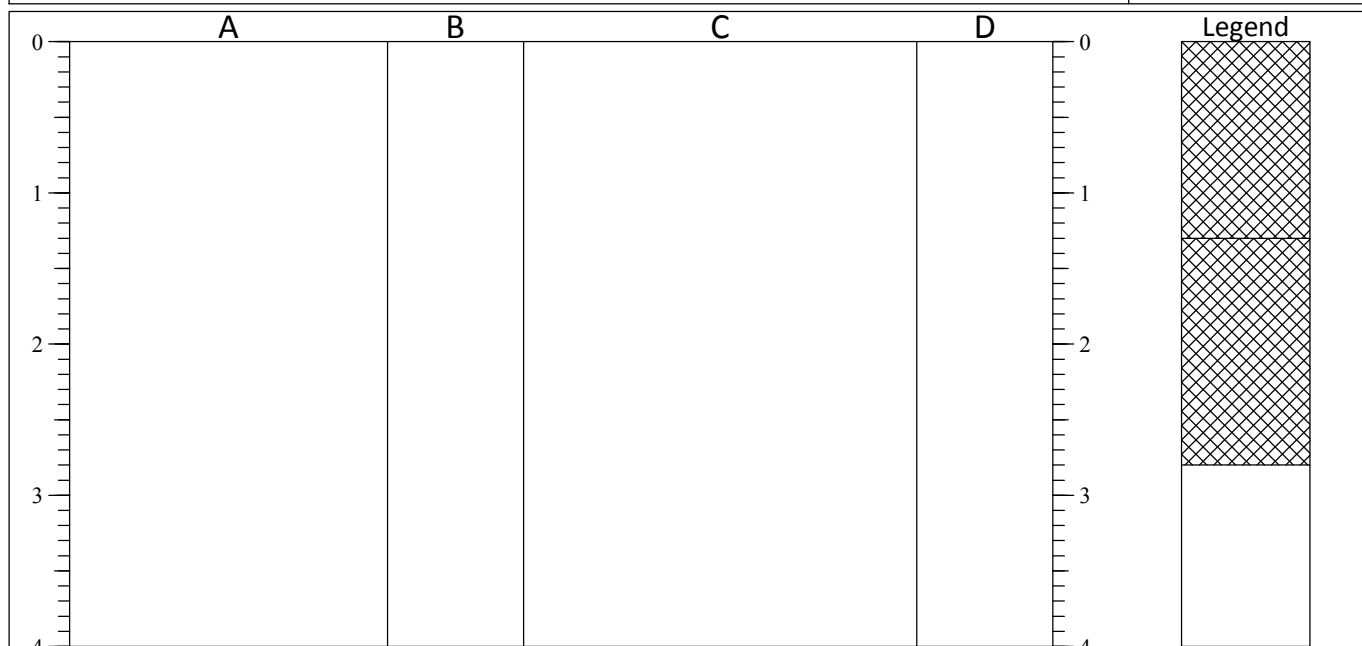
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Brown slightly clayey slightly gravelly sandy TOPSOIL with rootlets. Gravel is fine to medium angular to subrounded of sandstone mudstone coal brick and glass. MADE GROUND: Firm brownish grey mottled white slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone brick concrete and slag. 1.40 Becomes stiff.	0.10	E1	
0.10-2.60			0.60	E2	
			2.00-2.10	D3	
2.60		END OF PIT CONCRETE SLAB	2.60	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP105
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



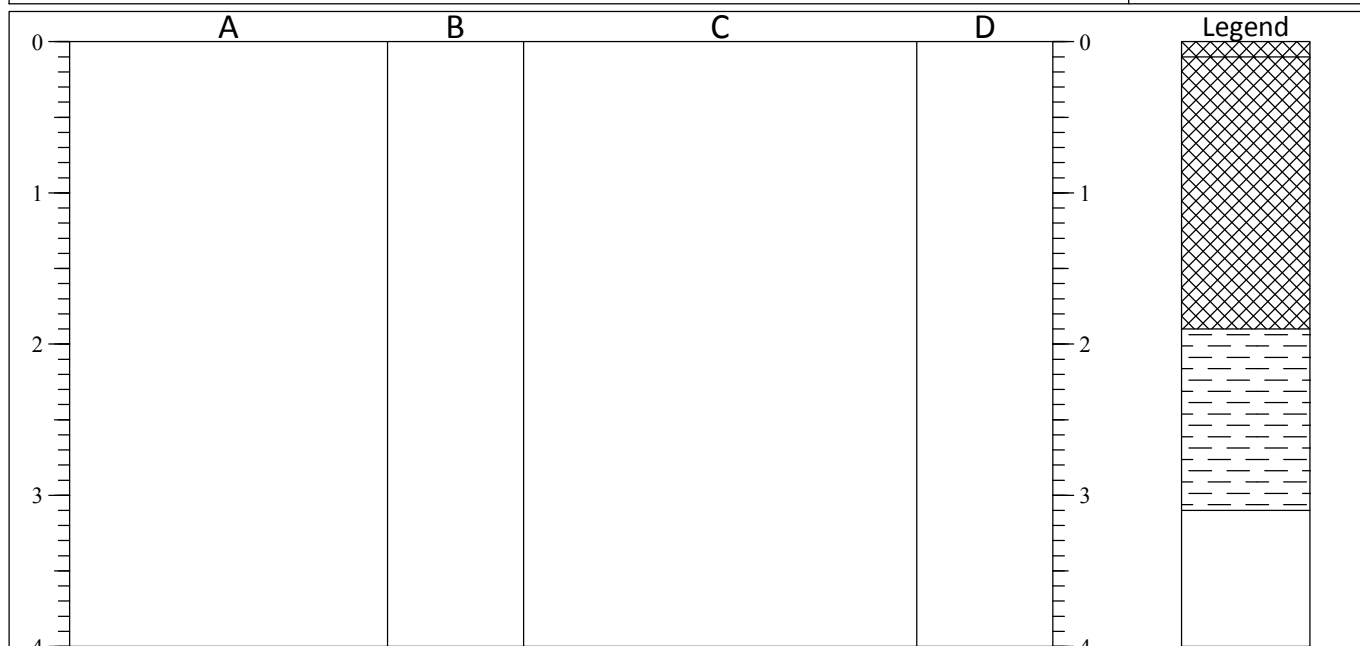
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.30		MADE GROUND: blackish brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of mudstone sandstone coal brick concrete and slag.	0.70	E1	
			1.00-1.10	B2	
1.30-2.80		MADE GROUND: Firm brownish grey mottled white slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone brick concrete and slag.	1.40	E3	
			2.50-2.60	D4	
2.80		END OF PIT: CONCRETE SLAB			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP106
Job No 8190	Date 20-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



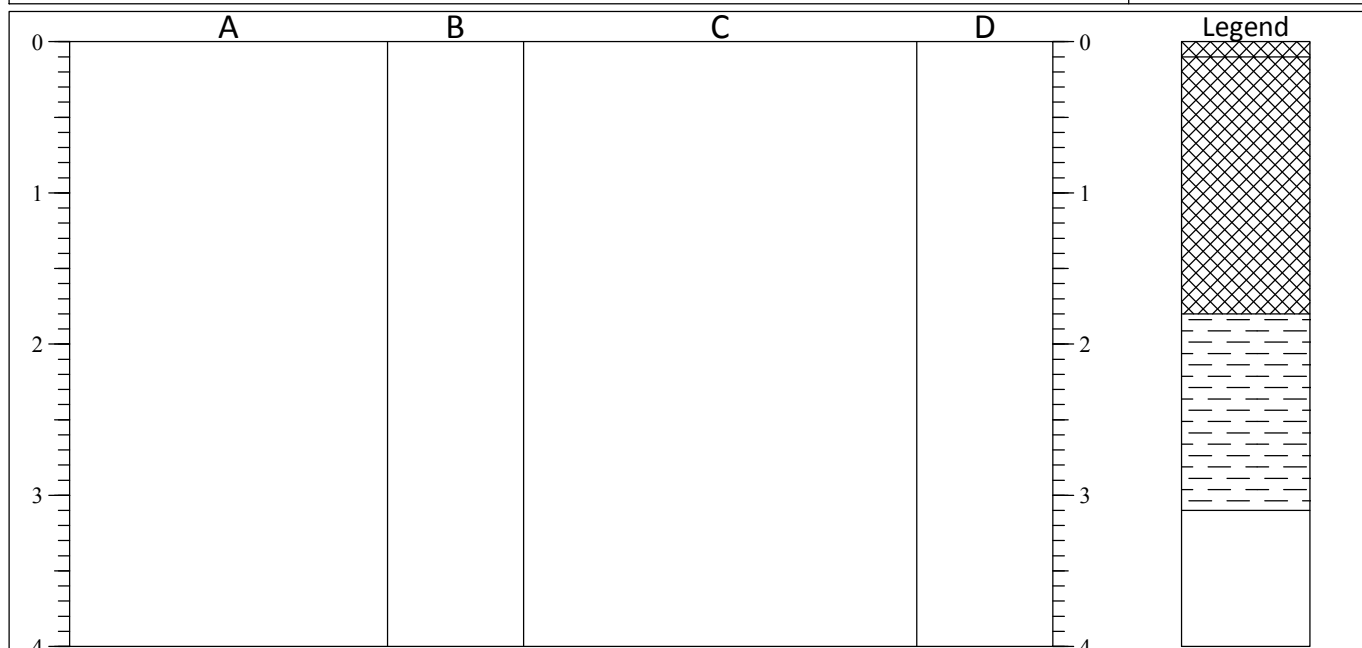
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Brown slightly clayey slightly gravelly sandy TOPSOIL with rootlets. Gravel is fine to medium angular to subrounded of sandstone mudstone coal brick and glass. MADE GROUND: Firm grey brown slightly gravelly sandy CLAY with low cobble content. Gravel is fine to coarse angular to rounded of sandstone brick and concrete. Cobbles are angular to subangular of brick and concrete. 0.30 - 0.60 Stained black with strong solvent odour.	0.40	E1	
0.10-1.90			1.50	D2	
1.90-3.10		Firm grey brown mottled orange slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 2.30 Becomes stiff.	2.00	E3	
3.10		END OF PIT	2.90	B4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP107
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



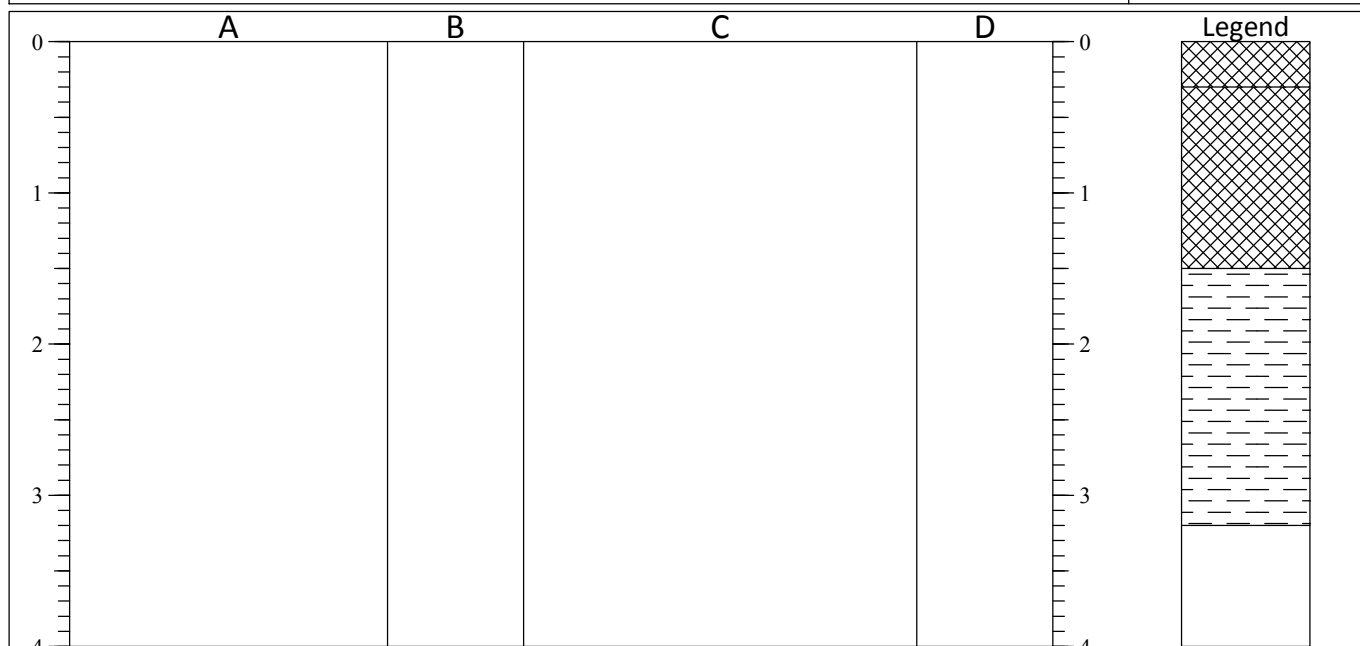
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Blackish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is angular to rounded of sandstone mudstone coal brick and concrete. Cobbles are angular to subrounded of sandstone brick and concrete. MADE GROUND: Blackish grey sandy fine to coarse GRAVEL of sandstone mudstone slag brick and coal.	0.20	E1	
0.10-1.80			0.90-1.00	B2	
1.80-3.10		Firm grey brown mottled orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 2.10 Becomes stiff.	2.00-2.10	D3	
3.10		END OF PIT.	3.00-3.10	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP108
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



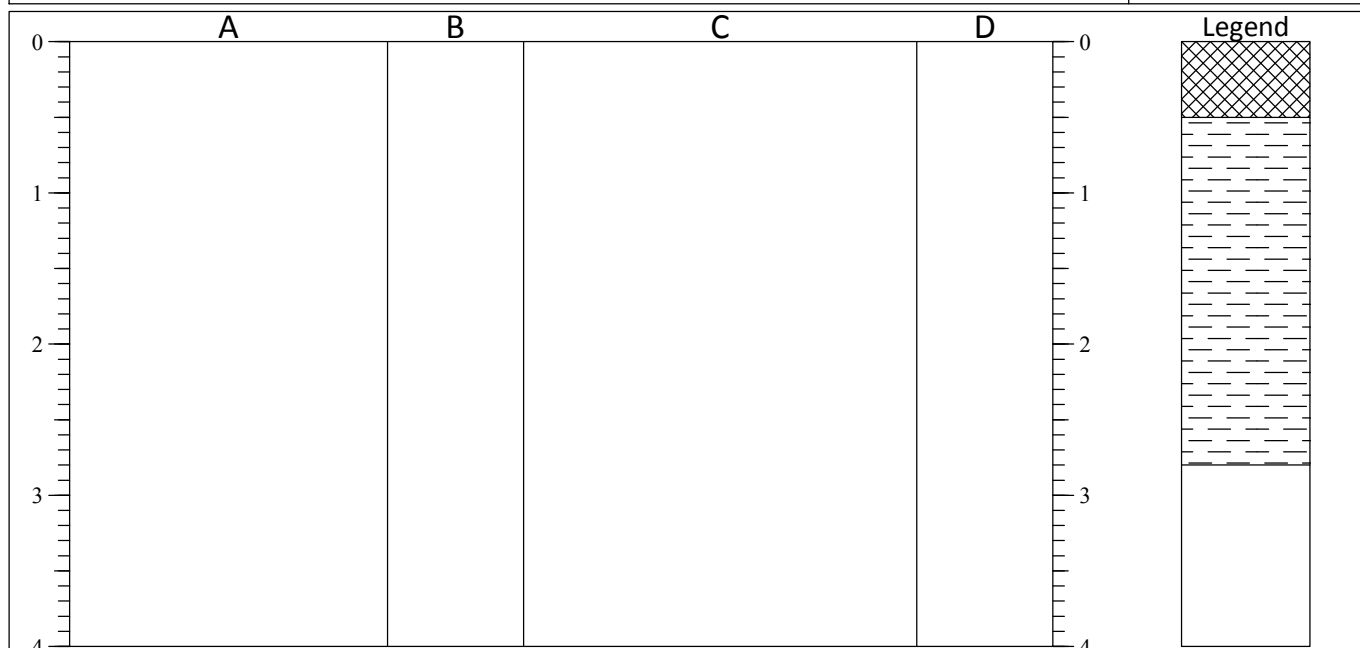
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Grey brown gravelly very sandy CLAY. Gravel is fine to coarse of sandstone mudstone brick concrete and glass.	0.20	E1	
0.30-1.50		MADE GROUND: Brownish black slightly sandy slightly gravelly CLAY with organic matter. Gravel is fine to coarse angular to subrounded of sandstone coal and occasional metal and brick.	0.60	E2	
			0.70-0.80	D3	
1.50-3.20		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.90 Becomes stiff 2.70 Becomes very stiff	1.60	E4	
			2.00-2.10	D5	
3.20		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP109
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



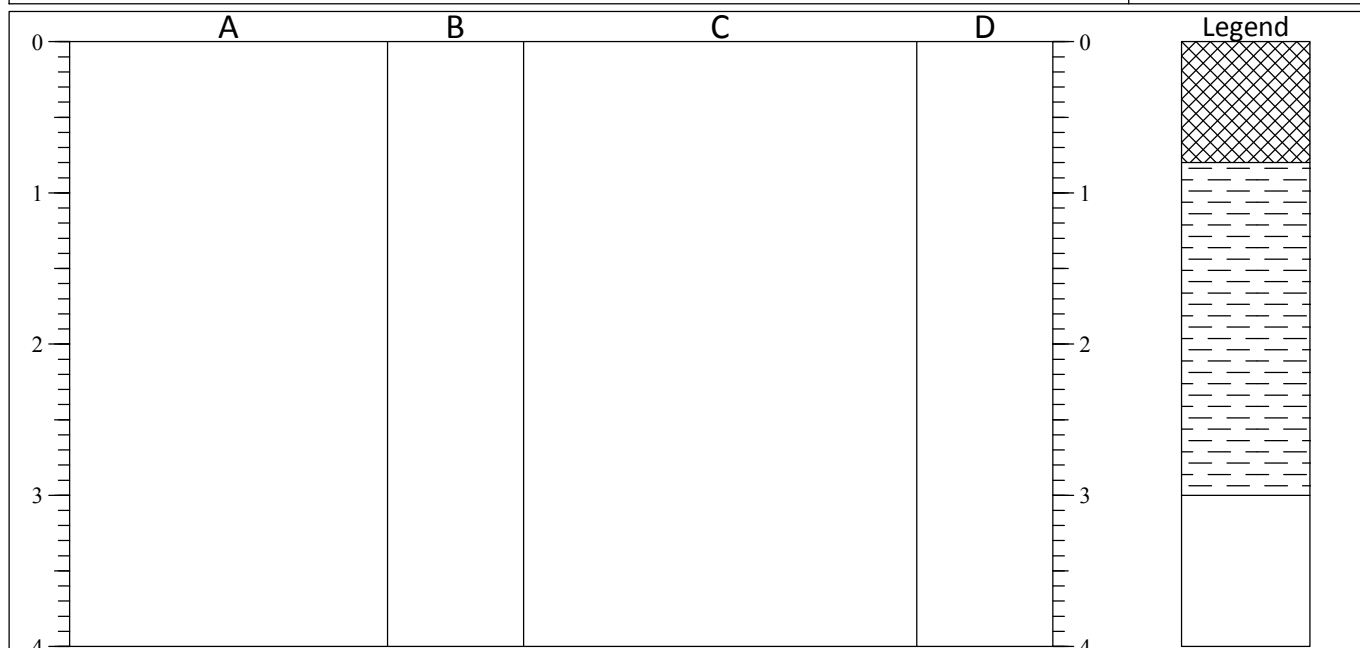
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Firm black mottled orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone brick concrete ceramic plastic and glass.	0.20	E1	
0.50-2.80		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	0.30-0.40	D2	
		1.60 Becomes stiff	0.90-1.00	D3	
			1.90-2.00	D4	
2.80		END OF PIT			

Shoring/Support: None Stability: Stable	GENERAL REMARKS
	No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used 8 ton tracked excavator.	Logged By FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP110
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



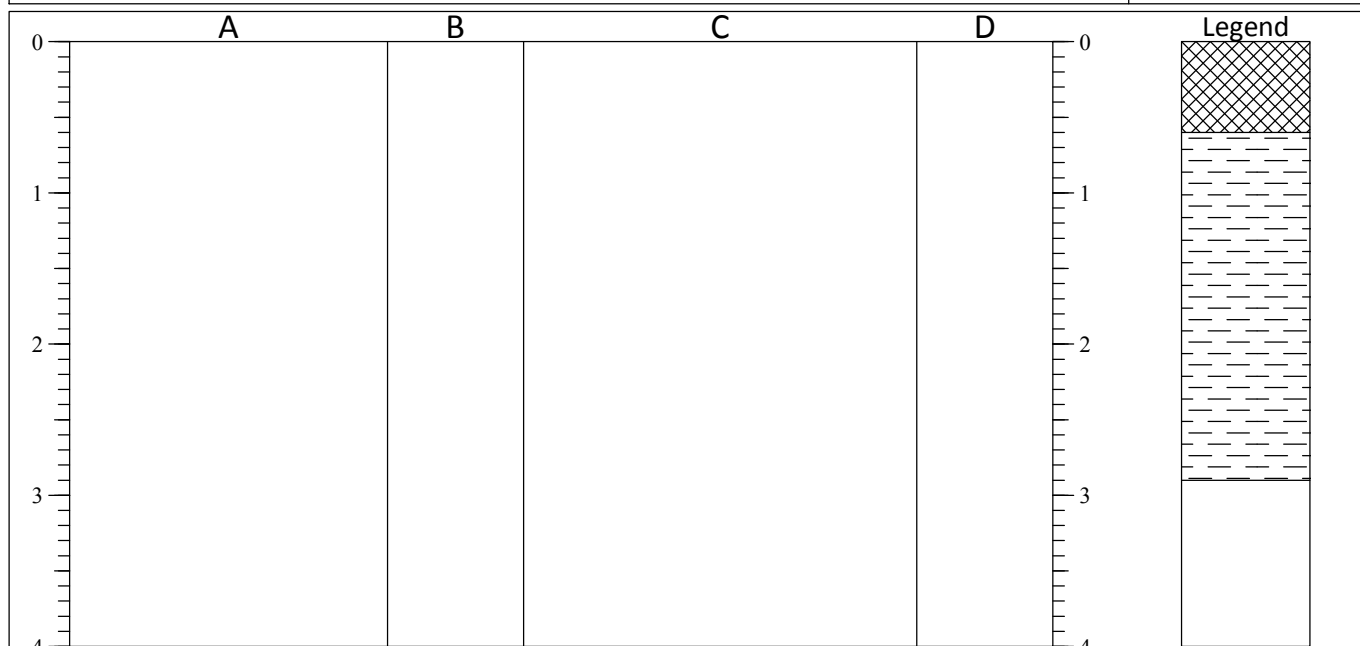
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		MADE GROUND: Grey brown very sandy very gravelly CLAY with low cobble content. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete metal and ceramic. Cobbles are angular to subangular of brick and concrete.	0.50	E1	
0.80-3.00		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.40 Becomes stiff. 2.60 Becomes very stiff.	0.90-1.00	D2	
			1.90-2.00	D3	
3.00		END OF PIT	2.90-3.00	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP111
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



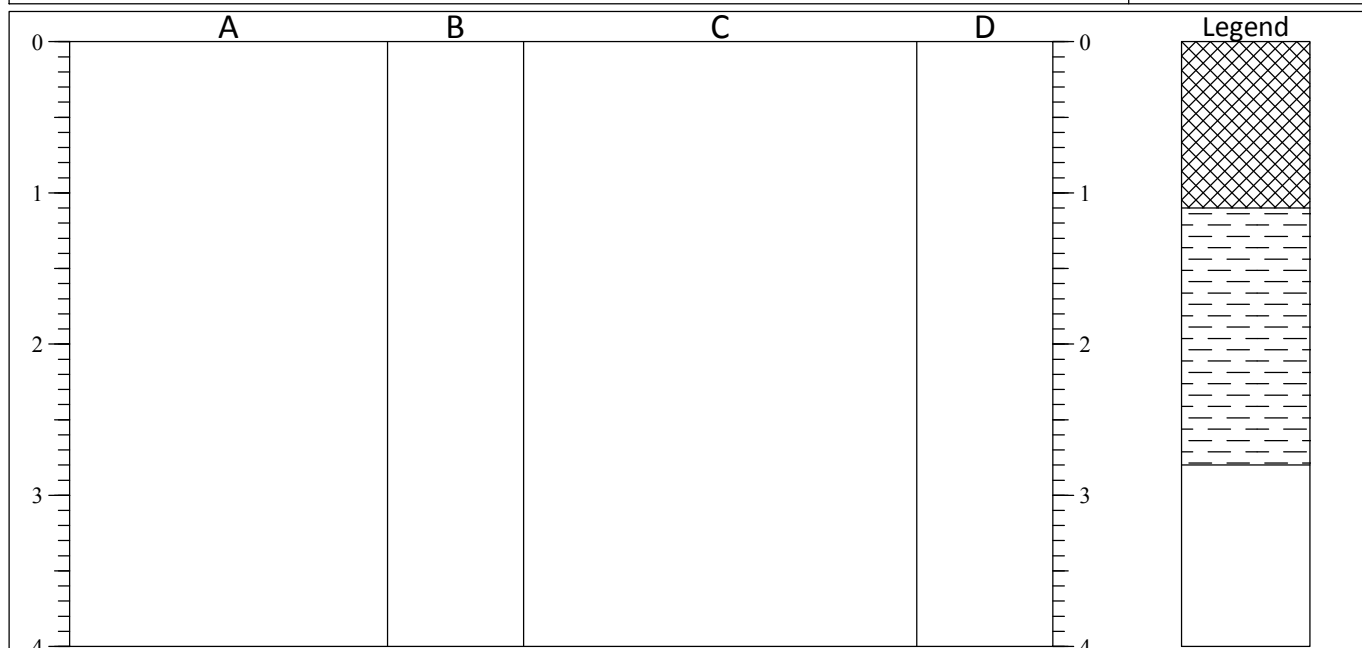
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		MADE GROUND: Blackish brown mottled white and grey slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone brick slag and concrete.	0.30	E1	
0.60-2.90		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	0.70	E2	
		1.50 Becomes stiff.	1.00-1.10	D3	
			2.00-2.10	D4	
2.90		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP112
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



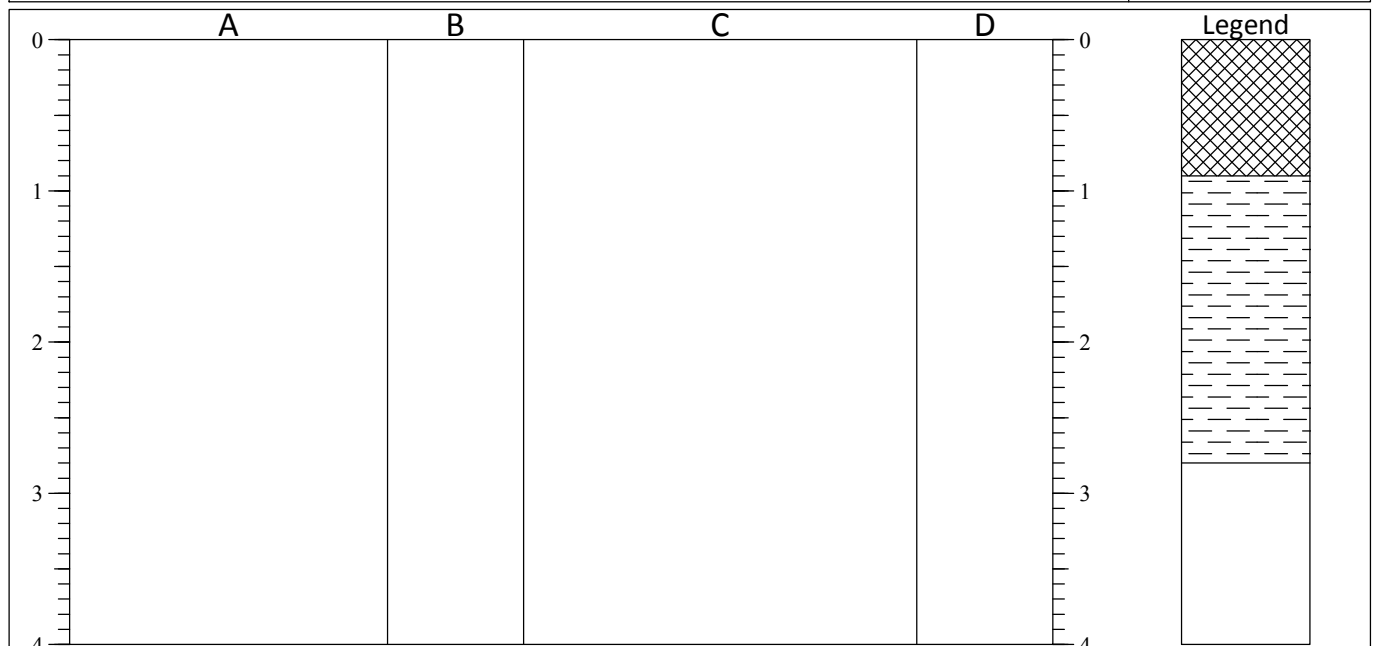
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.10		MADE GROUND: Blackish grey slightly clayey gravelly fine to coarse SAND. Gravel is angular to rounded of sandstone mudstone brick concrete and metal.	0.30 0.40-0.50	E1 B2	
1.10-2.80		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.80 Becomes stiff.	1.50-1.60	D3	
2.80		END OF PIT.	2.50-2.60	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP113
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



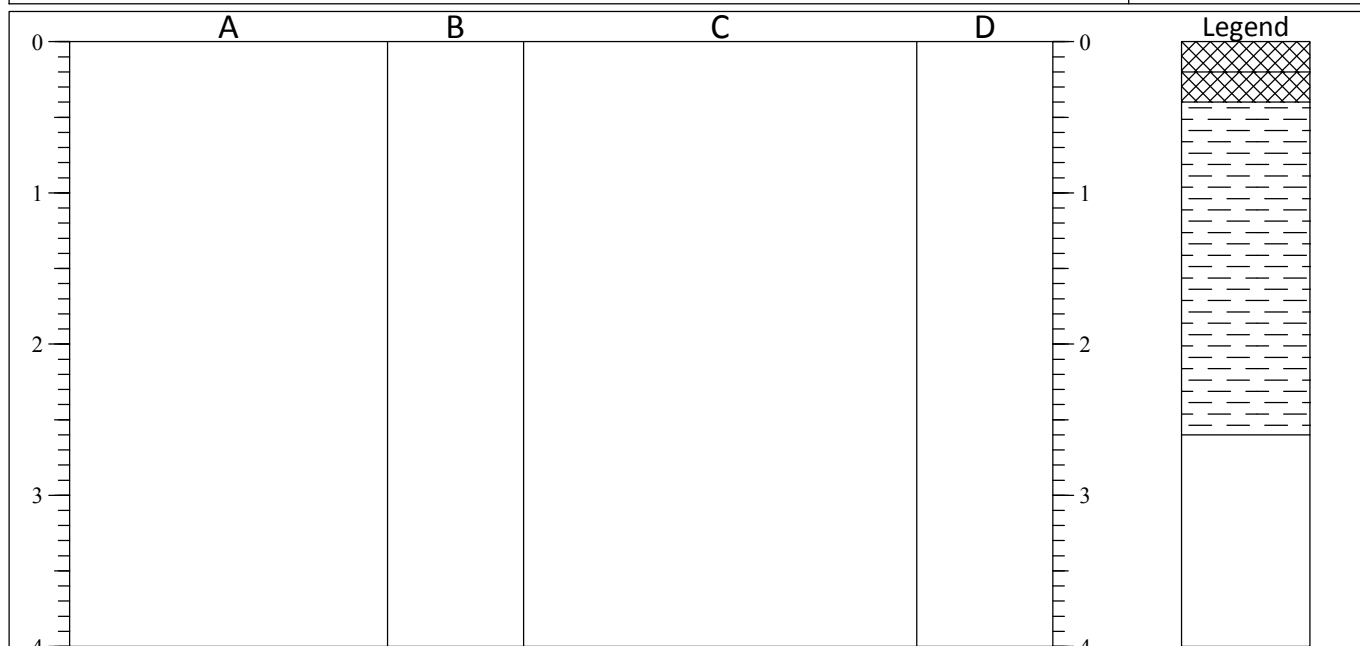
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.90		MADE GROUND: Firm blackish brown slightly gravelly sandy CLAY with low cobble content. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete and ceramic. Cobbles are angular to subangular of brick and concrete.	0.30	E1	
0.90-2.80		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.70 Becomes stiff. 2.40 Becomes very stiff.	1.00 1.10	E2 D3	
2.80		END OF PIT	2.00	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP114
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



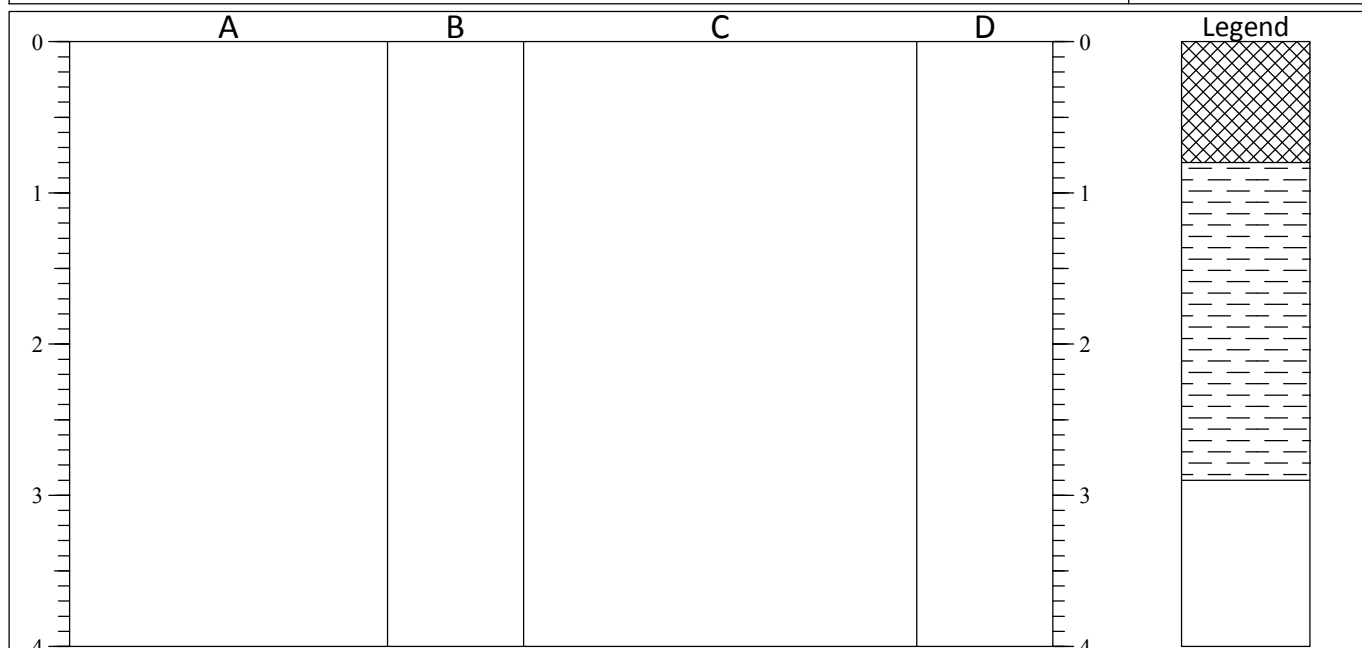
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Grey brown slightly clayey slightly gravelly sandy TOPSOIL with rootlets. Gravel is fine to medium angular to subrounded of sandstone mudstone coal brick and glass. MADE GROUND: Firm brownish grey mottled black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone limestone coal brick plastic concrete and glass. Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.20 Becomes stiff. 2.50 Becomes very stiff. END OF PIT	0.10	E1	
0.20-0.40			1.00-1.10	D2	
0.40-2.60			2.00-2.10	D3	

Shoring/Support: None Stability: Stable			GENERAL REMARKS No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP115
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



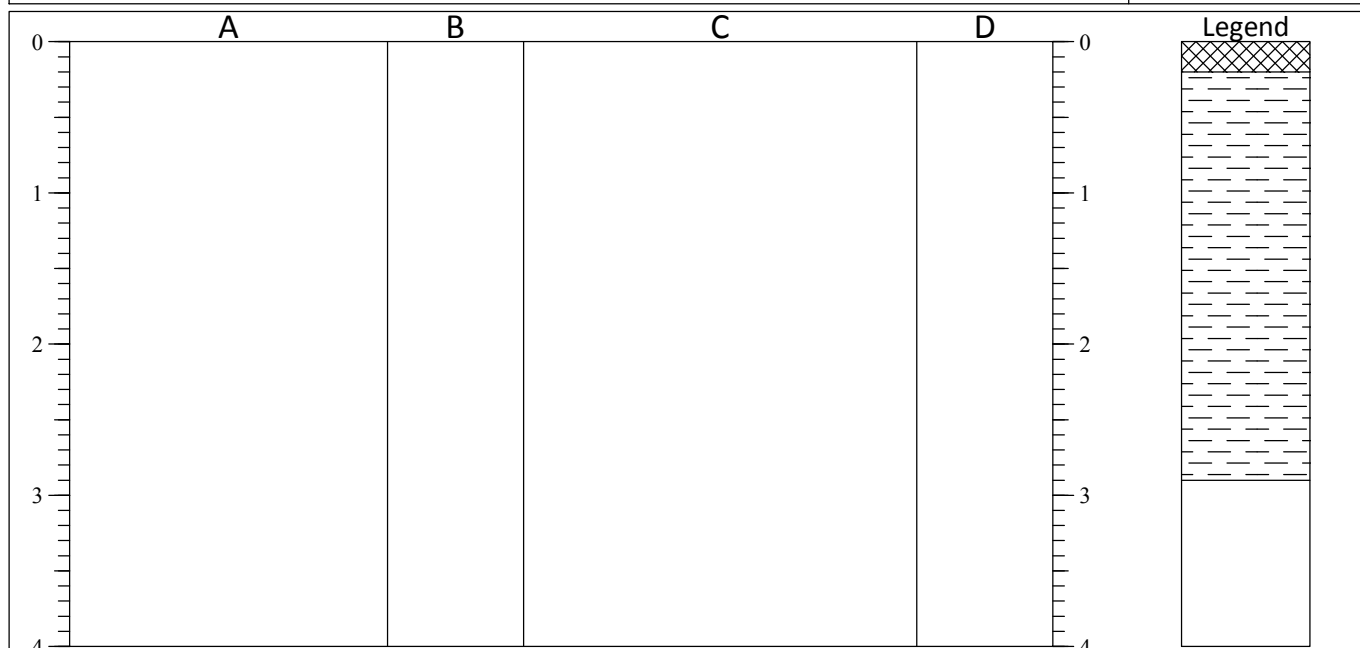
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		MADE GROUND: Grey brown sandy fine to coarse angular to subangular GRAVEL of sandstone basalt mudstone brick concrete and metal.	0.40	E1	
0.80-2.90		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.40 Becomes stiff. 2.30 Becomes very stiff.	0.90-1.00	D2	
			1.90-2.00	D3	
2.90		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP116
Job No 8190	Date 21-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



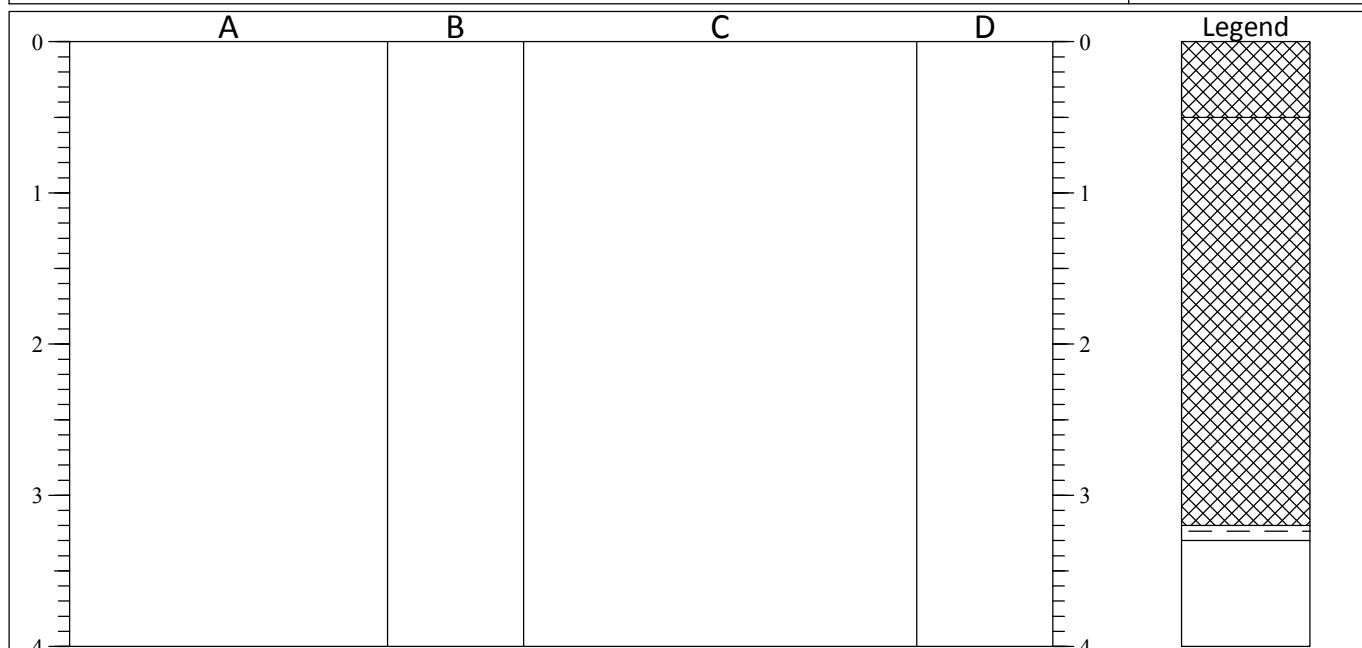
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		MADE GROUND: Grey brown slightly clayey slightly gravelly sandy TOPSOIL with rootlets. Gravel is fine to medium angular to subrounded of sandstone mudstone coal brick and glass. Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.60 Becomes stiff 2.70 Becomes very stiff END OF PIT	0.40	E1	
0.20-2.90			0.50-0.60	D2	
			1.50-1.60	D3	
			2.50-2.60	D4	
2.90					

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP117
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



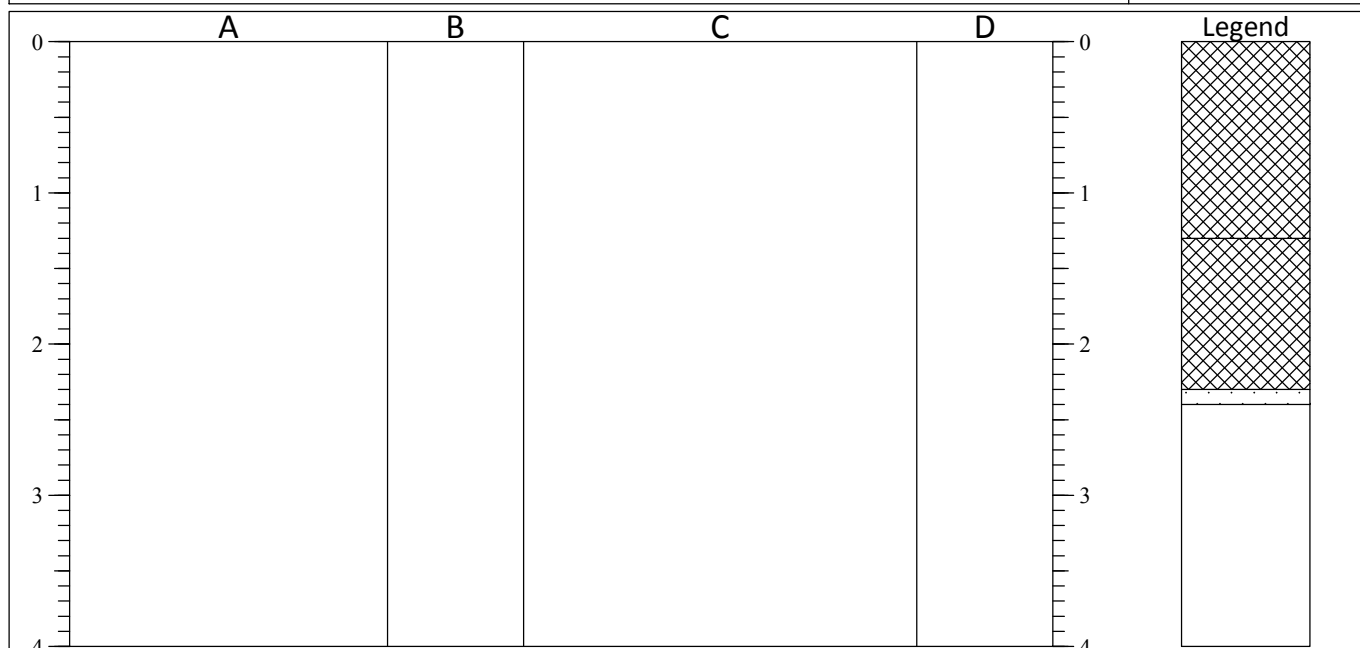
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Blackish grey sandy fine to coarse angular to rounded GRAVEL of sandstone mudstone brick and ceramic with medium cobble content. Cobbles are angular to subangular of brick.	0.30	E1	
0.50-3.20		MADE GROUND: Firm blackish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone metal brick concrete plastic and rubber.	0.60	E2	
			1.00-1.10	D3	
3.20-3.30		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	3.20-3.30	D4	
3.30		END OF PIT.			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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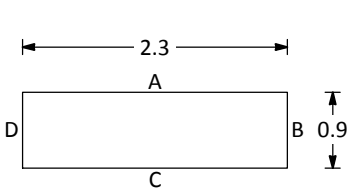
All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP118
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



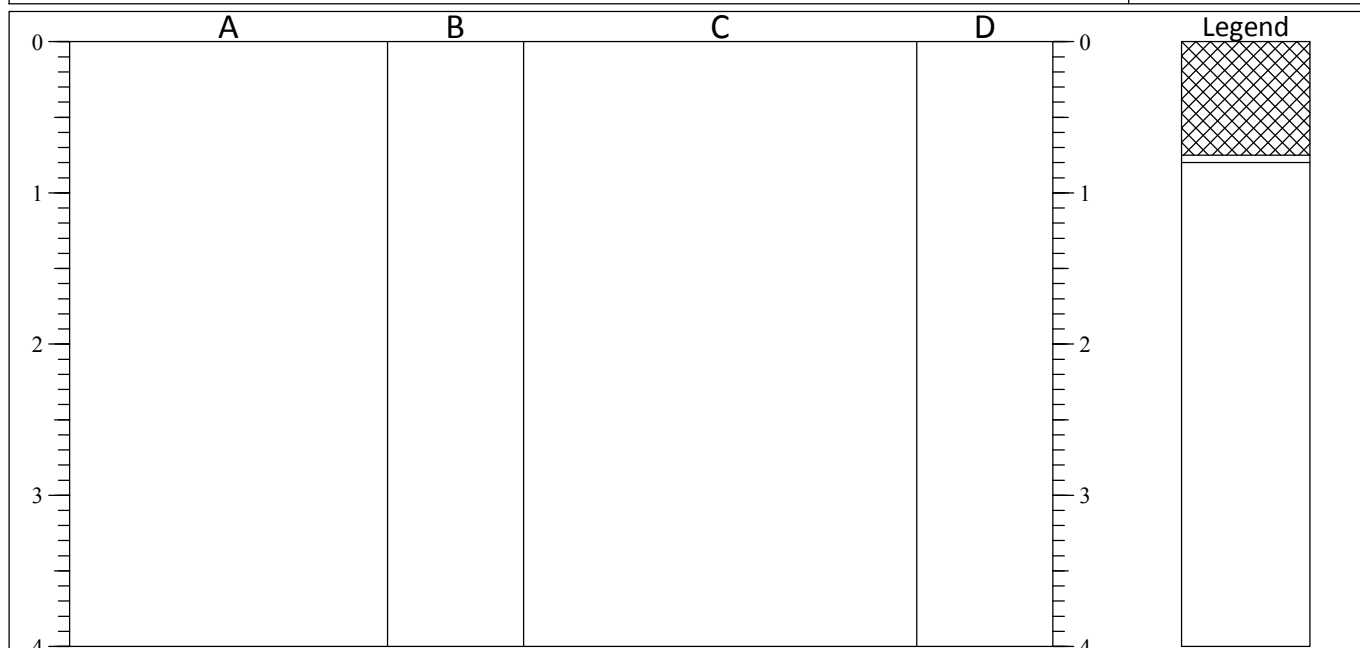
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.30		MADE GROUND: Grey mottled white very sandy fine to coarse angular to subrounded GRAVEL of coal brick and concrete with ash.	0.30	E1	
1.30-2.30		MADE GROUND: Grey brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone mudstone brick concrete and ceramic.	1.00-1.10	B2	
2.30-2.40 2.40		Destructured medium strong reddish brown fine to coarse SANDSTONE recovered as slightly clayey very gravelly fine to coarse sand with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone. END OF PIT: Competent sandstone bedrock.	1.50	E3	

Shoring/Support: None Stability: Stable			GENERAL REMARKS No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP119
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1

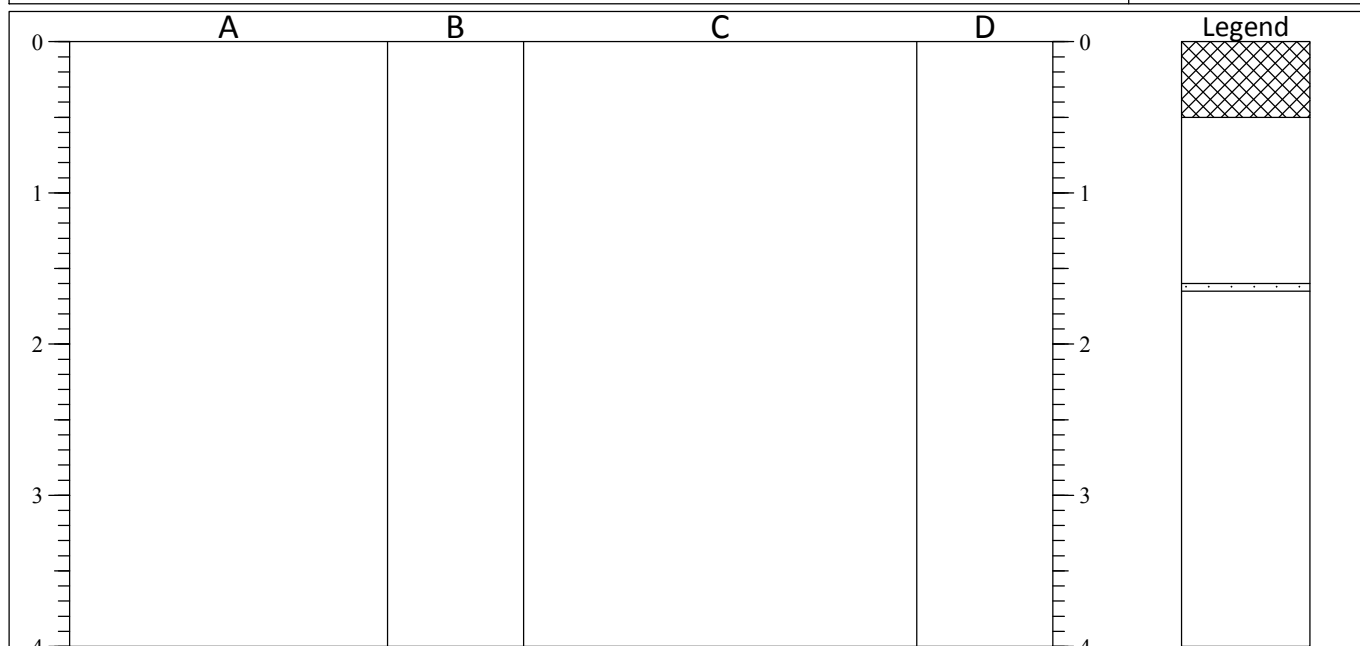


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.75		MADE GROUND: Grey brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of sandstone mudstone brick and metal fragments.			
0.75-0.80		Destructured medium strong reddish brown fine to coarse SANDSTONE recovered as slightly clayey very gravelly fine to coarse sand with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone.	0.50 0.60-0.70	E1 B2	
0.80		END OF PIT: Competent sandstone bedrock.			

Shoring/Support: None Stability: Stable 				GENERAL REMARKS No Visual or olfactory signs of contamination.	
All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL

TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP120
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



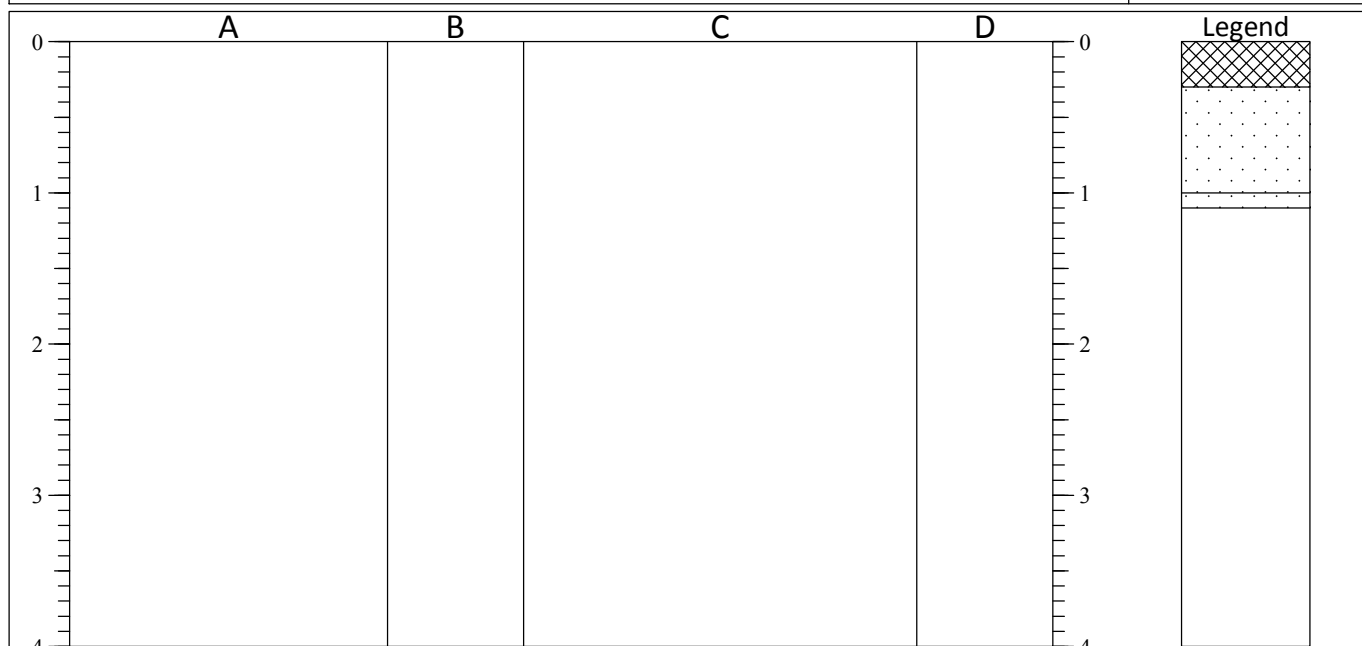
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Grey gravelly fine to coarse SAND with ash. Gravel is fine to coarse angular to rounded of sandstone mudstone brick concrete and ceramic.	0.30	E1	
0.50-1.60		Brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to rounded of sandstone and mudstone.	0.60	E2	
1.60-1.65 1.65		Destructured medium strong reddish brown fine to coarse SANDSTONE recovered as slightly clayey very gravelly fine to coarse sand with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone. END OF PIT: Competent sandstone bedrock.	1.60-1.65	B3	

Shoring/Support: None Stability: Stable	GENERAL REMARKS
	No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used 8 ton tracked excavator.	Logged By FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP121
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



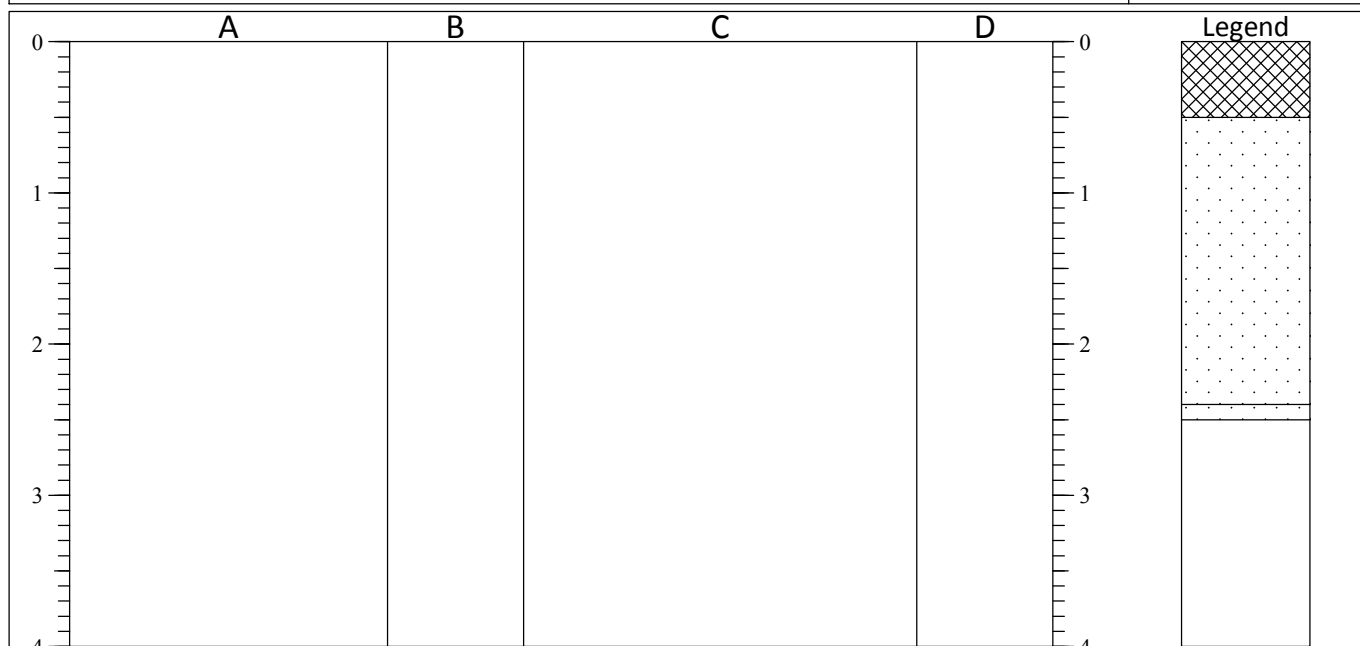
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		MADE GROUND: Grey very gravelly fine to coarse SAND. Gravel is fine to coarse subangular to rounded of sandstone mudstone coal brick and ceramic.	0.20	E1	
0.30-1.00		Brown slightly clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular to rounded of sandstone and mudstone.	0.50	E2	
1.00-1.10		Destructured medium strong reddish brown fine to coarse SANDSTONE recovered as slightly clayey very gravelly fine to coarse sand with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone.	1.00-1.10	B3	
1.10		END OF PIT: Competent sandstone bedrock			

Shoring/Support: None Stability: Stable	GENERAL REMARKS
	No Visual or olfactory signs of contamination.

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used 8 ton tracked excavator.	Logged By FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP122
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



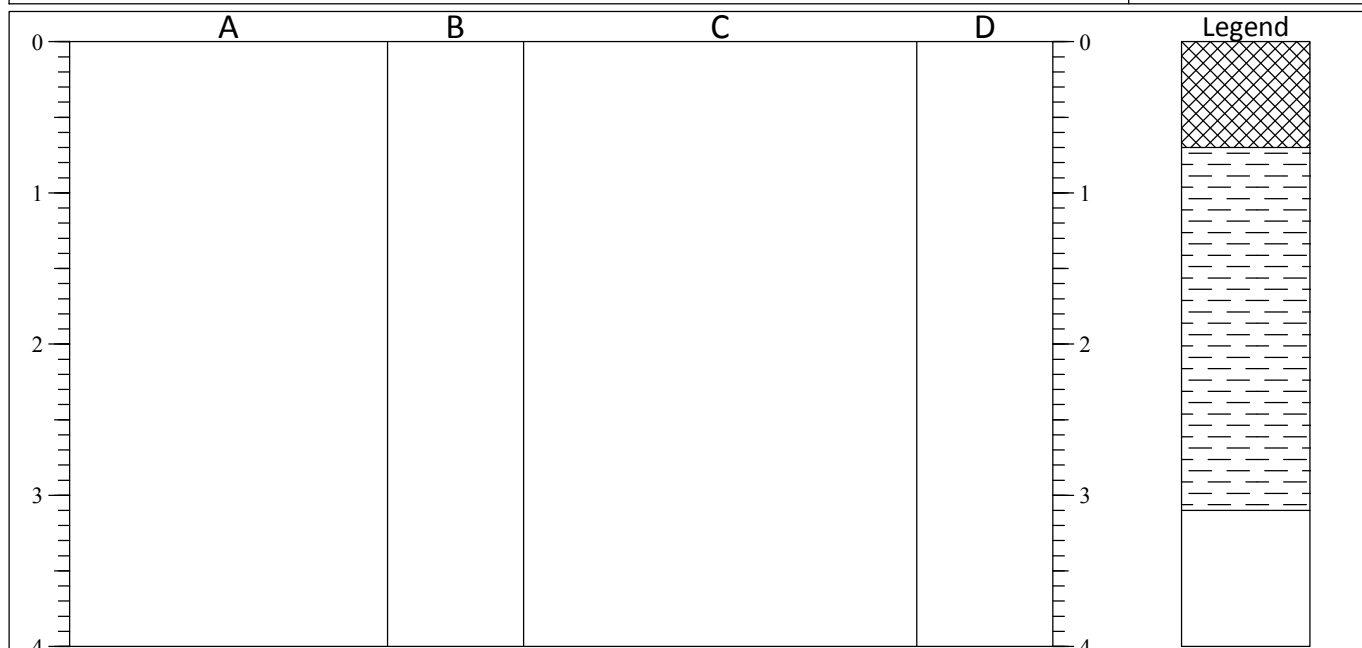
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.50		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete metal plastic and ceramic.	0.30	E1	
0.50-2.40		Brown slightly clayey slightly gravelly fine to coarse SAND with clay lenses. Gravel is fine to coarse subangular to rounded of sandstone and mudstone.	0.60	E2	
2.40-2.50		Destructured medium strong reddish brown fine to coarse SANDSTONE recovered as slightly clayey very gravelly fine to coarse sand with medium cobble content. Gravel is fine to coarse angular to subangular of sandstone. Cobbles are angular to subangular of sandstone.	1.90-2.00	B3	
2.50		END OF PIT: Competent sandstone bedrock.			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP123
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



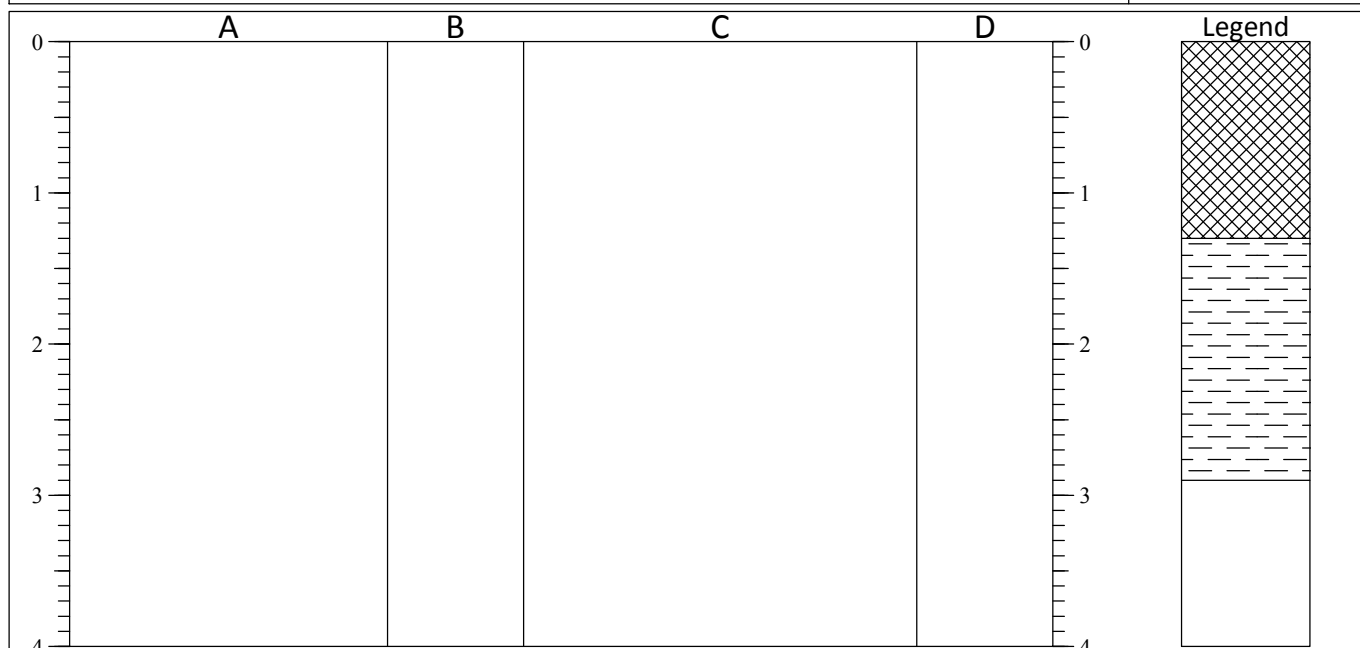
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.70		MADE GROUND: Grey gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete metal plastic and ceramic.	0.00	E1	
0.70-3.10		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.30 Becomes stiff. 2.50 Becomes very stiff.	1.00-1.10	D2	
			2.00-2.10	D3	
3.10		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP124
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



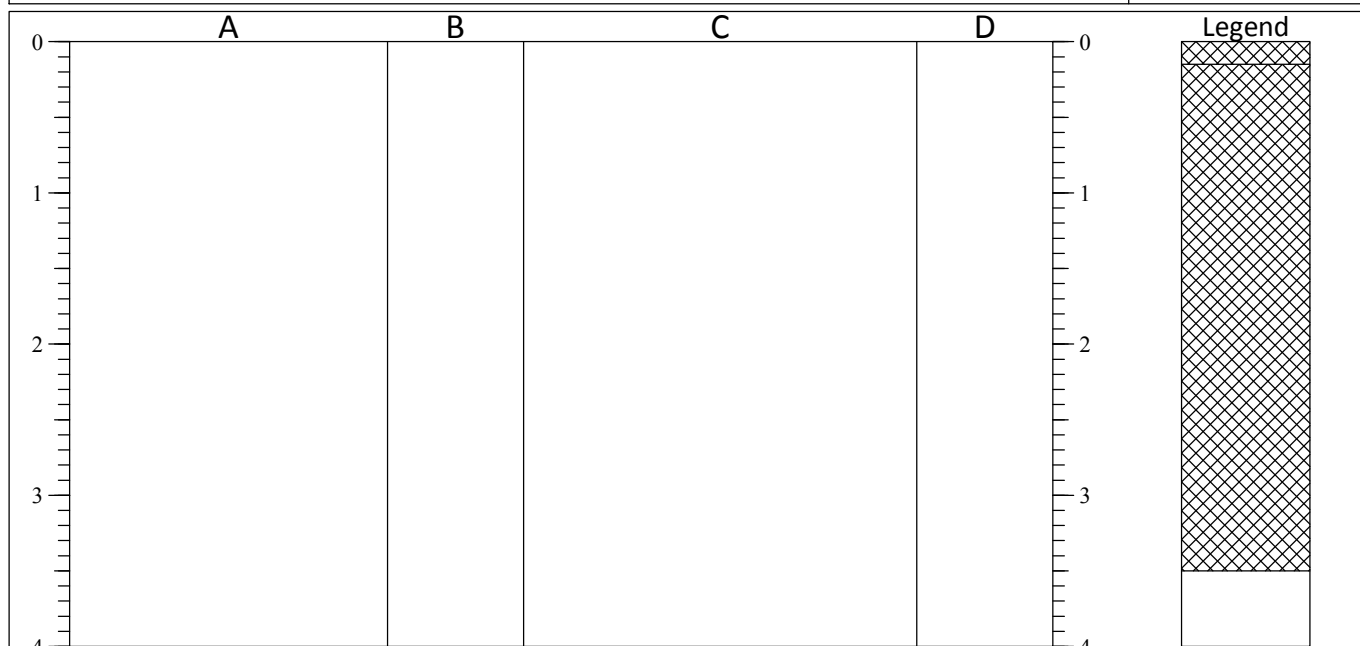
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.30		MADE GROUND: Firm brown mottled grey and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone brick concrete and plastic.	0.30	E1	
1.30-2.90		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal. 1.90 Becomes stiff.	1.40 1.50-1.60	E2 D3	
2.90		END OF PIT	2.50-2.60	D4	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP125
Job No 8190	Date 22-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1

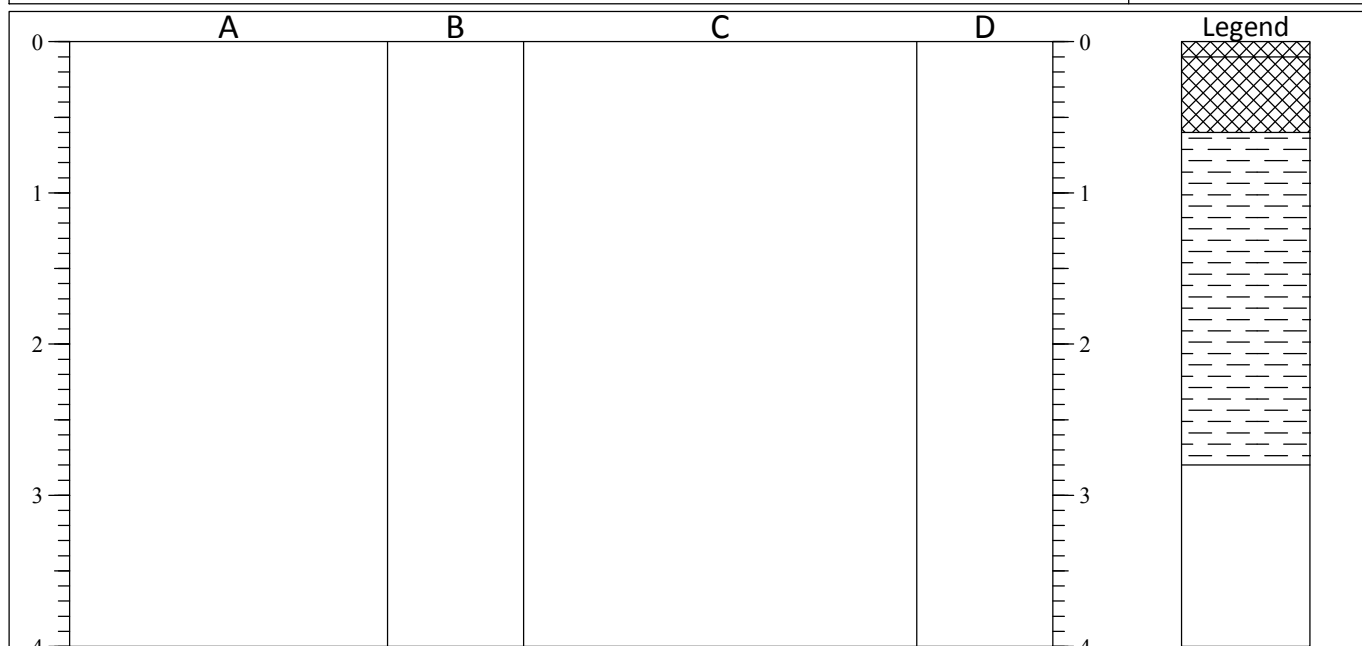


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.15		MADE GROUND: Grey gravelly fine to coarse SAND with ash. Gravel is fine to coarse angular to rounded of sandstone mudstone brick concrete and ceramic. MADE GROUND: Firm blackish brown slightly gravelly sandy CLAY. Gravel is fine to coarse angular to subrounded of sandstone mudstone coal brick concrete ceramic plastic glass and rubber.	0.30	E1	
0.15-3.50			0.80	E2	
			1.00-1.10	D3	
			2.00-2.10	D4	
3.50		END OF PIT.			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.
All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used 8 ton tracked excavator.	

TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP126
Job No 8190	Date 23-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



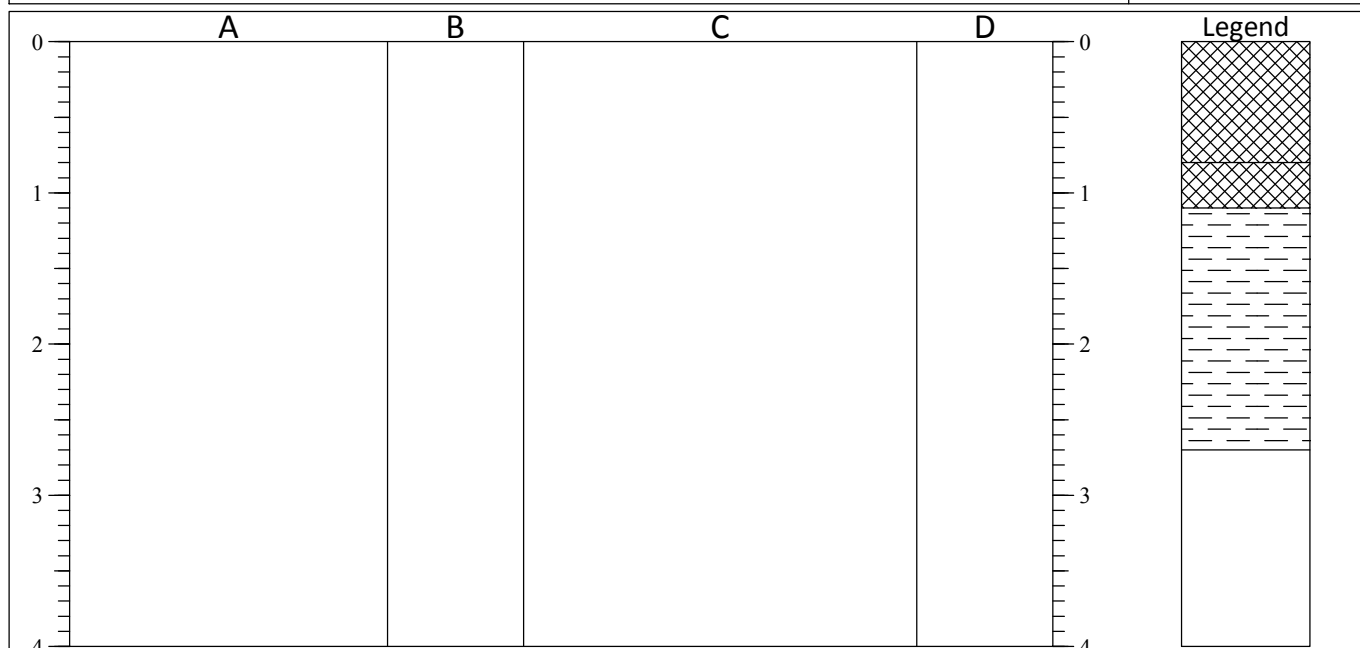
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.10		MADE GROUND: Grey brown slightly clayey slightly gravelly sandy TOPSOIL with rootlets. Gravel is fine to medium angular to subrounded of sandstone mudstone coal brick and glass.			
0.10-0.60					
0.60-2.80					
		MADE GROUND: Brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone mudstone rare basalt concrete brick ceramic and plastic.	0.70	E1	
		Firm grey brown mottled orange and black slightly gravelly sandy CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	1.00	E2	
		1.50 Becomes stiff			
		2.70 Becomes very stiff	2.00-2.10	D3	
2.80		END OF PIT			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
--	--	--	--	--

All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP127
Job No 8190	Date 23-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



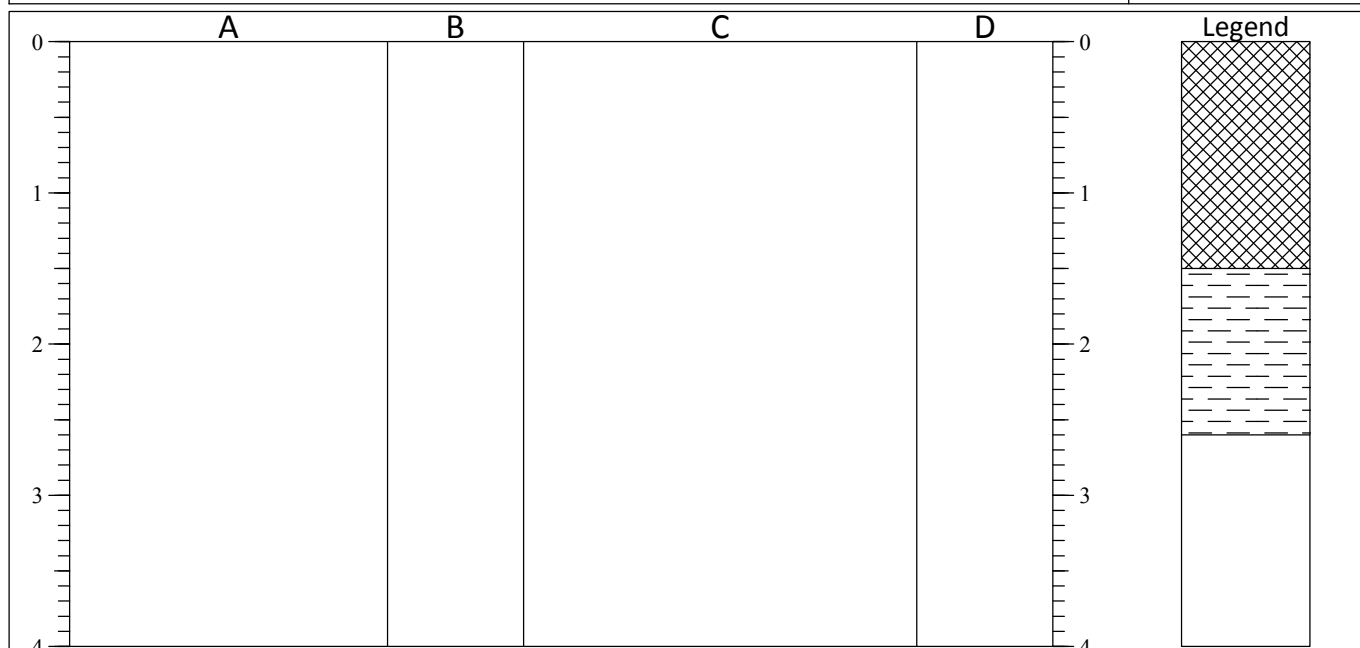
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		MADE GROUND: Grey brown slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of sandstone mudstone coal brick concrete metal plastic and ceramic.	0.50	E1	
0.80-1.10		MADE GROUND: Grey black very sandy fine to coarse angular to subrounded gravel of sandstone mudstone brick and concrete.(Strong solvent odour)			
1.10-2.70		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	1.50-1.60	D2	
		2.10 Becomes stiff.	2.50-2.60	D3	
2.70		END OF PIT.			

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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TRIAL PIT LOG

Project Waters Edge				TRIAL PIT No TP128
Job No 8190	Date 23-01-20	Ground Level (m)	Co-Ordinates ()	
Contractor G & AM Lawson Plant Hire Ltd				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.50		MADE GROUND: Grey slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of sandstone mudstone brick and plastic.	0.60	E1	
1.50-2.60		Firm grey brown mottled orange and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to rounded of sandstone mudstone and coal.	1.50-1.60	D2	
		2.20 Becomes stiff.			
2.60		END OF PIT	2.50-2.60	D3	

Shoring/Support: None Stability: Stable 			GENERAL REMARKS No Visual or olfactory signs of contamination.	
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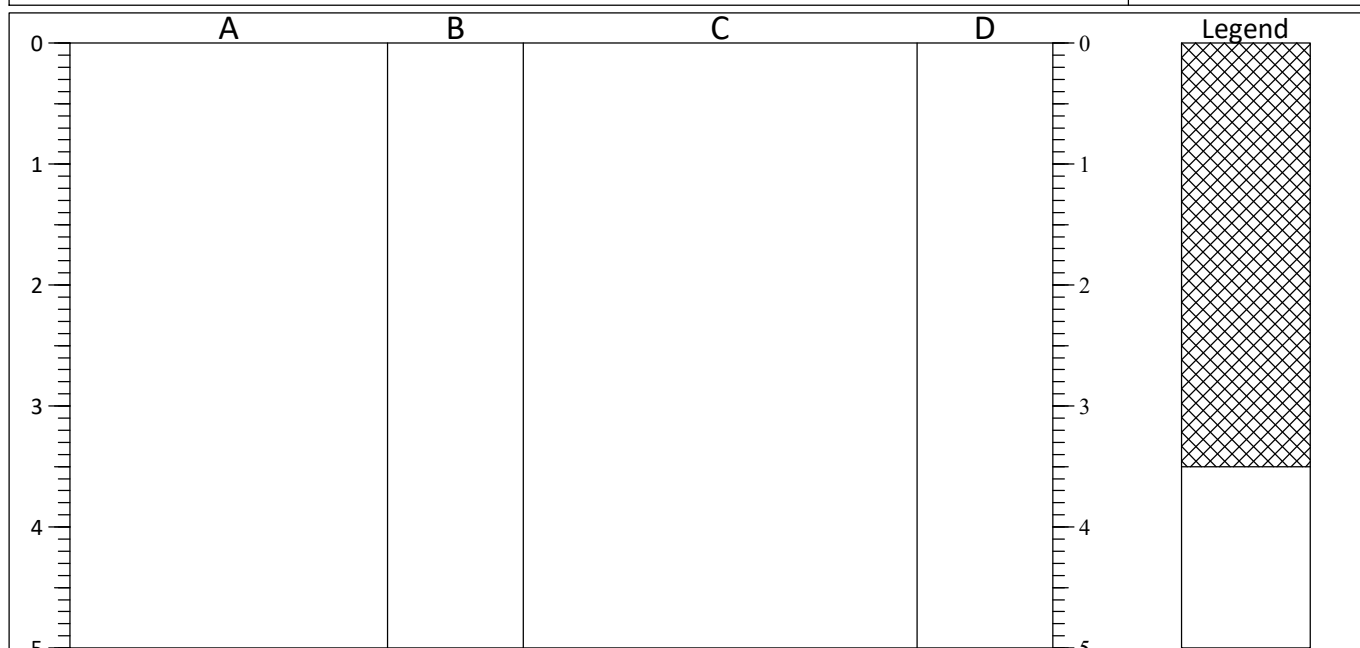
All dimensions in metres Scale 1:50	Client Gleeson Homes Cumbria	Method/ Plant Used	8 ton tracked excavator.	Logged By	FL
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APPENDIX 2.3

FWS 2022

TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP209
Job No 8190	Date 12-10-22	Ground Level (m)	Co-Ordinates ()	
Contractor				Sheet 1 of 1



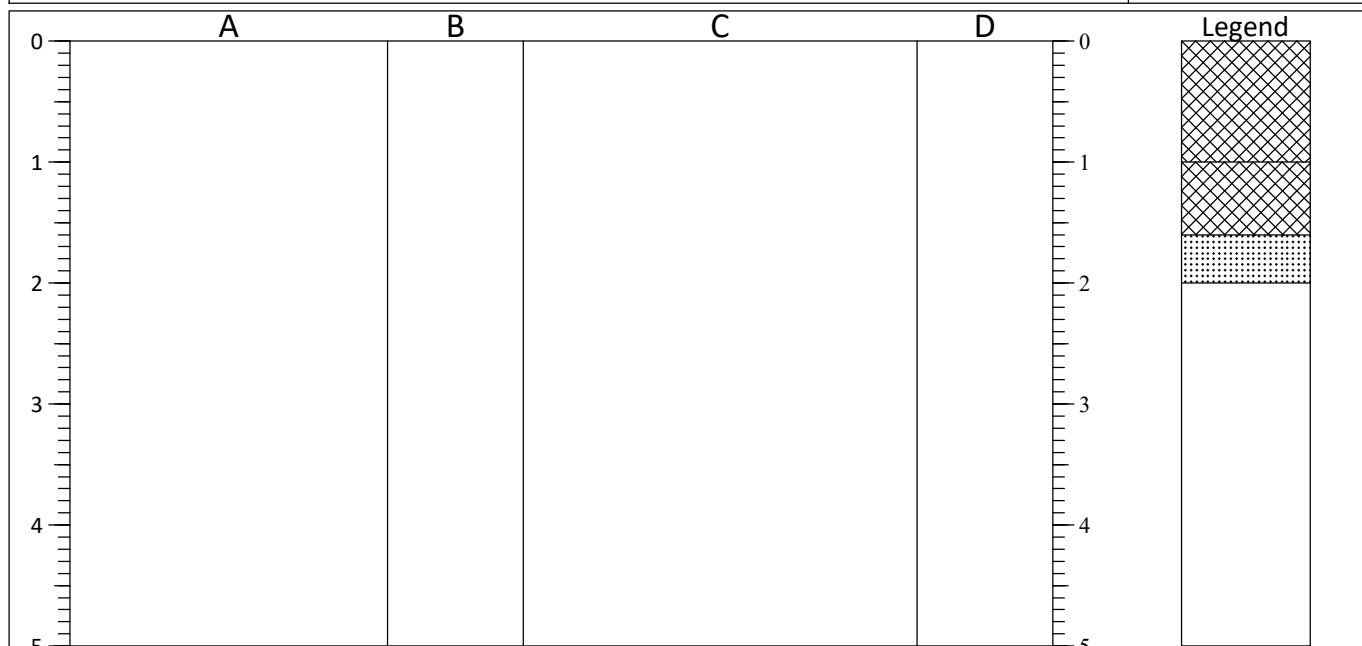
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-3.50		MADE GROUND: Dense grey slightly clayey sandy fine to coarse subrounded to angular GRAVEL of slag concrete brick snadstone limestone anhydrite and coal.	2.00	B	
3.50		End of excavation.			

Shoring/Support: Stability: Unstable from 3 mbgl	GENERAL REMARKS No odours or oily stainings. Large water ingress from 3.0mbgl.
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All dimensions in metres Scale 1:62.5	Client Gleeson Homes Cumbria	Method/ Plant Used	Tracked 360 Excavator	Logged By	AF
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP210
Job No 8190	Date 12-10-22	Ground Level (m)	Co-Ordinates ()	
Contractor				Sheet 1 of 1



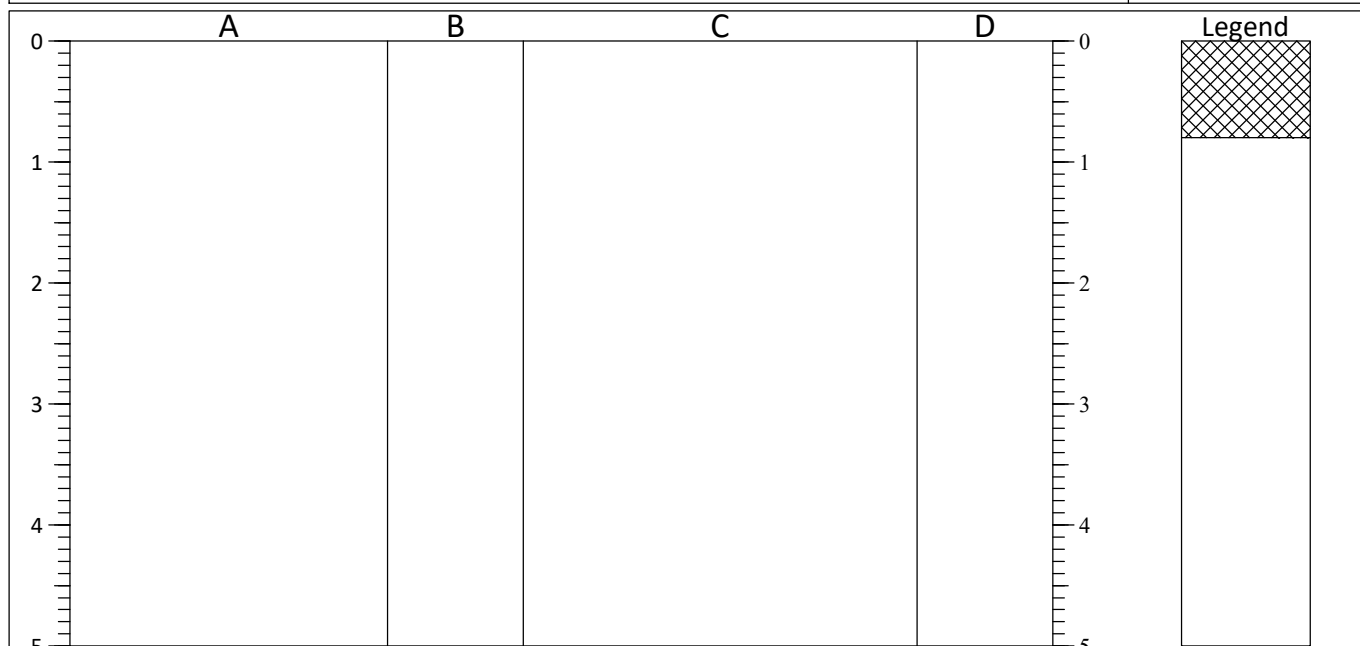
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.00		MADE GROUND: Dense grey slightly clayey sandy fine to coarse subrounded to angular GRAVEL of slag concrete brick snadstone limestone anhydrite and coal.			
1.00-1.60		MADE GROUND: Soft dark brown sandy organic CLAY.			
1.60-2.00		Weathered sandstone bedrock recovered as dense reddish brown clayey sandy fine to coarse angular GRAVEL and COBBLE of sandstone.	1.50	D	
2.00		End of excavation.			

Shoring/Support: Stability: Stable 			GENERAL REMARKS Slight organic odour from 1.0 to 1.6mbgl. No oily stainings. Damp from 2.0mbgl.	
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All dimensions in metres Scale 1:62.5	Client Gleeson Homes Cumbria	Method/ Plant Used	Tracked 360 Excavator	Logged By	AF
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP211
Job No 8190	Date 12-10-22	Ground Level (m)	Co-Ordinates ()	
Contractor				Sheet 1 of 1



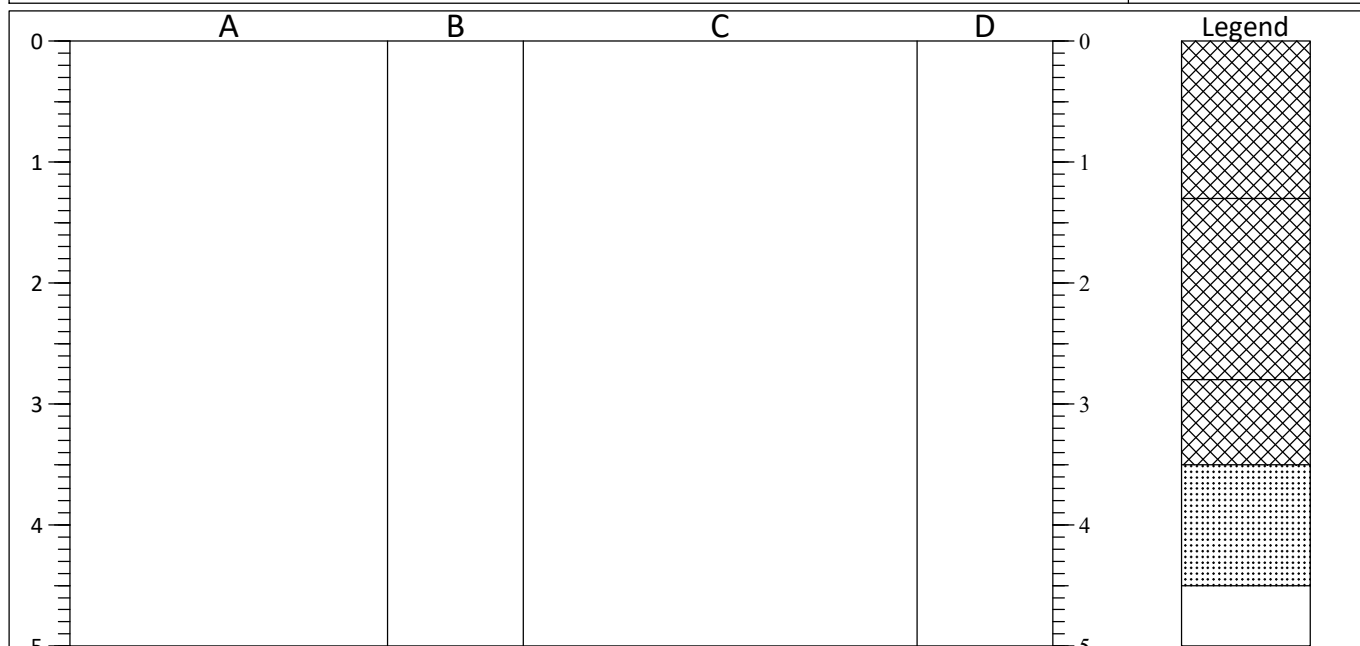
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.80		MADE GROUND: Dense grey to brown slightly clayey sandy fine to coarse subrounded to angular GRAVEL of sandstone mudstone slag concrete and coal.			
0.80		End of excavation on concrete slab obstruction.	0.70	B	

Shoring/Support: Stability: Stable	GENERAL REMARKS No odours or oily stainings. Medium water ingress from 0.8mbgl. Concrete slab obstruction at 0.8mbgl.
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All dimensions in metres Scale 1:62.5	Client Gleeson Homes Cumbria	Method/ Plant Used	Tracked 360 Excavator	Logged By	AF
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP212
Job No 8190	Date 12-10-22	Ground Level (m)	Co-Ordinates ()	
Contractor				Sheet 1 of 1



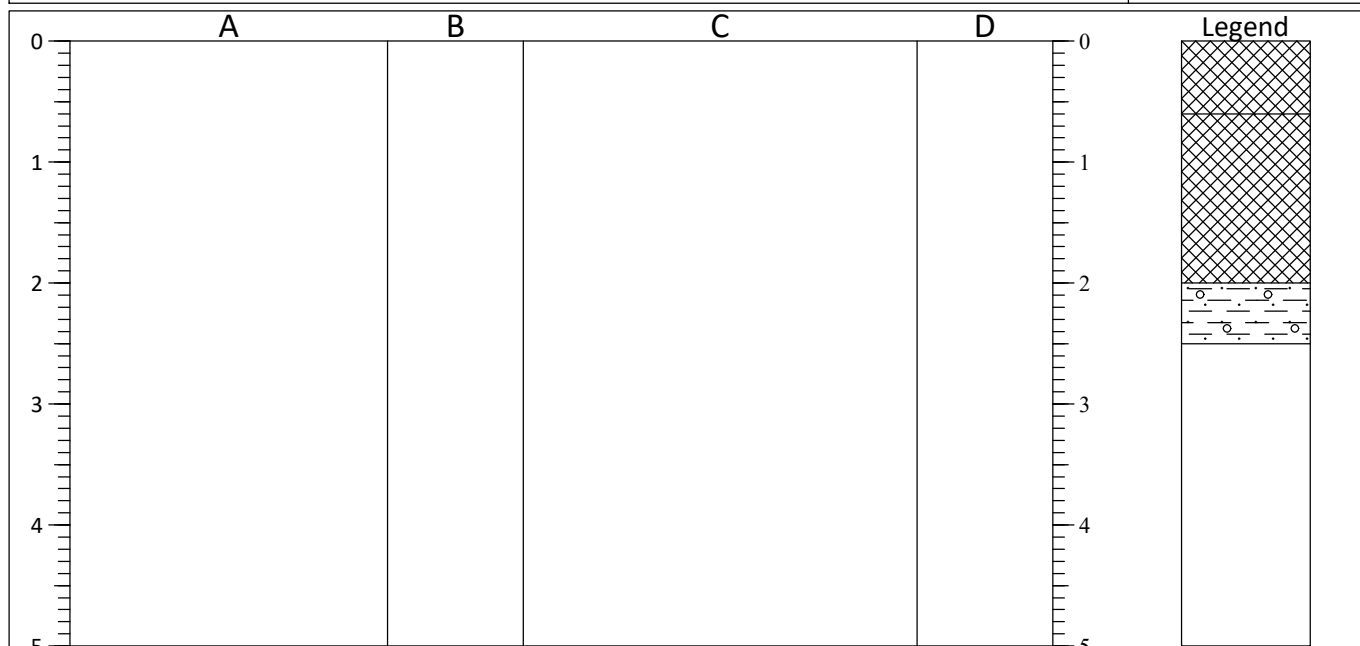
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-1.30		MADE GROUND: Dense grey slightly clayey sandy fine to coarse subrounded to angular GRAVEL of slag concrete brick sandstone limestone anhydrite and coal.			
1.30-2.80		MADE GROUND: Firm brown sandy gravelly CLAY with frequent dark grey organic clay lumps. Gravel is fine to coarse subrounded to angular of sandstone brick and slag.	2.00	D	
2.80-3.50		MADE GROUND: Medium dense dark grey sandy fine to coarse angular GRAVEL of ash and limestone.			
3.50-4.50		Weathered sandstone bedrock recovered as dense reddish brown clayey sandy fine to coarse angular GRAVEL and COBBLE of sandstone.	3.60	B	
4.50		End of excavation.			

Shoring/Support: Stability: Unstable from 3.5 mbgl 			GENERAL REMARKS Slight organic odour from 1.3 to 2.8mbgl. No oily stainings. Large water ingress from 4.0mbgl.	
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All dimensions in metres Scale 1:62.5	Client Gleeson Homes Cumbria	Method/ Plant Used	Tracked 360 Excavator	Logged By	AF
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TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP213
Job No 8190	Date 12-10-22	Ground Level (m)	Co-Ordinates ()	
Contractor				Sheet 1 of 1

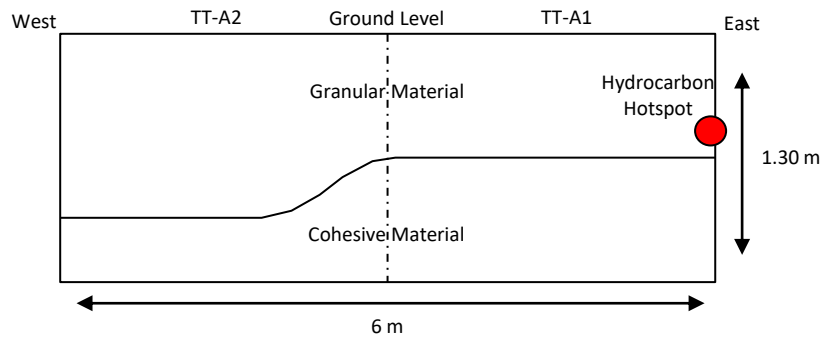


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.60		MADE GROUND: Dense grey slightly clayey sandy fine to coarse subrounded to angular GRAVEL of slag concrete brick sandstone limestone anhydrite and coal.			
0.60-2.00		MADE GROUND: Stiff brown sandy gravelly CLAY with occasional pockets of dark grey clay. Gravel is fine to coarse angular of sandstone mudstone coal and brick.	1.00 1.00	D HV	145
2.00-2.50		Stiff greyish brown sandy gravelly CLAY. Gravel is fine to carse angular of sandstone mudstone and coal.			
2.50		End of excavation.	2.40 2.50	D HV	200

Shoring/Support: Stability: Stable 				GENERAL REMARKS No odours or oily stainings. No groundwater encountered. Hand Vane values in kPa.	
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All dimensions in metres Scale 1:62.5	Client Gleeson Homes Cumbria	Method/ Plant Used	Tracked 360 Excavator	Logged By	AF
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GENERAL CROSS SECTION OF TRENCH TT-A



TT-A1 DETAILED LOG

- 0.00 – 0.30: MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone slag and clay pipe.
- 0.30 – 0.45: MADE GROUND: Dense dark grey sandy fine to coarse subrounded to subangular GRAVEL of slag ash and limestone with strong hydrocarbon odour.
- 0.45 – 0.70: MADE GROUND: Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular of sandstone and coal.
- 0.70 – 1.00: MADE GROUND: Stiff dark grey slightly sandy slightly gravelly organic CLAY with rootlets. Gravel is fine to medium angular of mudstone.
- 1.00 – 1.30: Stiff light brown slightly sandy CLAY.
- 1.30: End of excavation

TT-A1 REMARKS

Strong hydrocarbon odour from 0.30 to 0.45mbgl and at 1.20mbgl.
Oily staining noted at 1.20mbgl.
Medium water ingress at 1.20mbgl.

TT-A2 DETAILED LOG

- 0.00 – 0.30: MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone slag and clay pipe.
- 0.30 – 1.20: MADE GROUND: Dense dark grey sandy fine to coarse subrounded to angular GRAVEL of ash and limestone with slight hydrocarbon odour.
- 1.20 – 1.30: MADE GROUND: Stiff dark grey slightly sandy slightly gravelly organic CLAY with rootlets. Gravel is fine to medium angular of mudstone.
- 1.30: End of excavation

TT-A2 REMARKS

Slight hydrocarbon odour from 0.30 to 1.20mbgl.
No oily staining.
No groundwater encountered.

SAMPLES

- TT-A1:
- D/J at 0.40m
 - D/J at 0.80m
 - D/J at 1.20m
- TT-A2:
- D/J at 0.70m

NOTES / KEY

Date Completed: 11/10/2022
Plant Used: Tracked 360 Excavator

DRAWING TITLE

TRIAL TRENCH LOG IN VICINITY OF
HYDROCARBON HOTSPOT – TT-A

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

AF

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

October 2022

DRG. No.

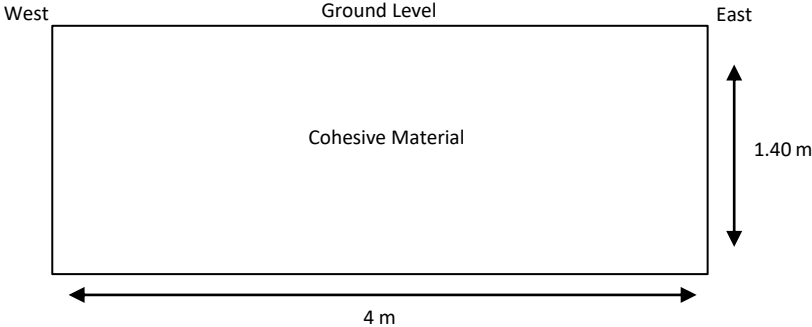
LOG 1

FWS Geological &
Geo-Environmental
Consultants

1 Redwood Crescent
Office 1.8, Peel Park
East Kilbride
South Lanarkshire
G74 5PA

Tel: 01355 207778
admin@fwsconsultants.com www.fwsconsultants.com

GENERAL CROSS SECTION OF TRENCH TT-B



TT-B DETAILED LOG

- 0.00 – 0.30: MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone slag and clay pipe.
- 0.30 – 1.10: MADE GROUND: Stiff dark grey very sandy gravelly CLAY. Gravel is fine to coarse subangular of ash sandstone brick concrete and slag.
- 1.10 – 1.40: MADE GROUND: Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular of sandstone and coal.
- 1.40: End of excavation

TT-B REMARKS

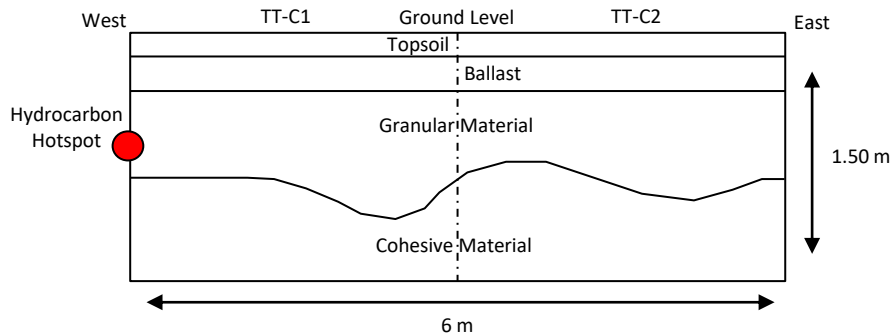
No odours or oily staining
No groundwater encountered.

SAMPLES

- D/J at 0.80m

NOTES / KEY Date Completed: 12/10/2022 Plant Used: Tracked 360 Excavator	DRAWING TITLE TRIAL TRENCH LOG IN VICINITY OF HYDROCARBON HOTSPOT – TT-B	CLIENT GLEESON HOMES CUMBRIA		FWS Geological & Geo-Environmental Consultants 1 Redwood Crescent Office 1.8, Peel Park East Kilbride South Lanarkshire G74 5PA Tel: 01355 207778 admin@fwsconsultants.com www.fwsconsultants.com
	PROJECT TITLE WATER’S EDGE, WHITEHAVEN	STATUS FINAL	PROJECT NUMBER 8190	
		DRAWN BY AF	DATE October 2022	
		SCALE NOT TO SCALE	DRG. No. LOG 2	

GENERAL CROSS SECTION OF TRENCH TT-C



TT-C1 DETAILED LOG

- 0.00 – 0.30: MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone slag and clay pipe.
- 0.30 – 0.50: MADE GROUND: Dense grey coarse angular GRAVEL of limestone (Ballast)
- 0.50 – 1.10: MADE GROUND: Dense dark grey clayey sandy fine to coarse angular GRAVEL of ash limestone and slag with strong hydrocarbon odour.
- 1.10 – 1.50: Stiff brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular of sandstone.
- 1.50: End of excavation

TT-C1 REMARKS

Strong hydrocarbon odour from 0.50 to 1.50mbgl.
Oily staining noted at 0.90mbgl.
Medium water ingress at 0.80mbgl.

TT-C2 DETAILED LOG

- 0.00 – 0.30: MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone slag and clay pipe.
- 0.30 – 0.50: MADE GROUND: Dense grey coarse angular GRAVEL of limestone (Ballast)
- 0.50 – 1.10: MADE GROUND: Dense dark grey clayey sandy fine to coarse angular GRAVEL of ash limestone and slag.
- 1.10 – 1.50: Stiff brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular of sandstone.
- 1.50: End of excavation

TT-C2 REMARKS

No odours or oily staining.
Damp from 0.8mbgl.

SAMPLES

- TT-C1:
- D/J at 0.90m
 - D/J at 1.20m

- TT-C2:
- D/J at 0.80m
 - D/J at 1.20m

NOTES / KEY

Date Completed: 11/10/2022
Plant Used: Tracked 360 Excavator
Excavation was unstable from 1.0m in TT-C2

DRAWING TITLE

TRIAL TRENCH LOG IN VICINITY OF
HYDROCARBON HOTSPOT – TT-C

PROJECT TITLE

WATER'S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

AF

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

October 2022

DRG. No.

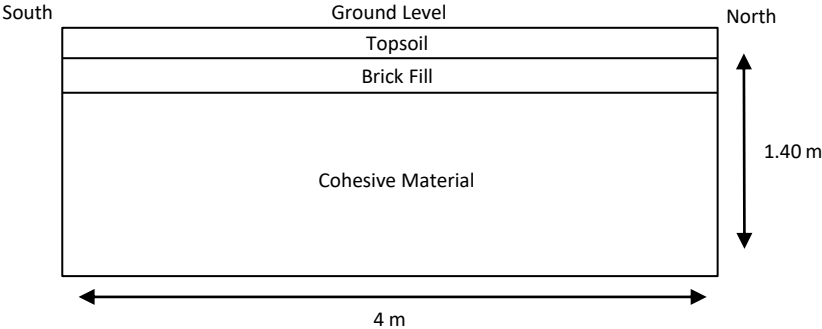
LOG 3

FWS Geological &
Geo-Environmental
Consultants

1 Redwood Crescent
Office 1.8, Peel Park
East Kilbride
South Lanarkshire
G74 5PA

Tel: 01355 207778
admin@fwsconsultants.com www.fwsconsultants.com

GENERAL CROSS SECTION OF TRENCH TT-D



TT-D DETAILED LOG

0.00 – 0.30:	MADE GROUND: Grass over dark brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular of concrete sandstone and slag.
0.30 – 0.70:	MADE GROUND: Dense reddish brown fine to coarse angular GRAVEL and COBBLE of brick. (Brick fill)
0.70 – 1.40:	MADE GROUND: Stiff brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse angular of sandstone mudstone and coal.
1.40:	End of excavation

TT-D REMARKS

No odours or oily staining
No groundwater encountered.

SAMPLES

- D/J at 1.00m

NOTES / KEY

Date Completed: 12/10/2022
Plant Used: Tracked 360 Excavator

DRAWING TITLE

TRIAL TRENCH LOG IN VICINITY OF
HYDROCARBON HOTSPOT – TT-D

PROJECT TITLE

WATER’S EDGE, WHITEHAVEN

CLIENT

GLEESON HOMES CUMBRIA

STATUS

FINAL

DRAWN BY

AF

SCALE

NOT TO SCALE

PROJECT NUMBER

8190

DATE

October 2022

DRG. No.

LOG 4

FWS Geological &
Geo-Environmental
Consultants

1 Redwood Crescent
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East Kilbride
South Lanarkshire
G74 5PA

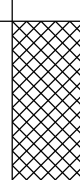
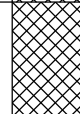
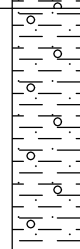
Tel: 01355 207778
admin@fwsconsultants.com www.fwsconsultants.com

APPENDIX 2.4

FWS 2023

BOREHOLE LOG

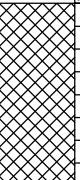
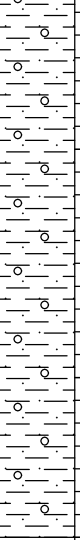
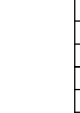
Project Water's Edge, Whitehaven				BOREHOLE No WS301	
Job No 8190	Date 08-03-23	Ground Level (m)	Co-Ordinates ()		
Contractor Geospek				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20 0.20	E PID	5ppm	 			(0.80) 0.80	MADE GROUND: Greyish dark brown slightly clayey slightly sandy fine to coarse angular to subangular GRAVEL of mudstone sandstone and concrete.		
0.90 0.90	E PID	1ppm				(0.50) 1.30	MADE GROUND: Black slightly sandy fine to coarse angular to subangular GRAVEL of mudstone shale ash and slag.		
1.40 1.40	E PID	0ppm				(1.10) 2.40	Firm brown with grey mottling sandy gravelly CLAY. Gravel is fine to medium subangular of sandstone and mudstone. 1.80 Becomes stiff. Gravel includes coal. 2.00 - 2.40 Becomes soft		
2.30 2.30	E PID	0ppm				(1.10) 3.50	Stiff reddish brown sandy gravelly CLAY. Gravel is fine to medium subrounded of sandstone and mudstone.		
3.10 3.10	E PID	0ppm							
							End of borehole due to refusal on sandstone cobble.		

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 1.0 m. No visual signs of contamination. Strong hydrocarbon odour from ground level to 1.3 m.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

Project Water's Edge, Whitehaven				BOREHOLE No WS302
Job No 8190	Date 09-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.40 0.40	E PID	Oppm				(0.80)	MADE GROUND: Soft dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone brick concrete and fused slag.		
0.70 0.70	E PID	Oppm				0.80			
1.20 1.20	E PID	Oppm					Firm brown sandy gravelly CLAY. Gravel is fine to coarse subrounded of sandstone and mudstone.		
2.50	E					(3.90)	1.80 Becomes stiff. 2.00 Gravel becomes fine to medium.		
4.00	E					4.70	3.60 Becomes dark grey. 4.00 Gravel becomes fine to coarse. Includes rare coal. 4.10 - 4.40 Brown fine to coarse sand lens. 4.50 - 4.70 Brown fine to coarse sand lens.		
							End of borehole due to refusal on sandstone cobble.		

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 signs of contamination. Hydrogen sulphide odour from ground level to 0.8 m.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

Project Water's Edge, Whitehaven				BOREHOLE No WS303
Job No 8190	Date 10-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

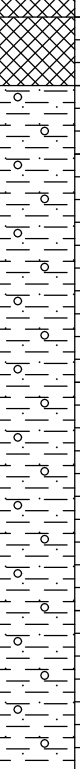
SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.30 0.30	E PID	0ppm					Soft brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone.		
1.50 1.50	E PID	0ppm					1.60 Becomes firm.		
2.50 2.50	E E					(5.00)	2.30 Becomes slightly sandy.		
3.50 3.50	E E						3.00 Becomes grey.		
						5.00	End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	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 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used		Minirig		Logged By JR	

AGS3 UK BH NEW 8190.7 - WS LOGS.GPJ AGS3 ALL.GDT 12/4/23

BOREHOLE LOG

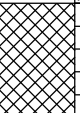
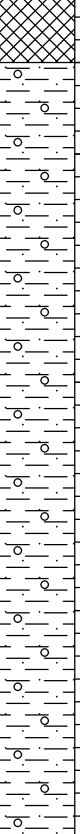
Project Water's Edge, Whitehaven				BOREHOLE No WS304
Job No 8190	Date 08-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10 0.10	E PID	1ppm				(0.30) 0.30	MADE GROUND: Soft dark brown sandy very gravelly CLAY with a low cobble content of concrete. Gravel is fine to coarse angular to subangular of sandstone mudstone and concrete.		
0.50 0.50	E PID	10ppm				(0.70) 1.00	MADE GROUND: Firm reddish brown sandy gravelly CLAY. Gravel is fine to coarse angular to subangular of sandstone mudstone brick and concrete.		
1.30 1.30	E PID	9ppm				(0.40) 1.40	MADE GROUND: Soft brown with black mottling very sandy very gravelly CLAY. Gravel is fine to medium subangular of mudstone sandstone slag and brick.		
1.90 1.90	E PID	1ppm				(0.30) 1.70	MADE GROUND: Soft reddish brown with grey mottling very sandy very gravelly CLAY. Gravel is fine to medium subangular of mudstone sandstone and rare slag.		
2.50	E					(3.00) 4.70	Firm yellowish brown sandy gravelly CLAY. Gravel is fine to medium subangular of sandstone mudstone and rare coal. 2.20 Becomes stiff and reddish brown. Gravel is subangular to subrounded. 3.00 Gravel of sandstone and mudstone.		
							End of borehole due to refusal on sandstone cobble.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	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 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

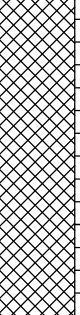
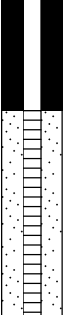
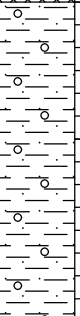
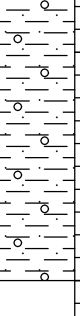
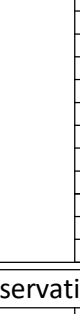
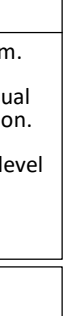
Project Water's Edge, Whitehaven				BOREHOLE No WS305
Job No 8190	Date 09-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10 0.10	E PID	Oppm				(0.50) 0.50	MADE GROUND: Soft brown sandy gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone brick and concrete.		
0.60 0.60	E PID	3ppm				(0.40) 0.90	MADE GROUND: Soft black sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone slag brick and ash.		
0.95 0.95	E PID	Oppm				(0.70) 1.60	MADE GROUND: Firm brown with grey mottling sandy gravelly CLAY. Gravel is fine to medium subangular of mudstone sandstone slag and ash.		
1.80 1.80	E PID	Oppm				(3.40) 5.00	Stiff reddish brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone and mudstone. 3.00 Becomes very stiff.		
3.50	E								
							End of borehole.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. Small seepage encountered at 0.4 m. No visual signs of contamination. Very strong acrylic odour from 0.5 m to 1.6 m.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

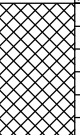
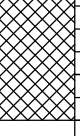
Project Water's Edge, Whitehaven				BOREHOLE No WS306
Job No 8190	Date 08-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.10 0.10	E PID	20ppm				(1.40)	MADE GROUND: Soft brown very sandy gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone sandstone brick and concrete with rare ceramics. 0.20 Low cobble content of concrete. 0.50 Becomes blackish dark brown.		
0.90 0.90	E PID	12ppm				1.40			
1.20 1.20	E PID	56ppm							
1.50 1.50	E PID	4ppm							
2.50	E					(2.60)			
						4.00			
							End of borehole due to refusal on sandstone cobble.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.2 m. No groundwater encountered. No visual signs of contamination. Strong hydrocarbon odour from ground level to 1.4 m.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

Project Water's Edge, Whitehaven				BOREHOLE No WS307
Job No 8190	Date 09-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 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	E	Oppm				(1.20)	MADE GROUND: Soft brown very sandy very gravelly CLAY with a low cobble content of concrete. Gravel is fine to coarse angular to subangular of mudstone sandstone fused slag brick with rare concrete and clay pipe.		
0.90 0.90	E	Oppm				1.20	0.80 Gravel includes frequent fused slag.		
							End of borehole due to refusal on sandstone bedrock.		

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 signs of contamination. Weak hydrogen sulphide odour from ground level to 1.2 m.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

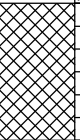
Project Water's Edge, Whitehaven				BOREHOLE No WS308
Job No 8190	Date 09-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.20	E					(0.30)	MADE GROUND: Soft dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone brick concrete and fused slag.		
0.20	PID	Oppm				0.30			
0.30-0.50	D					0.50	MADE GROUND: Bluish grey sandy fine to coarse angular to subangular GRAVEL of fused slag.		
0.30	PID	Oppm				0.70			
0.60	E					0.90	MADE GROUND: Soft dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone sandstone and brick.		
0.60	PID	Oppm				1.00			
0.80	E						Brown very clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse subangular of sandstone.		
0.80	PID	Oppm					Weak whitish grey and pinkish grey fine to coarse SANDSTONE. Distinctly weathered. Recovered as very sandy fine to coarse gravel.		
0.90-1.00	D						End of borehole on sandstone bedrock.		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	
											Hand dug pit to 1.0 m. No groundwater encountered. No visual or olfactory signs of contamination.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

BOREHOLE LOG

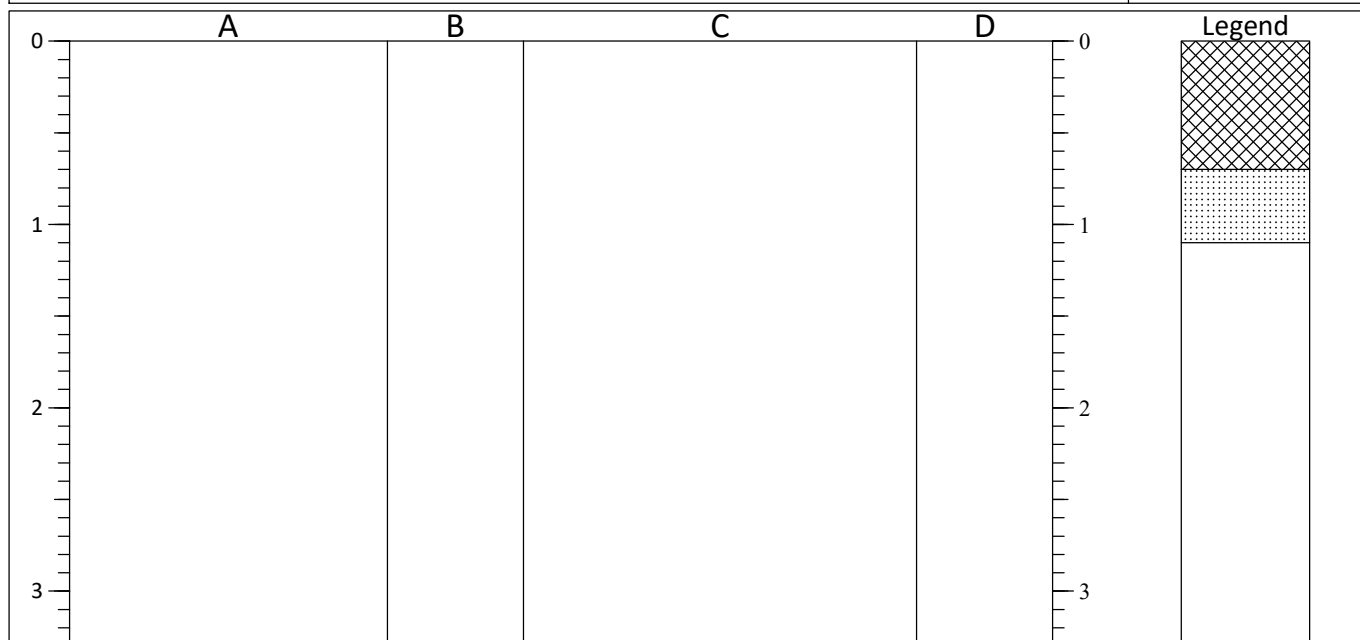
Project Water's Edge, Whitehaven				BOREHOLE No WS309
Job No 8190	Date 09-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Geospek				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	Description		
0.30 0.30	E	4ppm				(0.60) 0.60	MADE GROUND: Soft dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone sandstone fused slag and brick.		
0.70 0.70	E	0ppm				0.80	Firm brown very sandy gravelly CLAY. Gravel is fine to coarse subangular of sandstone and mudstone.		
0.80-0.90	D					0.90	Weak whitish grey fine to coarse SANDSTONE. Distinctly weathered. Recovered as very sandy fine to coarse gravel. End of borehole on sandstone bedrock.		

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 0.9 m. No groundwater encountered. No visual or olfactory signs of contamination.
All dimensions in metres Scale 1:33.125			Client Gleeson Homes, Cumbria			Method/ Plant Used			Minirig		Logged By JR

TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP01
Job No 8190	Date 10-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Gleeson Homes, Cumbria				Sheet 1 of 1



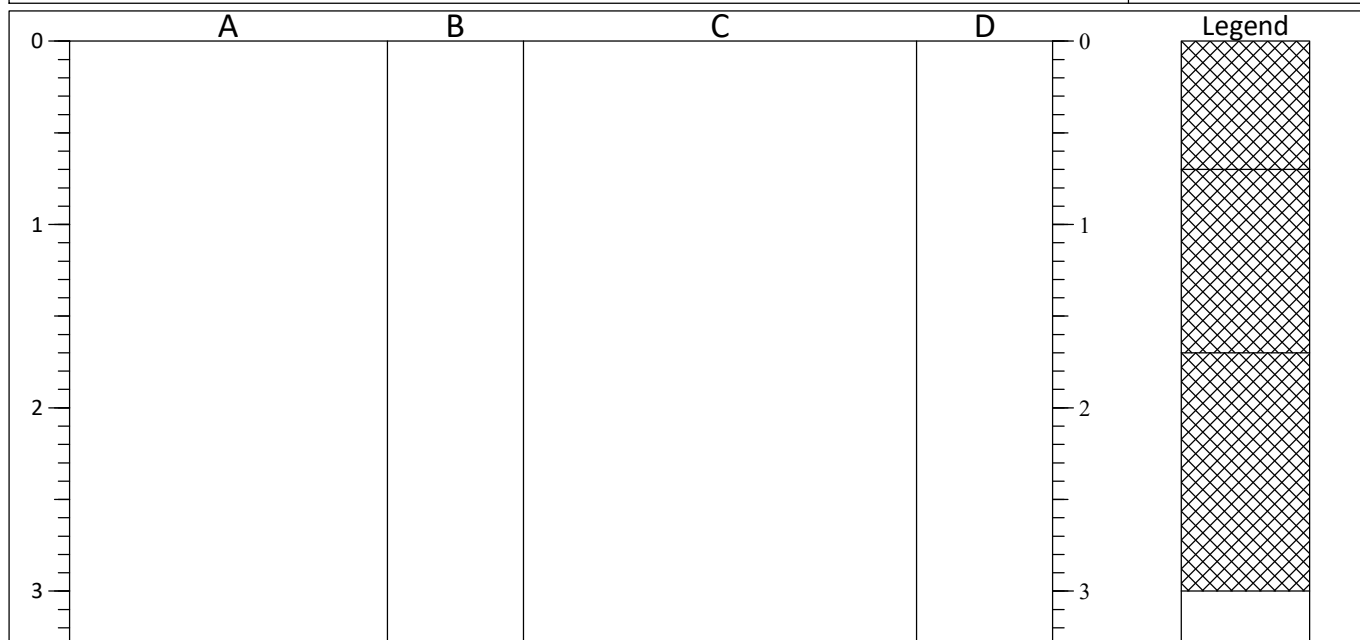
STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.70		MADE GROUND: Soft brown sandy very gravelly CLAY with a low cobble content of concrete. Gravel is fine to coarse angular to subangular of mudstone sandstone fused slag brick and concrete.	0.30 0.30	E PID	0ppm
0.70-1.10		Weak whitish grey fine to coarse SANDSTONE. Distinctly weathered. Recovered as fine to coarse sand and fine to coarse angular gravel.	0.80 0.80	E PID	0ppm
1.10		End of trial pit on sandstone bedrock.			

Shoring/Support: Stability: Stable 			GENERAL REMARKS No groundwater encountered. No visual signs of contamination. Weak hydrogen sulphide odour from ground level to 0.7 m.	
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All dimensions in metres Scale 1:41.25	Client Gleeson Homes, Cumbria	Method/ Plant Used	Excavator	Logged By JR
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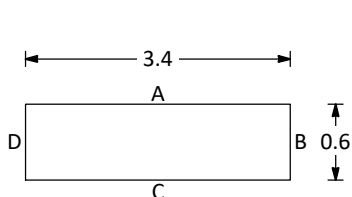
TRIAL PIT LOG

Project Water's Edge, Whitehaven				TRIAL PIT No TP02
Job No 8190	Date 10-03-23	Ground Level (m)	Co-Ordinates ()	
Contractor Gleeson Homes, Cumbria				Sheet 1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.70		MADE GROUND: Soft dark brown sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular of sandstone mudstone brick and concrete.	0.30	E	0ppm
			0.30	PID	
0.70-1.70		0.60 Gravel includes rare plastic wire. MADE GROUND: Firm brown very sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone and rare brick. 1.00 Gravel includes rare plastic.	0.80	E	0ppm
			0.80	PID	
1.70-3.00		MADE GROUND: Soft blackish brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of sandstone mudstone metal wire plastic and brick with rare rootlets. 2.00 Gravel includes rare wooden planks and frequent brick and metal.	1.50	E	0ppm
			1.50	PID	
		2.70 Becomes brown and very gravelly. Gravel of sandstone and mudstone with rare slag.	2.00	E	0ppm
			2.00	PID	
3.00		End of trial pit on potential sandstone bedrock.	2.80	E	0ppm
			2.80	PID	

Shoring/Support:
Stability: Unstable. Collapse on southern wall from 1.5 m to 2.5 m.



GENERAL REMARKS

Damp at 2.7 m. No visual or olfactory signs of contamination.
Install was the following:
1 m of plain pipe and 2 m of slotted pipe.

All dimensions in metres Scale 1:41.25	Client Gleeson Homes, Cumbria	Method/ Plant Used	Excavator	Logged By JR
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APPENDIX 2.5

ADJACENT: OTHERS

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: BH204		PAGE 1 of 2	
	NUMBER	TYPE					DRILLING DATES: 8,9/6/2003		DRILLING METHODS : Air flush rotary	
							DRILLER : Norwest Holst		BOREHOLE DIAMETER : 200 mm	
							LOGGED BY : ARC		SCREEN TYPE & DIAM: HDPE 50mm	
		CHECKED BY :		SCREEN SLOT SIZE: 3 mm						
					0.0		DESCRIPTION		COMMENTS	0.0
			* 3.1		0.0		MADE GROUND: Loose dark brown slightly clayey silt and fine sandy soil with abundant rootlets and frequeunt dark grey pebble sized shale, rare coal and occasional white low density fine grained slag	Damp, NVO	0.0	
			* 0.0		1.0			Damp, NVO	1.0	
					2.0		Soft red sandy CLAY. (BOULDER CLAY).	becoming wet, NVO	2.0	
					3.0				3.0	
			* 0.0		4.0		Soft brown slightly sandy laminated CLAY. (BOULDER CLAY).	Becoming dry at 3.7m bgl	4.0	
					5.0				5.0	
			* 0.0		6.0		Chippings of pink-purple sandstone, quartz, and calcite and abundant pink-purple fine sand. (BROCKRAM).	Dry, NVO	6.0	
					7.0				7.0	
					8.0		Pink fine SANDSTONE. (WHITEHAVEN SANDSTONE).	Dry, NVO	8.0	
			* 0.0		9.0				9.0	
					10.0				10.0	
			* 0.0		11.0				11.0	
					12.0		0.2m thick puple medium sandstone at 12m bgl		12.0	
			* 0.0		13.0		Beige medium SANDSTONE. (WHITEHAVEN SANDSTONE).		13.0	
					14.0		Red coarse SANDSTONE. (WHITEHAVEN SANDSTONE).		14.0	
					15.0		Purple medium SANDSTONE. (WHITEHAVEN SANDSTONE).		15.0	
			* 0.0		16.0		Purple medium to coarse SANDSTONE. (WHITEHAVEN SANDSTONE).		16.0	
				17.0		Becoming damp at 17m bgl, NVO	17.0			
				18.0	becoming fine		18.0			

LOCATION / NOTES:

NVO = No visual or olfactory evidence of contamination

Geosock fitted

LEGEND

- Disturbed Sample
- Undisturbed Sample
- Headspace Analysis
- Down Borehole Analysis
- Groundwater Table
- Perched Water Table

BOREHOLE LOG

Job Title: Further Soil and Groundwater Investigation

Location: Whitehaven, Cumbria

Client: Rhodia

App'd:	Date:
Drawn : ARC	Ref:
Scale: As shown	Job No: 44557-033-787
Drg. Size: A4	BOREHOLE LOG

BOREHOLE CONSTRUCTION	SAMPLE		SOIL VAPOUR (ppm)	GROUNDWATER	DEPTH (m)	GEOLOGY	BOREHOLE NUMBER: BH204		PAGE 2 of 2	
	NUMBER	TYPE					DRILLING DATES: 8,9/6/2003		DRILLING METHODS : Air flush rotary	
							DRILLER : Norwest Holst		BOREHOLE DIAMETER : 200 mm	
							LOGGED BY : ARC		SCREEN TYPE & DIAM: HDPE 50mm	
							CHECKED BY :		SCREEN SLOT SIZE: 3 mm	
							COMMENTS			
			* 0.0	19.0				19.0		
				20.0				20.0		
				21.0				21.0		
			* 0.0	22.0				22.0		
				23.0				23.0		
				24.0				24.0		
			* 0.0	25.0				25.0		
				26.0				26.0		
				27.0				27.0		
			* 0.0	28.0				28.0		
				29.0				29.0		
			* 0.0	30.0				30.0		
				31.0				31.0		
			* 0.0	32.0				32.0		
				33.0				33.0		
				34.0				34.0		
				35.0				35.0		
				36.0				36.0		
				37.0			37.0			
					Terminated at 35.5m bgl					
							Water strike at 31.5m			
							Wet, NVO			

LOCATION / NOTES:	LEGEND	BOREHOLE LOG	
NVO = No visual or olfactory evidence of contamination	Disturbed Sample Undisturbed Sample Headspace Analysis Down Borehole Analysis Groundwater Table NVO = No visual or	Job Title: Further Soil and Groundwater Investigation Location: Whitehaven, Cumbria Client: Rhodia	
Geosock fitted			App'd: _____ Date: _____ Drawn : ARC Ref: _____ Scale: As shown Job No: 44557-033-787 Drg. Size: A4 BOREHOLE LOG

APPENDIX 3

GROUNDWATER MONITORING CERTIFICATE

GROUNDWATER MONITORING – WATER’S EDGE, WHITEHAVEN

BH	Date	Ground Water Level	Depth of well	Response Zone Interval	Monitored Material
		m bgl	m bgl	m bgl	
WS2	06/09/2019	0.5	1.12	0.5-1.2	Made Ground – Granular
	12/09/2019	0.42	1.05		
	25/09/2019	0.46	1.04		
	08/10/2019	0.23	1.04		
	24/10/2019	0.25	1.04		
	25/11/2019	0.60	1.00		
	19/12/2019	0.31	1.00		
	23/01/2020	0.46	1.00		
	20/02/2020	0.5	1.12		
WS3	06/09/2019	0.77	1.17	0.5-1.30	Made Ground – Cohesive
	12/09/2019	0.64	1.08		
	25/09/2019	0.65	1.18		
	08/10/2019	0.58	1.18		
	24/10/2019	0.61	1.18		
	25/11/2019	0.9	1.20		
	19/12/2019	0.59	1.20		
	23/01/2020	0.61	1.20		
	20/02/2020	0.6	1.20		
WS5	06/09/2019	0.51	0.97	0.5-1.00	Made Ground – Granular
	12/09/2019	0.49	0.94		
	25/09/2019	0.50	0.96		
	08/10/2019	0.39	0.90		
	24/10/2019	0.34	0.90		
	25/11/2019	0.60	0.90		
	19/12/2019	0.41	0.90		
	23/01/2020	0.48	0.90		
	20/02/2020	0.52	0.89		
WS301	10/03/2023	0.90	1.30	0.5 – 1.3	Made Ground - Granular
	05/04/2023	0.75	1.30		
WS302	10/03/2023	4.50	4.70	1.0-4.7	Natural Cohesive
	05/04/2023	4.02	4.68		
WS303	10/03/2023	Damp	5.00	1.0-5.0	Natural Cohesive
	05/04/2023	0.85	4.90		
WS304	10/03/2023	Dry	4.50	1.7-4.7	Natural Cohesive
	05/04/2023	*1			
WS305	10/03/2023	0.50	1.70	0.5-1.6	Made Ground - Cohesive
	05/04/2023	*2			
WS306	10/03/2023	Dry	1.50	0.5-1.4	Made Ground - Cohesive
	05/04/2023	0.65	1.50		
WS308	10/03/2023	Dry	0.95	0.7-1.0	Natural Granular & Natural Weathered Bedrock
	05/04/2023	Dry	0.90		
WS309	10/03/2023	Dry	0.86	0.6-0.9	Natural Cohesive & Natural Weathered Bedrock
	05/04/2023	Dry	0.80		
TP02	10/03/2023	Dry	1.50	1.0-3.0	Made Ground - Cohesive
	05/04/2023	0.65	1.50		

Notes: *1 Installation broken / damaged during ongoing siteworks.

*2 Stockpile collapse onto installation.

APPENDIX 4

CHEMICAL ANALYSIS RESULTS

APPENDIX 4.1

FWS 2019



Certificate Number 19-16626

09-Sep-19

Client FWS Consultants
1 Redwood Crescent
Office 1.8,
Peel Park
East Kilbride
South Lanarkshire
G74 5PA

Our Reference 19-16626

Client Reference 8190

Order No (not supplied)

Contract Title Waters Edge, Whitehaven

Description 20 Soil samples, 8 Leachate samples.

Date Received 28-Aug-19

Date Started 28-Aug-19

Date Completed 09-Sep-19

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



Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553776	1553777	1553778	1553779	1553780	1553781
Sample ID	WS1	WS3	S2	S3	S5	S7
Depth	0.20	0.60				
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19
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	4.9	9.6	8.3	14	9.9	13
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.0	1.5	1.0	0.7	0.9	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	0.1	0.5
Chromium	DETSC 2301#	0.15	mg/kg	7.4	8.7	9.6	15	11	27
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	11	18	17	26	22	74
Lead	DETSC 2301#	0.3	mg/kg	12	28	14	28	23	63
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.07	0.05	0.07
Nickel	DETSC 2301#	1	mg/kg	7.6	9.9	10	17	16	25
Zinc	DETSC 2301#	1	mg/kg	25	36	33	49	40	93
Inorganics									
pH	DETSC 2008#		pH	10.9	10.6	9.6	9.0	9.3	8.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	< 0.1	0.1	< 0.1	0.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	< 0.1	0.1	< 0.1	0.2
Organic matter	DETSC 2002#	0.1	%	1.2	2.5	1.4	4.0	1.7	5.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	12	11	8.6	15	5.2	9.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	190	380	110	110	76	78
Sulphate as SO4, Total	DETSC 2321#	0.01	%	1.1	1.2	0.39	0.17	0.39	0.16
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 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	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 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	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553776	1553777	1553778	1553779	1553780	1553781
Sample ID	WS1	WS3	S2	S3	S5	S7
Depth	0.20	0.60				
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	0.2	< 0.1	0.3
Pyrene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	0.3	< 0.1	0.4
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	0.6	< 0.1	0.9
Chrysene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1	0.3
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	0.2
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2	< 0.1	0.2
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
PAH Total	DETSC 3301	1.6	mg/kg	1.7	< 1.6	< 1.6	2.3	< 1.6	3.7
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553782	1553783	1553784	1553785	1553786	1553787
Sample ID	TP1	TP3	TP4	TP6	TP7	TP8
Depth	0.50	0.60	0.40	0.30	0.40	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19
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	11	4.5	9.4	26	18	18
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.3	0.5	1.2	0.4	1.3	0.6
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	19	3.3	7.4	18	17	24
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	41	11	21	84	39	30
Lead	DETSC 2301#	0.3	mg/kg	19	6.7	30	25	42	50
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	0.09	0.08
Nickel	DETSC 2301#	1	mg/kg	57	6.4	9.5	35	22	22
Zinc	DETSC 2301#	1	mg/kg	36	15	32	160	69	110
Inorganics									
pH	DETSC 2008#		pH	7.9	10.7	10.9	8.0	9.0	8.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	0.4	0.3
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	0.1	0.2
Organic matter	DETSC 2002#	0.1	%	2.3	0.4	1.6	13	5.5	4.7
Chloride Aqueous Extract	DETSC 2055	1	mg/l	7.8	7.2	4.4	9.6	17	8.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	67	84	170	100	450	140
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.10	0.32	1.3	0.59	0.44	0.19
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	85	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	1100	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	1200	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	25	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	3.3	< 0.6	< 0.6	1900	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	8.3	< 1.4	< 1.4	5000	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	12	< 10	< 10	6900	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	12	< 10	< 10	8100	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553782	1553783	1553784	1553785	1553786	1553787
Sample ID	TP1	TP3	TP4	TP6	TP7	TP8
Depth	0.50	0.60	0.40	0.30	0.40	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19	23/08/19
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	8.5	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	12	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	9.4	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	12	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	2.8	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	1.2	< 0.1	< 0.1	51	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	1.4	< 0.1	< 0.1	3.5	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	1.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	1.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	10	< 1.6	< 1.6	99	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	1.7	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553788	1556001	1556002	1557177
Sample ID	TP9	TP2	TP5	TP6
Depth	0.50	0.20	0.10	1.40
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	22/08/19	23/08/19	23/08/19
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	11	11	10	15
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.9	1.2	1.5	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	8.6	9.1	10	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	21	26	29
Lead	DETSC 2301#	0.3	mg/kg	18	21	37	18
Mercury	DETSC 2325#	0.05	mg/kg	0.07	< 0.05	0.20	< 0.05
Nickel	DETSC 2301#	1	mg/kg	9.0	12	9.8	18
Zinc	DETSC 2301#	1	mg/kg	40	37	38	46
Inorganics							
pH	DETSC 2008#		pH	9.8	10.7	9.8	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.1	0.2	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	%	1.6	2.7	2.6	2.0
Chloride Aqueous Extract	DETSC 2055	1	mg/l	8.9	12	9.0	11
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	630	470	430	120
Sulphate as SO4, Total	DETSC 2321#	0.01	%	1.6	1.1	0.90	0.08
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	8.6
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	31
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	15
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	55
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	55
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

Summary of Chemical Analysis

Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	1553788	1556001	1556002	1557177
Sample ID	TP9	TP2	TP5	TP6
Depth	0.50	0.20	0.10	1.40
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	23/08/19	22/08/19	23/08/19	23/08/19
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.3	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.4	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	3.3	< 1.6
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 19-16626
Client Ref 8190
Contract Title Waters Edge, Whitehaven
Sample Id S2

Sample Numbers 1555997 1556003 1556004
Date Analysed 09/09/2019

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETS 2084# Total Organic Carbon	%	1.4			3	5	6
DETS 2003# Loss On Ignition	%	3.3			n/a	n/a	10
DETS 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETS 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETS 3311# TPH (C10 - C40)	mg/kg	39			500	n/a	n/a
DETS 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETS 2008# pH	pH Units	10.8			n/a	>6	n/a
DETS 2073* Acid Neutralisation Capacity (pH4)	mol/kg	6.5			n/a	TBE	TBE
DETS 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETS 2306 Arsenic as As	5.5	2.5	0.011	0.029	0.5	2	25
DETS 2306 Barium as Ba	9.6	2.9	< 0.02	< 0.1	20	100	300
DETS 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETS 2306 Chromium as Cr	1.3	0.38	< 0.02	< 0.1	0.5	10	70
DETS 2306 Copper as Cu	3.9	1.9	0.008	0.021	2	50	100
DETS 2306 Mercury as Hg	0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETS 2306 Molybdenum as Mo	4	< 1.1	< 0.02	< 0.1	0.5	10	30
DETS 2306 Nickel as Ni	0.7	< 0.5	< 0.02	< 0.1	0.4	10	40
DETS 2306 Lead as Pb	1.3	0.47	< 0.01	< 0.05	0.5	10	50
DETS 2306 Antimony as Sb	1.1	0.25	< 0.01	< 0.05	0.06	0.7	5
DETS 2306 Selenium as Se	2.9	1.2	< 0.006	< 0.03	0.1	0.5	7
DETS 2306 Zinc as Zn	3.6	2.8	0.007	0.029	4	50	200
DETS 2055 Chloride as Cl	2300	1100	< 20	< 100	800	15,000	25,000
DETS 2055* Fluoride as F	250	< 100	0.5	0.3	10	150	500
DETS 2055 Sulphate as SO4	11000	3900	22	< 100	1000	20,000	50,000
DETS 2009* Total Dissolved Solids	64000	42000	128	446.5	4000	60,000	100,000
DETS 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
* Dissolved Organic Carbon	4900	2000	< 10	< 50	500	800	1000

Additional Information		
DETS 2008 pH	7.2	7.6
DETS 2009 Conductivity uS/cm	91.5	60.2
* Temperature*	18	18

Mass of Sample Kg*	0.130
Mass of dry Sample Kg*	0.116

Stage 1	
Volume of Leachant L2*	0.219
Volume of Eluate VE1*	0.14

Stage 2	
Volume of Leachant L8*	0.929
Volume of Eluate VE2*	0.91

TBE - To Be Evaluated		
SNRHW - Stable Non-Reactive		
Hazardous Waste		

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions.
Values are correct at time of issue.

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 19-16626
Client Ref 8190
Contract Title Waters Edge, Whitehaven
Sample Id S3

Sample Numbers 1555998 1556005 1556006
Date Analysed 09/09/2019

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETS 2084# Total Organic Carbon	%	3.0			3	5	6
DETS 2003# Loss On Ignition	%	3.5			n/a	n/a	10
DETS 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETS 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETS 3311# TPH (C10 - C40)	mg/kg	27			500	n/a	n/a
DETS 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETS 2008# pH	pH Units	8.6			n/a	>6	n/a
DETS 2073* Acid Neutralisation Capacity (pH4)	mol/kg	4.6			n/a	TBE	TBE
DETS 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETS 2306 Arsenic as As	1.8	1.1	0.004	0.012	0.5	2	25
DETS 2306 Barium as Ba	3.5	1.9	< 0.02	< 0.1	20	100	300
DETS 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETS 2306 Chromium as Cr	0.5	< 0.25	< 0.02	< 0.1	0.5	10	70
DETS 2306 Copper as Cu	1.5	0.8	< 0.004	< 0.02	2	50	100
DETS 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETS 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETS 2306 Nickel as Ni	< 0.5	< 0.5	< 0.02	< 0.1	0.4	10	40
DETS 2306 Lead as Pb	0.48	0.47	< 0.01	< 0.05	0.5	10	50
DETS 2306 Antimony as Sb	0.3	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETS 2306 Selenium as Se	0.86	0.35	< 0.006	< 0.03	0.1	0.5	7
DETS 2306 Zinc as Zn	2.5	2.5	0.005	0.025	4	50	200
DETS 2055 Chloride as Cl	2400	1500	< 20	< 100	800	15,000	25,000
DETS 2055* Fluoride as F	140	< 100	0.28	0.18	10	150	500
DETS 2055 Sulphate as SO4	7300	3200	< 20	< 100	1000	20,000	50,000
DETS 2009* Total Dissolved Solids	36000	25000	72	264.4	4000	60,000	100,000
DETS 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
* Dissolved Organic Carbon	3300	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETS 2008 pH	7.1	7.4
DETS 2009 Conductivity uS/cm	51.3	35.7
* Temperature*	16	18

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.122

Stage 1	
Volume of Leachant L2*	0.227
Volume of Eluate VE1*	0.16

Stage 2	
Volume of Leachant L8*	0.979
Volume of Eluate VE2*	0.91

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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 19-16626
Client Ref 8190
Contract Title Waters Edge, Whitehaven
Sample Id S5

Sample Numbers 1555999 1556007 1556008
Date Analysed 09/09/2019

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETS 2084# Total Organic Carbon	%	1.5			3	5	6
DETS 2003# Loss On Ignition	%	4.5			n/a	n/a	10
DETS 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETS 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETS 3311# TPH (C10 - C40)	mg/kg	26			500	n/a	n/a
DETS 3301 PAHs	mg/kg	3.0			100	n/a	n/a
DETS 2008# pH	pH Units	10.7			n/a	>6	n/a
DETS 2073* Acid Neutralisation Capacity (pH4)	mol/kg	5.0			n/a	TBE	TBE
DETS 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETS 2306 Arsenic as As	1.8	1.4	0.004	0.014	0.5	2	25
DETS 2306 Barium as Ba	7.1	5.7	< 0.02	< 0.1	20	100	300
DETS 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETS 2306 Chromium as Cr	0.59	< 0.25	< 0.02	< 0.1	0.5	10	70
DETS 2306 Copper as Cu	2	1.2	0.004	< 0.02	2	50	100
DETS 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETS 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETS 2306 Nickel as Ni	< 0.5	< 0.5	< 0.02	< 0.1	0.4	10	40
DETS 2306 Lead as Pb	0.32	0.36	< 0.01	< 0.05	0.5	10	50
DETS 2306 Antimony as Sb	0.57	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETS 2306 Selenium as Se	0.91	0.77	< 0.006	< 0.03	0.1	0.5	7
DETS 2306 Zinc as Zn	2.6	2.2	0.005	0.022	4	50	200
DETS 2055 Chloride as Cl	1900	1100	< 20	< 100	800	15,000	25,000
DETS 2055* Fluoride as F	320	140	0.64	1.62	10	150	500
DETS 2055 Sulphate as SO4	9500	4100	< 20	< 100	1000	20,000	50,000
DETS 2009* Total Dissolved Solids	55000	40000	110	418.7	4000	60,000	100,000
DETS 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
* Dissolved Organic Carbon	3400	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETS 2008 pH	7.1	8.3
DETS 2009 Conductivity uS/cm	79	57.5
* Temperature*	17	18

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.121

Stage 1	
Volume of Leachant L2*	0.222
Volume of Eluate VE1*	0.15

Stage 2	
Volume of Leachant L8*	0.965
Volume of Eluate VE2*	0.92

TBE - To Be Evaluated		
SNRHW - Stable Non-Reactive		
Hazardous Waste		

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions.
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WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 19-16626
Client Ref 8190
Contract Title Waters Edge, Whitehaven
Sample Id S7

Sample Numbers 1556000 1556009 1556010
Date Analysed 09/09/2019

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETC 2084# Total Organic Carbon	%	7.6			3	5	6
DETC 2003# Loss On Ignition	%	9.0			n/a	n/a	10
DETC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETC 3311# TPH (C10 - C40)	mg/kg	22			500	n/a	n/a
DETC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETC 2008# pH	pH Units	8.3			n/a	>6	n/a
DETC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	2.2			n/a	TBE	TBE
DETC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETC 2306 Arsenic as As	3.5	2.3	0.007	0.024	0.5	2	25
DETC 2306 Barium as Ba	4.2	1.5	< 0.02	< 0.1	20	100	300
DETC 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETC 2306 Chromium as Cr	1.4	0.5	< 0.02	< 0.1	0.5	10	70
DETC 2306 Copper as Cu	7.6	2.6	0.015	0.032	2	50	100
DETC 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETC 2306 Nickel as Ni	0.6	< 0.5	< 0.02	< 0.1	0.4	10	40
DETC 2306 Lead as Pb	1.3	0.66	< 0.01	< 0.05	0.5	10	50
DETC 2306 Antimony as Sb	0.94	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETC 2306 Selenium as Se	< 0.25	< 0.25	< 0.006	< 0.03	0.1	0.5	7
DETC 2306 Zinc as Zn	3.2	2.7	0.006	0.028	4	50	200
DETC 2055 Chloride as Cl	3400	1300	< 20	< 100	800	15,000	25,000
DETC 2055* Fluoride as F	560	180	1.12	2.25	10	150	500
DETC 2055 Sulphate as SO4	4900	1700	< 20	< 100	1000	20,000	50,000
DETC 2009* Total Dissolved Solids	54000	27000	108	302.1	4000	60,000	100,000
DETC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
* Dissolved Organic Carbon	4500	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETC 2008 pH	7.2	7.8
DETC 2009 Conductivity uS/cm	77.3	37.8
* Temperature*	16	18

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.108

Stage 1	
Volume of Leachant L2*	0.183
Volume of Eluate VE1*	0.128

Stage 2	
Volume of Leachant L8*	0.861
Volume of Eluate VE2*	0.79

TBE - To Be Evaluated		
SNRHW - Stable Non-Reactive		
Hazardous Waste		

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions.
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Summary of Asbestos Analysis Soil Samples

Our Ref 19-16626

Client Ref 8190

Contract Title Waters Edge, Whitehaven

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1553776	WS1 0.20	SOIL	NAD	none	Luke Donaghy
1553777	WS3 0.60	SOIL	NAD	none	Luke Donaghy
1553778	S2	SOIL	NAD	none	Luke Donaghy
1553779	S3	SOIL	NAD	none	Luke Donaghy
1553780	S5	SOIL	NAD	none	Luke Donaghy
1553781	S7	SOIL	NAD	none	Luke Donaghy
1553782	TP1 0.50	SOIL	NAD	none	Luke Donaghy
1553783	TP3 0.60	SOIL	NAD	none	Luke Donaghy
1553784	TP4 0.40	SOIL	NAD	none	Luke Donaghy
1553785	TP6 0.30	SOIL	NAD	none	Luke Donaghy
1553786	TP7 0.40	SOIL	NAD	none	Luke Donaghy
1553787	TP8 0.10	SOIL	NAD	none	Luke Donaghy
1553788	TP9 0.50	SOIL	NAD	none	Luke Donaghy
1556001	TP2 0.20	SOIL	NAD	none	Luke Donaghy
1556002	TP5 0.10	SOIL	NAD	none	Luke Donaghy
1557177	TP6 1.40	SOIL	NAD	none	Luke Donaghy

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 19-16626
 Client Ref 8190
 Contract Waters Edge, Whitehaven

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1553776	WS1 0.20 SOIL	23/08/19	GJ 250ml x2, PT 1L		
1553777	WS3 0.60 SOIL	23/08/19	GJ 250ml, PT 1L		
1553778	S2 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553779	S3 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553780	S5 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553781	S7 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553782	TP1 0.50 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553783	TP3 0.60 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553784	TP4 0.40 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553785	TP6 0.30 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1553786	TP7 0.40 SOIL	23/08/19	GJ 250ml x2, PT 1L		
1553787	TP8 0.10 SOIL	23/08/19	GJ 250ml x2, PT 1L		
1553788	TP9 0.50 SOIL	23/08/19	GJ 250ml x2, PT 1L		
1555997	S2 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1555998	S3 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1555999	S5 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556000	S7 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556001	TP2 0.20 SOIL	22/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556002	TP5 0.10 SOIL	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556003	S2 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556004	S2 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556005	S3 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556006	S3 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556007	S5 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556008	S5 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556009	S7 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1556010	S7 LEACHATE	23/08/19	GJ 250ml, GJ 60ml, PT 1L		
1557177	TP6 1.40 SOIL	23/08/19	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

APPENDIX 4.2

FWS 2020



Certificate of Analysis

Certificate Number 20-01932

05-Feb-20

Client FWS Consultants
1 Redwood Crescent
Office 1.8,
Peel Park
East Kilbride
South Lanarkshire
G74 5PA

Our Reference 20-01932

Client Reference 8190.3

Order No 202/3190

Contract Title Water's Edge, Whitehaven

Description 24 Soil samples, 8 Leachate samples.

Date Received 30-Jan-20

Date Started 30-Jan-20

Date Completed 05-Feb-20

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

Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631114	1631115	1631116	1631117	1631118	1631119
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106
Depth	0.40	0.30	0.10	0.60		0.40
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020
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	9.2	7.6	11	15	16	17
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.1	1.2	1.1	1.2	1.2	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.2	0.2	0.1	0.1	0.2
Chromium	DETSC 2301#	0.15	mg/kg	12	8.2	12	17	18	21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	29	19	25	28	29	33
Lead	DETSC 2301#	0.3	mg/kg	24	17	22	26	29	36
Mercury	DETSC 2325#	0.05	mg/kg	0.13	< 0.05	< 0.05	< 0.05	< 0.05	0.08
Nickel	DETSC 2301#	1	mg/kg	12	9.5	13	18	20	22
Zinc	DETSC 2301#	1	mg/kg	51	37	52	40	42	57
Inorganics									
pH	DETSC 2008#		pH	8.2	8.5	8.3	7.6	7.6	7.7
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.2	0.2	0.6	0.7	0.6
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.3	0.9	2.0	1.8	2.1	2.2
Chloride Aqueous Extract	DETSC 2055	1	mg/l	5.5	5.2	5.3	9.2	9.9	11
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1500	1500	1500	1200	1200	1500
Sulphate as SO4, Total	DETSC 2321#	0.01	%	11	12	10	0.47	0.55	1.0
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	0.04	0.03	0.02	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.04	0.04	0.08	< 0.01	0.11	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	6.7	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	4.4	< 1.2	< 1.2	< 1.2	< 1.2	10
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	2.0	< 1.5	< 1.5	< 1.5	< 1.5	26
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	93
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	13	< 10	< 10	< 10	< 10	130
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	0.35	0.04	< 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	< 0.9	3.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	30	< 0.5	< 0.5	< 0.5	16	1600
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	64	5.3	< 0.6	< 0.6	7.0	760
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	18	17	< 1.4	< 1.4	< 1.4	220
Aromatic C5-C35	DETSC 3072*	10	mg/kg	110	22	< 10	< 10	23	2600
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	130	22	< 10	< 10	23	2700
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631114	1631115	1631116	1631117	1631118	1631119
Sample ID	TP101	TP102	TP103	TP104	TP105	TP106
Depth	0.40	0.30	0.10	0.60		0.40
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020	20/01/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	0.3	0.2	< 0.1	< 0.1	< 0.1	1.2
Acenaphthylene	DETSC 3301	0.1	mg/kg	11	0.2	0.3	< 0.1	0.1	53
Acenaphthene	DETSC 3301	0.1	mg/kg	2.3	0.2	0.1	< 0.1	< 0.1	14
Fluorene	DETSC 3301	0.1	mg/kg	5.5	0.4	0.6	< 0.1	< 0.1	6.9
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	1.1	3.5	0.3	0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.6	1.3	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	6.6	10	0.5	0.2	4.2
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	7.2	8.6	0.4	< 0.1	0.8
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	3.6	4.2	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	4.2	4.2	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	4.8	3.5	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	2.5	1.9	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	5.6	3.9	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	3.4	1.9	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	0.3	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	3.8	2.2	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	19	45	47	< 1.6	< 1.6	81
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	5.6	5.9	5.6

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631120	1631121	1631122	1631123	1631124	1631125
Sample ID	TP106	TP109	TP112	TP117	TP118	TP120
Depth	2.00	0.20	0.30	0.30	0.30	0.30
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2020	21/01/2020	21/01/2020	22/01/2020	22/01/2020	22/01/2020
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	14	11	11	5.6	9.9	13
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.7	0.7	0.7	1.9	1.9	1.9
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.1	0.1	0.3	< 0.1	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	20	16	16	14	6.3	6.5
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	31	24	28	34	13	14
Lead	DETSC 2301#	0.3	mg/kg	23	15	18	62	24	21
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.08	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	22	18	21	12	7.2	7.5
Zinc	DETSC 2301#	1	mg/kg	57	31	39	130	17	19
Inorganics									
pH	DETSC 2008#		pH	10.3	10.1	9.9	11.0	11.0	10.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.9	0.6	0.5
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.7	1.5	1.7	1.6	2.0	1.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	16	17	16	9.9	14	14
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	450	420	450	400	400	390
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.39	0.61	0.88	1.2	1.1	1.2
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	0.12	0.04	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.29	0.52	< 0.01	< 0.01	0.09
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 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	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 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	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	0.02	0.04	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	0.04	0.07	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	0.03	0.43	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	9.0	< 0.5	6.4	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	4.5	< 0.6	2.4	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	14	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	14	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	0.02	0.04	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631120	1631121	1631122	1631123	1631124	1631125
Sample ID	TP106	TP109	TP112	TP117	TP118	TP120
Depth	2.00	0.20	0.30	0.30	0.30	0.30
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	20/01/2020	21/01/2020	21/01/2020	22/01/2020	22/01/2020	22/01/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	0.04	0.07	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	0.03	0.25	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	5.2	0.4	0.3	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	2.8	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	0.2	0.2	0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	0.3	< 0.1	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	8.3	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631126	1631127	1631128	1631684	1631685	1631686
Sample ID	TP124	TP125	TP126	TP101 WAC1 Stockpile	TP103 WAC1 Stockpile	TP106 WAC1 Stockpile
Depth	0.30	0.30	0.70			
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/01/2020	22/01/2020	22/01/2020	20/01/2020	20/01/2020	20/01/2020
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	13	17	13	8.7	11	11
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.8	1.8	1.8	1.3	0.5	0.9
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.5	0.1	< 0.1	0.2	0.1
Chromium	DETSC 2301#	0.15	mg/kg	6.5	24	11	12	21	18
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	11	360	22	19	28	27
Lead	DETSC 2301#	0.3	mg/kg	21	200	37	15	19	17
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.16	< 0.05	< 0.05	0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	7.4	34	13	17	31	23
Zinc	DETSC 2301#	1	mg/kg	20	270	34	37	56	47
Inorganics									
pH	DETSC 2008#		pH	8.9	8.9	8.7	9.9	7.7	8.3
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.1	0.1	0.1	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.7	2.5	2.5	1.9	3.9	1.5
Chloride Aqueous Extract	DETSC 2055	1	mg/l	13	11	12	8.9	8.1	6.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	570	590	610	730	410	1500
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.37	0.37	0.47	0.57	0.15	0.53
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	0.04	0.05	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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 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	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	0.19	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 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	< 0.5	15
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	21
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	36
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	36
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	0.08	< 0.01	< 0.01	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631126	1631127	1631128	1631684	1631685	1631686
Sample ID	TP124	TP125	TP126	TP101 WAC1 Stockpile	TP103 WAC1 Stockpile	TP106 WAC1 Stockpile
Depth	0.30	0.30	0.70			
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	22/01/2020	22/01/2020	22/01/2020	20/01/2020	20/01/2020	20/01/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	0.09	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	0.1	0.2
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.3	0.5	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631687	1631688	1631689	1631690	1631718	1631785
Sample ID	TP107 WAC1 Stockpile	TP109 WAC1 Stockpile	TP112 WAC1 Stockpile	TP113 WAC1 Stockpile	TP104 WAC1	TP115 WAC1
Depth						
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/01/2020	21/01/2020	21/01/2020	21/01/2020	20/01/2020	21/01/2020
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	9.7	7.4	11	14	14	13
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.4	1.0	1.2	1.4	1.6	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.1	0.1	0.2	0.1	0.2
Chromium	DETSC 2301#	0.15	mg/kg	13	9.1	13	15	18	17
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	22	23	25	26	30	33
Lead	DETSC 2301#	0.3	mg/kg	18	12	20	19	24	110
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.06	0.06	0.05
Nickel	DETSC 2301#	1	mg/kg	15	12	16	16	29	21
Zinc	DETSC 2301#	1	mg/kg	42	25	45	39	58	90
Inorganics									
pH	DETSC 2008#		pH	10.3	10.2	9.8	9.8	9.7	9.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.1	0.1	0.1	0.1	1.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.1	2.3	1.7	1.9	2.2	3.9
Chloride Aqueous Extract	DETSC 2055	1	mg/l	15	15	9.5	14	7.5	8.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	310	320	310	340	700	120
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.49	0.24	0.43	0.32	0.72	0.38
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 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	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 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	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	1631687	1631688	1631689	1631690	1631718	1631785
Sample ID	TP107 WAC1 Stockpile	TP109 WAC1 Stockpile	TP112 WAC1 Stockpile	TP113 WAC1 Stockpile	TP104 WAC1	TP115 WAC1
Depth						
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	21/01/2020	21/01/2020	21/01/2020	21/01/2020	20/01/2020	21/01/2020
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	0.5	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.2	0.1	0.1	0.5	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.4	0.2	0.4	0.5	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.4	0.3	0.4	0.5	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Sample Id TP106 WAC1 Stockpile

Sample Numbers 1631686 1631691 1631692

Date Analysed 05/02/2020

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	1.6			3	5	6
DETSC 2003# Loss On Ignition	%	4.4			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETSC 2008# pH	pH Units	8.3			n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1			n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.81	0.35	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	28	11	0.06	0.14	20	100	300
DETSC 2306 Cadmium as Cd	0.15	0.042	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.32	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	3.9	1.2	0.008	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	6.3	1.2	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.17	< 0.09	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.3	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	2.9	2.8	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	13	2.5	0.026	0.042	4	50	200
DETSC 2055 Chloride as Cl	4500	1300	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	520	140	1.04	2	10	150	500
DETSC 2055 Sulphate as SO4	910000	120000	1820	2451.2	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	1000000	200000	2000	3267	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	4300	< 2000	< 10	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	8.4	8.4
DETSC 2009 Conductivity uS/cm	1490.0	283.0
* Temperature*	15.0	15.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.115

Stage 1

Volume of Leachant L2*	0.205
Volume of Eluate VE1*	0.182

Stage 2

Volume of Leachant L8*	0.919
Volume of Eluate VE2*	0.901

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Sample Id TP107 WAC1 Stockpile

Sample Numbers 1631687 1631693 1631694

Date Analysed 05/02/2020

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste		
DETSC 2084# Total Organic Carbon	%	2.5	3	5	6		
DETSC 2003# Loss On Ignition	%	5.4	n/a	n/a	10		
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a		
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a		
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a		
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a		
DETSC 2008# pH	pH Units	10.3	n/a	>6	n/a		
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1	n/a	TBE	TBE		
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1	n/a	TBE	TBE		

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	0.51	0.51	< 0.002	< 0.01	0.5	2	25
DETSC 2306 Barium as Ba	14	7.2	0.03	< 0.1	20	100	300
DETSC 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.46	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	1.8	0.74	< 0.004	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	4.9	0.9	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	< 0.09	< 0.09	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.34	< 0.17	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.66	7	< 0.006	0.06	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	6700	1700	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	310	100	0.62	1.32	10	150	500
DETSC 2055 Sulphate as SO4	88000	14000	176	253.9	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	200000	68000	400	883.2	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	5200	< 2000	10.4	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	8.2	8.5
DETSC 2009 Conductivity uS/cm	282.0	96.4
* Temperature*	15.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.117

Stage 1

Volume of Leachant L2*	0.211
Volume of Eluate VE1*	0.18

Stage 2

Volume of Leachant L8*	0.936
Volume of Eluate VE2*	0.905

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Sample Id TP109 WAC1 Stockpile

Sample Numbers 1631688 1631695 1631696

Date Analysed 05/02/2020

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result	Inert Waste	SNRHW	Hazardous Waste		
DETSC 2084# Total Organic Carbon	%	3.3	3	5	6		
DETSC 2003# Loss On Ignition	%	5.0	n/a	n/a	10		
DETSC 3321# BTEX	mg/kg	< 0.04	6	n/a	n/a		
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01	1	n/a	n/a		
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10	500	n/a	n/a		
DETSC 3301 PAHs	mg/kg	< 1.6	100	n/a	n/a		
DETSC 2008# pH	pH Units	10.2	n/a	>6	n/a		
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1	n/a	TBE	TBE		
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1	n/a	TBE	TBE		

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	2.8	1.5	0.006	0.017	0.5	2	25
DETSC 2306 Barium as Ba	20	13	0.04	0.14	20	100	300
DETSC 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.87	< 0.25	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	5.3	1.7	0.011	0.022	2	50	100
DETSC 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.2	< 0.5	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	1.4	0.2	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	0.89	1.4	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	1.7	1.4	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	1.5	< 1.3	0.003	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	4400	1100	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	340	120	0.68	1.53	10	150	500
DETSC 2055 Sulphate as SO4	28000	32000	56	314.1	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	100000	91000	200	923.3	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	6000	2300	12	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	6.9	6.6
DETSC 2009 Conductivity uS/cm	146.0	131.0
* Temperature*	14.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.115

Stage 1

Volume of Leachant L2*	0.205
Volume of Eluate VE1*	0.17

Stage 2

Volume of Leachant L8*	0.92
Volume of Eluate VE2*	0.88

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

WASTE ACCEPTANCE CRITERIA TESTING ANALYTICAL REPORT

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Sample Id TP115 WAC1

Sample Numbers 1631785 1631697 1631698

Date Analysed 05/02/2020

Test Results On Waste					WAC Limit Values		
Determinand and Method Reference	Units	Result			Inert Waste	SNRHW	Hazardous Waste
DETSC 2084# Total Organic Carbon	%	5.2			3	5	6
DETSC 2003# Loss On Ignition	%	4.7			n/a	n/a	10
DETSC 3321# BTEX	mg/kg	< 0.04			6	n/a	n/a
DETSC 3401# PCBs (7 congeners)	mg/kg	< 0.01			1	n/a	n/a
DETSC 3311# TPH (C10 - C40)	mg/kg	< 10			500	n/a	n/a
DETSC 3301 PAHs	mg/kg	< 1.6			100	n/a	n/a
DETSC 2008# pH	pH Units	9.5			n/a	>6	n/a
DETSC 2073* Acid Neutralisation Capacity (pH4)	mol/kg	< 1			n/a	TBE	TBE
DETSC 2073* Acid Neutralisation Capacity (pH7)	mol/kg	< 1			n/a	TBE	TBE

Test Results On Leachate					WAC Limit Values		
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached* mg/kg		Limit values for LS10 Leachate		
	2:1	8:1	LS2	LS10	Inert Waste	SNRHW	Hazardous Waste
DETSC 2306 Arsenic as As	2.6	1.5	0.005	0.017	0.5	2	25
DETSC 2306 Barium as Ba	21	10	0.04	0.12	20	100	300
DETSC 2306 Cadmium as Cd	< 0.03	< 0.03	< 0.004	< 0.02	0.04	1	5
DETSC 2306 Chromium as Cr	0.81	0.36	< 0.02	< 0.1	0.5	10	70
DETSC 2306 Copper as Cu	4.8	1.4	0.01	< 0.02	2	50	100
DETSC 2306 Mercury as Hg	< 0.01	< 0.01	< 0.0004	< 0.002	0.01	0.2	2
DETSC 2306 Molybdenum as Mo	< 1.1	< 1.1	< 0.02	< 0.1	0.5	10	30
DETSC 2306 Nickel as Ni	1.7	< 0.5	< 0.02	< 0.1	0.4	10	40
DETSC 2306 Lead as Pb	0.9	0.27	< 0.01	< 0.05	0.5	10	50
DETSC 2306 Antimony as Sb	1.2	0.41	< 0.01	< 0.05	0.06	0.7	5
DETSC 2306 Selenium as Se	0.94	0.6	< 0.006	< 0.03	0.1	0.5	7
DETSC 2306 Zinc as Zn	< 1.3	< 1.3	< 0.002	< 0.01	4	50	200
DETSC 2055 Chloride as Cl	4800	1900	< 20	< 100	800	15,000	25,000
DETSC 2055* Fluoride as F	420	< 100	0.84	0.67	10	150	500
DETSC 2055 Sulphate as SO4	27000	20000	54	211.2	1000	20,000	50,000
DETSC 2009* Total Dissolved Solids	100000	73000	200	773.1	4000	60,000	100,000
DETSC 2130 Phenol Index	< 100	< 100	< 0.2	< 1	1	n/a	n/a
DETSC 2085 Dissolved Organic Carbon	6300	< 2000	12.6	< 50	500	800	1000

Additional Information		
DETSC 2008 pH	7.0	8.3
DETSC 2009 Conductivity uS/cm	144.0	104.0
* Temperature*	14.0	17.0

Mass of Sample Kg*	0.140
Mass of dry Sample Kg*	0.117

Stage 1

Volume of Leachant L2*	0.21
Volume of Eluate VE1*	0.186

Stage 2

Volume of Leachant L8*	0.933
Volume of Eluate VE2*	0.9

TBE - To Be Evaluated
SNRHW - Stable Non-Reactive
Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

* DETS are accredited for the testing of leachates and not the leachate preparation stage which is unaccredited.

Summary of Asbestos Analysis

Soil Samples

Our Ref 20-01932

Client Ref 8190.3

Contract Title Water's Edge, Whitehaven

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1631114	TP101 0.40	SOIL	Chrysotile	Bundles of Chrysotile present	Jordan Eadington
1631115	TP102 0.30	SOIL	NAD	none	Jordan Eadington
1631116	TP103 0.10	SOIL	NAD	none	Jordan Eadington
1631117	TP104 0.60	SOIL	Amosite	Small bundle of Amosite fibres present	Jordan Eadington
1631118	TP105	SOIL	NAD	none	Jordan Eadington
1631119	TP106 0.40	SOIL	NAD	none	Jordan Eadington
1631121	TP109 0.20	SOIL	NAD	none	Jordan Eadington
1631122	TP112 0.30	SOIL	NAD	none	Jordan Eadington
1631123	TP117 0.30	SOIL	NAD	none	Jordan Eadington
1631124	TP118 0.30	SOIL	NAD	none	Jordan Eadington
1631125	TP120 0.30	SOIL	NAD	none	Jordan Eadington
1631126	TP124 0.30	SOIL	NAD	none	Jordan Eadington
1631127	TP125 0.30	SOIL	NAD	none	Jordan Eadington
1631128	TP126 0.70	SOIL	NAD	none	Jordan Eadington
1631684	TP101 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631685	TP103 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631686	TP106 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631687	TP107 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631688	TP109 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631689	TP112 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631690	TP113 WAC1 Stockpile	SOIL	NAD	none	D Wilkinson
1631718	TP104 WAC1	SOIL	NAD	none	D Wilkinson
1631785	TP115 WAC1	SOIL	NAD	none	D Wilkinson

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 20-01932
 Client Ref 8190.3
 Contract Water's Edge, Whitehaven

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1631114	TP101 0.40 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631115	TP102 0.30 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631116	TP103 0.10 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631117	TP104 0.60 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631118	TP105 SOIL	20/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631119	TP106 0.40 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631120	TP106 2.00 SOIL	20/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631121	TP109 0.20 SOIL	21/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631122	TP112 0.30 SOIL	21/01/20	GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1631123	TP117 0.30 SOIL	22/01/20	GJ 250ml x2, P(other)	pH + Conductivity (7 days)	
1631124	TP118 0.30 SOIL	22/01/20	GJ 250ml x2, P(other)	pH + Conductivity (7 days)	
1631125	TP120 0.30 SOIL	22/01/20	GJ 250ml x2, P(other)	pH + Conductivity (7 days)	
1631126	TP124 0.30 SOIL	22/01/20	GJ 250ml x2, PT 1L	pH + Conductivity (7 days)	
1631127	TP125 0.30 SOIL	22/01/20	GJ 250ml x2, PT 1L	pH + Conductivity (7 days)	
1631128	TP126 0.70 SOIL	22/01/20	P(other) x2	pH + Conductivity (7 days)	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
1631684	TP101 WAC1 Stockpile SOIL	20/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631685	TP103 WAC1 Stockpile SOIL	20/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631686	TP106 WAC1 Stockpile SOIL	20/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631687	TP107 WAC1 Stockpile SOIL	21/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631688	TP109 WAC1 Stockpile SOIL	21/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631689	TP112 WAC1 Stockpile SOIL	21/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631690	TP113 WAC1 Stockpile SOIL	21/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631691	TP106 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631692	TP106 WAC1 Stockpile LEACHATE	20/01/20	GJ 250ml x2, PT 1L x2		
1631693	TP107 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631694	TP107 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631695	TP109 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631696	TP109 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631697	TP115 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631698	TP115 WAC1 Stockpile LEACHATE	21/01/20	GJ 250ml x2, PT 1L x2		
1631718	TP104 WAC1 SOIL	20/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	
1631785	TP115 WAC1 SOIL	21/01/20	GJ 250ml x2, PT 1L x2	pH + Conductivity (7 days)	

Information in Support of the Analytical Results

Our Ref 20-01932

Client Ref 8190.3

Contract Water's Edge, Whitehaven

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

APPENDIX 4.3

FWS 2022



Certificate of Analysis

Certificate Number 22-21408

Issued: 31-Oct-22

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

Our Reference 22-21408

Client Reference 8190

Order No 2022/5638

Contract Title Waters Edge

Description 20 Soil samples.

Date Received 24-Oct-22

Date Started 24-Oct-22

Date Completed 31-Oct-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

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood
General Manager



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Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075490	2075491	2075492	2075493	2075494	2075495
Sample ID	TP201 (Stockpile)	TP202 (Stockpile)	TP202 (Stockpile)	TP203 (Stockpile)	TP203 (Stockpile)	TP204 (Stockpile)
Depth	1.80	1.00	1.50	0.50	1.40	1.70
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
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	14	9.5	14	13	18	13
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	0.8	0.8	0.9	1.2	1.1
Cadmium	DETSC 2301#	0.1	mg/kg	17	0.3	9.5	0.1	4.1	0.2
Chromium	DETSC 2301#	0.15	mg/kg	41	37	28	23	25	18
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	70	28	53	30	41	31
Lead	DETSC 2301#	0.3	mg/kg	110	17	78	56	54	21
Mercury	DETSC 2325#	0.05	mg/kg	0.57	0.05	0.34	0.06	0.20	0.06
Nickel	DETSC 2301#	1	mg/kg	29	22	23	20	23	23
Selenium	DETSC 2301#	0.5	mg/kg	1.6	1.8	1.8	1.8	2.9	1.7
Zinc	DETSC 2301#	1	mg/kg	840	62	550	51	240	52
Inorganics									
pH	DETSC 2008#		pH	11.3	8.1	10.9	8.0	9.5	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.2	0.5	0.2	0.1	0.2	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	2.1	1.1	1.6	1.4	1.7	1.3
Chloride Aqueous Extract	DETSC 2055	1	mg/l	9100	15	2200	14	1200	8.9
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	400	1800	390	600	250	280
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	7640	18300	5250	2690	2430	1210
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 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	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 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	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075490	2075491	2075492	2075493	2075494	2075495
Sample ID	TP201 (Stockpile)	TP202 (Stockpile)	TP202 (Stockpile)	TP203 (Stockpile)	TP203 (Stockpile)	TP204 (Stockpile)
Depth	1.80	1.00	1.50	0.50	1.40	1.70
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	0.1	< 0.1	0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	0.2	0.3	0.4	0.2
Pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	0.3	0.3	0.3	0.2
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH 16 Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	1.2	< 0.3	0.8	< 0.3	0.9	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075496	2075497	2075498	2075499	2075500	2075501
Sample ID	TP205 (Stockpile)	TP206 (Stockpile)	TP207 (Stockpile)	TP208 (Stockpile)	TT-A1 (hotspot)	TT-A1 (hotspot)
Depth	1.10	2.00	1.20	1.50	0.40	0.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
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	19	11	27	14		
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.5	1.1	1.1	1.1		
Cadmium	DETSC 2301#	0.1	mg/kg	4.2	0.1	2.1	0.1		
Chromium	DETSC 2301#	0.15	mg/kg	25	13	21	15		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0		
Copper	DETSC 2301#	0.2	mg/kg	89	22	46	25		
Lead	DETSC 2301#	0.3	mg/kg	67	22	45	23		
Mercury	DETSC 2325#	0.05	mg/kg	0.20	< 0.05	0.13	< 0.05		
Nickel	DETSC 2301#	1	mg/kg	32	13	25	13		
Selenium	DETSC 2301#	0.5	mg/kg	2.5	1.7	2.1	0.9		
Zinc	DETSC 2301#	1	mg/kg	360	38	150	42		
Inorganics									
pH	DETSC 2008#		pH	9.6	10.4	9.1	9.4		
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.3	< 0.1	< 0.1		
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1		
Organic matter	DETSC 2002#	0.1	%	2.3	1.0	2.3	1.5		
Chloride Aqueous Extract	DETSC 2055	1	mg/l	1600	12	650	12		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	420	320	160	91		
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	4460	5030	2480	1510		
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	5.0	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	7.3	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	12	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	470	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	450	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	42	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	960	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	970	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075496	2075497	2075498	2075499	2075500	2075501
Sample ID	TP205 (Stockpile)	TP206 (Stockpile)	TP207 (Stockpile)	TP208 (Stockpile)	TT-A1 (hotspot)	TT-A1 (hotspot)
Depth	1.10	2.00	1.20	1.50	0.40	0.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	0.5	< 0.1	< 0.1	< 0.1		
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1		
Acenaphthene	DETSC 3301	0.1	mg/kg	0.8	0.2	0.1	0.2		
Fluorene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1		
Phenanthrene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	0.1	< 0.1		
Anthracene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1		
Fluoranthene	DETSC 3301	0.1	mg/kg	1.1	0.2	0.5	0.2		
Pyrene	DETSC 3301	0.1	mg/kg	1.0	0.3	0.3	0.2		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1		
Chrysene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.8	< 0.1	< 0.1	< 0.1		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.9	< 0.1	< 0.1	< 0.1		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	0.7	< 0.1	< 0.1	< 0.1		
PAH 16 Total	DETSC 3301	1.6	mg/kg	9.0	< 1.6	< 1.6	< 1.6		
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	0.6	< 0.3	< 0.3		

Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075502	2075503	2075504	2075505	2075506	2075507
Sample ID	TT-A1 (hotspot)	TT-A2 (hotspot)	TT-B (hotspot)	TT-C1 (hotspot)	TT-C1 (hotspot)	TT-C2 (hotspot)
Depth	1.20	0.70	0.80	0.90	1.20	0.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	12/10/2022	12/10/2022	12/10/2022
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						
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg						
Cadmium	DETSC 2301#	0.1	mg/kg						
Chromium	DETSC 2301#	0.15	mg/kg						
Chromium, Hexavalent	DETSC 2204*	1	mg/kg						
Copper	DETSC 2301#	0.2	mg/kg						
Lead	DETSC 2301#	0.3	mg/kg						
Mercury	DETSC 2325#	0.05	mg/kg						
Nickel	DETSC 2301#	1	mg/kg						
Selenium	DETSC 2301#	0.5	mg/kg						
Zinc	DETSC 2301#	1	mg/kg						
Inorganics									
pH	DETSC 2008#		pH						
Cyanide, Total	DETSC 2130#	0.1	mg/kg						
Cyanide, Free	DETSC 2130#	0.1	mg/kg						
Organic matter	DETSC 2002#	0.1	%						
Chloride Aqueous Extract	DETSC 2055	1	mg/l						
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l						
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg						
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.06	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	0.15	< 0.01	0.34
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	7.7	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	5.8	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	6.7	< 3.4	< 3.4	18	< 3.4	47
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	31	< 10	47
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 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	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	370	< 0.5	< 0.5	330	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	100	< 0.6	< 0.6	83	< 0.6	6.2
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	44	< 1.4	< 1.4	100	< 1.4	190
Aromatic C5-C35	DETSC 3072*	10	mg/kg	520	< 10	< 10	510	< 10	190
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	520	< 10	< 10	550	< 10	240
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075502	2075503	2075504	2075505	2075506	2075507
Sample ID	TT-A1 (hotspot)	TT-A2 (hotspot)	TT-B (hotspot)	TT-C1 (hotspot)	TT-C1 (hotspot)	TT-C2 (hotspot)
Depth	1.20	0.70	0.80	0.90	1.20	0.80
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	11/10/2022	11/10/2022	11/10/2022	12/10/2022	12/10/2022	12/10/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg						
Acenaphthylene	DETSC 3301	0.1	mg/kg						
Acenaphthene	DETSC 3301	0.1	mg/kg						
Fluorene	DETSC 3301	0.1	mg/kg						
Phenanthrene	DETSC 3301	0.1	mg/kg						
Anthracene	DETSC 3301	0.1	mg/kg						
Fluoranthene	DETSC 3301	0.1	mg/kg						
Pyrene	DETSC 3301	0.1	mg/kg						
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg						
Chrysene	DETSC 3301	0.1	mg/kg						
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg						
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg						
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg						
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg						
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg						
PAH 16 Total	DETSC 3301	1.6	mg/kg						
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg						

Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075508	2075509
.Sample ID	TT-C2 (hotspot)	TT-D (hotspot)
Depth	1.20	1.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	12/10/2022	12/10/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg		
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg		
Cadmium	DETSC 2301#	0.1	mg/kg		
Chromium	DETSC 2301#	0.15	mg/kg		
Chromium, Hexavalent	DETSC 2204*	1	mg/kg		
Copper	DETSC 2301#	0.2	mg/kg		
Lead	DETSC 2301#	0.3	mg/kg		
Mercury	DETSC 2325#	0.05	mg/kg		
Nickel	DETSC 2301#	1	mg/kg		
Selenium	DETSC 2301#	0.5	mg/kg		
Zinc	DETSC 2301#	1	mg/kg		
Inorganics					
pH	DETSC 2008#		pH		
Cyanide, Total	DETSC 2130#	0.1	mg/kg		
Cyanide, Free	DETSC 2130#	0.1	mg/kg		
Organic matter	DETSC 2002#	0.1	%		
Chloride Aqueous Extract	DETSC 2055	1	mg/l		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l		
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg		
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	1.9	< 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

Summary of Chemical Analysis

Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	2075508	2075509
Sample ID	TT-C2 (hotspot)	TT-D (hotspot)
Depth	1.20	1.00
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	12/10/2022	12/10/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg		
Acenaphthylene	DETSC 3301	0.1	mg/kg		
Acenaphthene	DETSC 3301	0.1	mg/kg		
Fluorene	DETSC 3301	0.1	mg/kg		
Phenanthrene	DETSC 3301	0.1	mg/kg		
Anthracene	DETSC 3301	0.1	mg/kg		
Fluoranthene	DETSC 3301	0.1	mg/kg		
Pyrene	DETSC 3301	0.1	mg/kg		
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg		
Chrysene	DETSC 3301	0.1	mg/kg		
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg		
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg		
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg		
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg		
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg		
PAH 16 Total	DETSC 3301	1.6	mg/kg		
Phenols					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg		

Summary of Asbestos Analysis Soil Samples

Our Ref 22-21408

Client Ref 8190

Contract Title Waters Edge

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2075490	TP201 (Stockpile) 1.80	SOIL	NAD	none	Pierce Booth
2075491	TP202 (Stockpile) 1.00	SOIL	NAD	none	Pierce Booth
2075492	TP202 (Stockpile) 1.50	SOIL	NAD	none	Pierce Booth
2075493	TP203 (Stockpile) 0.50	SOIL	NAD	none	Pierce Booth
2075494	TP203 (Stockpile) 1.40	SOIL	NAD	none	Pierce Booth
2075495	TP204 (Stockpile) 1.70	SOIL	NAD	none	Pierce Booth
2075496	TP205 (Stockpile) 1.10	SOIL	NAD	none	Pierce Booth
2075497	TP206 (Stockpile) 2.00	SOIL	NAD	none	Pierce Booth
2075498	TP207 (Stockpile) 1.20	SOIL	NAD	none	Pierce Booth
2075499	TP208 (Stockpile) 1.50	SOIL	NAD	none	Pierce Booth

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 22-21408
Client Ref 8190
Contract Waters Edge

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2075490	TP201 (Stockpile) 1.80 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075491	TP202 (Stockpile) 1.00 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075492	TP202 (Stockpile) 1.50 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075493	TP203 (Stockpile) 0.50 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075494	TP203 (Stockpile) 1.40 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075495	TP204 (Stockpile) 1.70 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075496	TP205 (Stockpile) 1.10 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075497	TP206 (Stockpile) 2.00 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075498	TP207 (Stockpile) 1.20 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075499	TP208 (Stockpile) 1.50 SOIL	11/10/22	GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2075500	TT-A1 (hotspot) 0.40 SOIL	11/10/22	GJ 250ml, PT 1L		
2075501	TT-A1 (hotspot) 0.80 SOIL	11/10/22	GJ 250ml, PT 1L		
2075502	TT-A1 (hotspot) 1.20 SOIL	11/10/22	GJ 250ml, PT 1L		
2075503	TT-A2 (hotspot) 0.70 SOIL	11/10/22	GJ 250ml, PT 1L		
2075504	TT-B (hotspot) 0.80 SOIL	11/10/22	GJ 250ml, PT 1L		
2075505	TT-C1 (hotpost) 0.90 SOIL	12/10/22	GJ 250ml, PT 1L		
2075506	TT-C1 (hotpost) 1.20 SOIL	12/10/22	GJ 250ml, PT 1L		
2075507	TT-C2 (hotspot) 0.80 SOIL	12/10/22	GJ 250ml, PT 1L		
2075508	TT-C2 (hotspot) 1.20 SOIL	12/10/22	GJ 250ml, PT 1L		
2075509	TT-D (hotspot) 1.00 SOIL	12/10/22	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



DETS

Certificate of Analysis

Certificate Number 22-22081

Issued: 03-Nov-22

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

Our Reference 22-22081

Client Reference 8190

Order No 2022/5638

Contract Title Waters Edge

Description One Soil sample.

Date Received 24-Oct-22

Date Started 31-Oct-22

Date Completed 03-Nov-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 22-22081

Client Ref 8190

Contract Title Waters Edge

Lab No	2078979
Sample ID	TP201 (Stockpile)
Depth	1.80
Other ID	
Sample Type	SOIL
Sampling Date	11/10/2022
Sampling Time	n/s

Test	Method	LOD	Units
Metals			
Cadmium	DETSC 2301#	0.1	mg/kg
			0.2

Information in Support of the Analytical Results

Our Ref 22-22081
Client Ref 8190
Contract Waters Edge

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
2078979	TP201 (Stockpile) 1.80 SOIL	11/10/22	No containers logged		Cannot evaluate

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 22-22095

Issued: 07-Nov-22

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

Our Reference 22-22095

Client Reference 8190

Order No 2022/5638

Contract Title Waters Edge

Description One Soil sample.

Date Received 24-Oct-22

Date Started 01-Nov-22

Date Completed 07-Nov-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 22-22095

Client Ref 8190

Contract Title Waters Edge

Lab No	2079132
Sample ID	TP205 (Stockpile)
Depth	1.10
Other ID	
Sample Type	SOIL
Sampling Date	11/10/2022
Sampling Time	n/s

Test	Method	LOD	Units	
PAHs				
Naphthalene	DETSC 3303#	0.03	mg/kg	0.11
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	0.05
Fluorene	DETSC 3303	0.03	mg/kg	0.08
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.27
Anthracene	DETSC 3303	0.03	mg/kg	0.08
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.45
Pyrene	DETSC 3303#	0.03	mg/kg	0.36
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.12
Chrysene	DETSC 3303	0.03	mg/kg	0.17
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.23
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.08
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.20
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.09
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.11
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	2.4

Information in Support of the Analytical Results

Our Ref 22-22095
 Client Ref 8190
 Contract Waters Edge

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2079132	TP205 (Stockpile) 1.10 SOIL	11/10/22	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

APPENDIX 4.4

FWS 2023



Certificate of Analysis

Certificate Number 23-06596

Issued: 05-Apr-23

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

Our Reference 23-06596

Client Reference 8190

Order No 2023/5979

Contract Title Water's Edge, Whitehaven

Description 10 Soil samples, 22 Leachate samples.

Date Received 20-Mar-23

Date Started 20-Mar-23

Date Completed 05-Apr-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



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Summary of Chemical Analysis

Soil Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143131	2143133	2143136	2143139	2143144	2143146
Sample ID	WS301	WS302	WS303	WS304	WS306	TP02
Depth	0.90	0.70	1.50	1.30	1.20	1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	08/03/2023	09/03/2023	10/03/2023	08/03/2023	08/03/2023	10/03/2023
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	29	5.9	8.5	14	23	12
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.1	0.4	0.8	0.3	0.8	0.3
Cadmium	DETSC 2301#	0.1	mg/kg	< 0.1	0.2	0.1	0.2	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	12	9.3	13	17	17	15
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	56	14	23	26	37	25
Lead	DETSC 2301#	0.3	mg/kg	20	10	13	25	59	14
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.07	0.14	< 0.05
Nickel	DETSC 2301#	1	mg/kg	51	10	16	17	23	16
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	2.3	0.5	3.8	0.8	1.8
Zinc	DETSC 2301#	1	mg/kg	27	27	44	47	57	46
Inorganics									
pH	DETSC 2008#		pH	7.9	11.4	10.7	8.2	7.0	7.9
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	1.1	0.8	4.6	0.6	0.6	0.9
Chloride Aqueous Extract	DETSC 2055	1	mg/l	11	22	6.1	7.3	7.9	9.0
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	320	270	160	52	25	60
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	1740	8640	2940	625	777	562
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	5.85	< 3.40	< 3.40	< 3.40	10.66	< 3.40
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	10.66	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 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	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	1.00	0.85	1.24	0.94	0.91	0.92
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00	10.66	< 10.00
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 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	< 0.01

Summary of Chemical Analysis

Soil Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143131	2143133	2143136	2143139	2143144	2143146
Sample ID	WS301	WS302	WS303	WS304	WS306	TP02
Depth	0.90	0.70	1.50	1.30	1.20	1.50
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	08/03/2023	09/03/2023	10/03/2023	08/03/2023	08/03/2023	10/03/2023
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	< 0.01
PAHs									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 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	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.10	< 0.03	0.10	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.18	< 0.03	0.12	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.15	< 0.03	0.07	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.06	< 0.03	0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.10	< 0.03	0.06	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.09	< 0.03	0.05	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.06	< 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	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 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	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	0.75	< 0.10	0.40	< 0.10
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	0.5	< 0.3	< 0.3	0.4	0.5	< 0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143147	2143148	2143150	2143152
Sample ID	TP02	TP02	WS308	WS309
Depth	2.00	2.80	0.80	0.70
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	10/03/2023	10/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	12	9.8	9.8	16
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.8	0.2	< 0.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.1	< 0.1	0.1
Chromium	DETSC 2301#	0.15	mg/kg	12	10	12	12
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	18	13	20	29
Lead	DETSC 2301#	0.3	mg/kg	16	10	9.4	13
Mercury	DETSC 2325#	0.05	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	13	8.3	13	22
Selenium	DETSC 2301#	0.5	mg/kg	5.0	4.9	0.6	< 0.5
Zinc	DETSC 2301#	1	mg/kg	52	22	31	42
Inorganics							
pH	DETSC 2008#		pH	8.3	10.8	8.2	7.4
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1
Cyanide, Free	DETSC 2130#	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	0.8	1.8	0.6	2.1
Chloride Aqueous Extract	DETSC 2055	1	mg/l	9.5	16	4.6	4.5
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	59	200	22	18
Sulphate as SO4, Total	DETSC 2321#	100	mg/kg	928	4350	173	204
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 >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	4.74	< 3.40	< 3.40	14.71
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	14.71
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 >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	1.29	1.04	0.93	0.93
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	< 1.40	< 1.40	< 1.40	< 1.40
Aromatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	14.71
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

Summary of Chemical Analysis

Soil Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143147	2143148	2143150	2143152
Sample ID	TP02	TP02	WS308	WS309
Depth	2.00	2.80	0.80	0.70
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	10/03/2023	10/03/2023	09/03/2023	09/03/2023
Sampling Time	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	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 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	< 0.10	< 0.10	< 0.10	< 0.10
Phenols							
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143153	2143154	2143155	2143156	2143157	2143158
Sample ID	WS301	WS301	WS302	WS302	WS303	WS303
Depth	0.90	2.30	0.70	1.20	0.30	1.50
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	09/03/2023	09/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
BS EN 12457 10:1	DETS 1009*			Y	Y	Y	Y	Y	Y
Metals									
Arsenic, Dissolved	DETS 2306	0.16	ug/l	0.75	0.49	1.5	0.25	2.5	2.1
Boron, Dissolved	DETS 2306*	12	ug/l	20	< 12	13	13	13	< 12
Cadmium, Dissolved	DETS 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03
Chromium, Dissolved	DETS 2306	0.25	ug/l	< 0.25	< 0.25	1.3	< 0.25	< 0.25	0.30
Copper, Dissolved	DETS 2306	0.4	ug/l	3.3	1.1	1.5	2.3	1.3	3.4
Lead, Dissolved	DETS 2306	0.09	ug/l	0.97	0.41	0.40	0.31	0.60	0.93
Mercury, Dissolved	DETS 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01
Nickel, Dissolved	DETS 2306	0.5	ug/l	1.1	1.1	< 0.5	< 0.5	< 0.5	< 0.5
Selenium, Dissolved	DETS 2306	0.25	ug/l	0.70	0.55	1.2	1.3	1.7	1.3
Zinc, Dissolved	DETS 2306	1.3	ug/l	4.3	6.2	1.4	2.8	< 1.3	< 1.3
Inorganics									
pH	DETS 2008		pH	7.1	7.0	10.5	8.4	6.6	8.5
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Total Hardness as CaCO3	DETS 2303	0.1	mg/l	41.9	24.7	55.7	97.9	32.2	26.3
Sulphate as SO4	DETS 2055	0.1	mg/l	45	33	30	110	23	9.8
Sulphide	DETS 2208	0.01	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Organic Carbon	DETS 2085	1	mg/l	4.6	4.2	7.3	3.5	5.0	4.9
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143153	2143154	2143155	2143156	2143157	2143158
Sample ID	WS301	WS301	WS302	WS302	WS303	WS303
Depth	0.90	2.30	0.70	1.20	0.30	1.50
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	09/03/2023	09/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	0.03	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	0.04	0.03
Pyrene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	0.03	0.02
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenols									
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143153	2143154	2143155	2143156	2143157	2143158
Sample ID	WS301	WS301	WS302	WS302	WS303	WS303
Depth	0.90	2.30	0.70	1.20	0.30	1.50
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	09/03/2023	09/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
VOCs									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143153	2143154	2143155	2143156	2143157	2143158
Sample ID	WS301	WS301	WS302	WS302	WS303	WS303
Depth	0.90	2.30	0.70	1.20	0.30	1.50
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	09/03/2023	09/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
SVOC TICs - Semi Quant	DETC 3434*			N	N	N	N	N	N
VOC TICs - Semi Quant	DETC 3432*			N	N	N	N	N	N

SVOCs									
Phenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143153	2143154	2143155	2143156	2143157	2143158
Sample ID	WS301	WS301	WS302	WS302	WS303	WS303
Depth	0.90	2.30	0.70	1.20	0.30	1.50
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	09/03/2023	09/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143159	2143160	2143161	2143162	2143163	2143164
Sample ID	WS303	WS304	WS304	WS304	WS305	WS305
Depth	3.50	0.50	1.30	1.90	0.60	1.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	10/03/2023	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
BS EN 12457 10:1	DETS 1009*			Y	Y	Y	Y	Y	Y
Metals									
Arsenic, Dissolved	DETS 2306	0.16	ug/l	0.44	1.4	1.1	0.52	0.78	< 0.16
Boron, Dissolved	DETS 2306*	12	ug/l	< 12	14	< 12	< 12	43	< 12
Cadmium, Dissolved	DETS 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETS 2306	0.25	ug/l	< 0.25	0.31	< 0.25	0.36	< 0.25	< 0.25
Copper, Dissolved	DETS 2306	0.4	ug/l	2.6	3.2	3.2	3.1	2.4	0.4
Lead, Dissolved	DETS 2306	0.09	ug/l	< 0.09	0.37	0.45	0.18	0.35	0.14
Mercury, Dissolved	DETS 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETS 2306	0.5	ug/l	< 0.5	2.0	1.7	1.8	6.7	39
Selenium, Dissolved	DETS 2306	0.25	ug/l	1.7	0.57	0.32	0.26	< 0.25	< 0.25
Zinc, Dissolved	DETS 2306	1.3	ug/l	< 1.3	< 1.3	< 1.3	< 1.3	4.6	5.2
Inorganics									
pH	DETS 2008		pH	9.2	9.8	8.1	7.9	8.1	7.5
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Total Hardness as CaCO3	DETS 2303	0.1	mg/l	5.16	5.07	8.61	6.62	33.2	21.8
Sulphate as SO4	DETS 2055	0.1	mg/l	4.2	8.4	2.8	1.4	38	46
Sulphide	DETS 2208	0.01	mg/l	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Organic Carbon	DETS 2085	1	mg/l	3.8	8.0	4.9	8.4	7.7	2.9
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	17
Aliphatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8
Aliphatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	19
Aromatic C5-C7	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	20
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143159	2143160	2143161	2143162	2143163	2143164
Sample ID	WS303	WS304	WS304	WS304	WS305	WS305
Depth	3.50	0.50	1.30	1.90	0.60	1.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	10/03/2023	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l	0.17	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.03	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.43	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	1.4	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenols									
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143159	2143160	2143161	2143162	2143163	2143164
Sample ID	WS303	WS304	WS304	WS304	WS305	WS305
Depth	3.50	0.50	1.30	1.90	0.60	1.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	10/03/2023	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
VOCs									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143159	2143160	2143161	2143162	2143163	2143164
Sample ID	WS303	WS304	WS304	WS304	WS305	WS305
Depth	3.50	0.50	1.30	1.90	0.60	1.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	10/03/2023	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
SVOC TICs - Semi Quant	DETSC 3434*			N	N	N	N	N	N
VOC TICs - Semi Quant	DETSC 3432*			N	N	N	N	N	N
SVOCs									
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	110	240	65	90	180
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143159	2143160	2143161	2143162	2143163	2143164
Sample ID	WS303	WS304	WS304	WS304	WS305	WS305
Depth	3.50	0.50	1.30	1.90	0.60	1.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	10/03/2023	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	1.0	< 1.0	< 1.0	1.8
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	2.7	< 1.0	1.3	2.9
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143165	2143166	2143167	2143168	2143169	2143170
Sample ID	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.10	1.20	0.80	1.50	2.00	2.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Preparation									
BS EN 12457 10:1	DETS 1009*			Y	Y	Y	Y	Y	Y
Metals									
Arsenic, Dissolved	DETS 2306	0.16	ug/l	1.3	4.7	0.67	0.73	1.3	2.7
Boron, Dissolved	DETS 2306*	12	ug/l	< 12	15	< 12	< 12	< 12	< 12
Cadmium, Dissolved	DETS 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETS 2306	0.25	ug/l	0.59	1.2	0.27	< 0.25	0.34	0.29
Copper, Dissolved	DETS 2306	0.4	ug/l	2.9	5.2	3.0	3.0	2.4	2.6
Lead, Dissolved	DETS 2306	0.09	ug/l	1.7	2.4	0.20	0.13	< 0.09	0.15
Mercury, Dissolved	DETS 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETS 2306	0.5	ug/l	1.7	1.2	< 0.5	< 0.5	< 0.5	< 0.5
Selenium, Dissolved	DETS 2306	0.25	ug/l	0.34	0.40	0.48	< 0.25	< 0.25	0.70
Zinc, Dissolved	DETS 2306	1.3	ug/l	2.6	2.7	< 1.3	< 1.3	< 1.3	< 1.3
Inorganics									
pH	DETS 2008		pH	8.4	8.1	7.6	7.4	7.3	8.3
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Total Hardness as CaCO3	DETS 2303	0.1	mg/l	13.1	6.00	17.4	21.0	16.3	24.1
Sulphate as SO4	DETS 2055	0.1	mg/l	16	2.2	9.1	16	8.3	20
Sulphide	DETS 2208	0.01	mg/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Organic Carbon	DETS 2085	1	mg/l	6.0	8.1	4.8	4.3	5.4	5.3
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETS 3072*	1	ug/l	< 1.0	1.2	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETS 3072*	1	ug/l	< 1.0	24	16	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETS 3072*	1	ug/l	< 1.0	8.8	16	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETS 3072*	10	ug/l	< 10	34	33	< 10	< 10	< 10
Aromatic C5-C7	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	12	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	13	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETS 3072*	10	ug/l	< 10	34	45	< 10	< 10	< 10
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143165	2143166	2143167	2143168	2143169	2143170
Sample ID	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.10	1.20	0.80	1.50	2.00	2.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	0.03	0.01	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Phenols									
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143165	2143166	2143167	2143168	2143169	2143170
Sample ID	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.10	1.20	0.80	1.50	2.00	2.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
VOCs									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143165	2143166	2143167	2143168	2143169	2143170
Sample ID	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.10	1.20	0.80	1.50	2.00	2.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
SVOC TICs - Semi Quant	DETC 3434*			N	N	N	N	N	N
VOC TICs - Semi Quant	DETC 3432*			N	N	N	N	N	N
SVOCs									
Phenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Aniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETC 3434*	1	ug/l	180	270	310	57	190	400
2-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143165	2143166	2143167	2143168	2143169	2143170
Sample ID	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.10	1.20	0.80	1.50	2.00	2.80
Other ID						
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 10.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143171	2143172	2143173	2143174
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Preparation							
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y	Y
Metals							
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	3.6	1.2	0.79	0.78
Boron, Dissolved	DETSC 2306*	12	ug/l	15	< 12	< 12	< 12
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.52	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	5.4	2.7	4.6	3.6
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.54	0.19	2.9	3.3
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.7	< 0.5	0.6	0.7
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.9	< 0.25	0.90	0.93
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	< 1.3	1.8	1.8
Inorganics							
pH	DETSC 2008		pH	10.0	8.5	10.6	9.1
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	31.9	7.50	79.5	83.7
Sulphate as SO4	DETSC 2055	0.1	mg/l	19	4.3	5.3	2.6
Sulphide	DETSC 2208	0.01	mg/l	< 0.01	< 0.01	< 0.01	0.02
Total Organic Carbon	DETSC 2085	1	mg/l	8.0	6.3	3.7	6.2
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	3.7	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	10	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	14	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	15	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143171	2143172	2143173	2143174
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01	0.01	0.01	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	0.07	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01	0.02	< 0.01	0.01
Pyrene	DETSC 3304	0.01	ug/l	0.01	0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20
Phenols							
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143171	2143172	2143173	2143174
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
VOCs							
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143171	2143172	2143173	2143174
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
1,2,3-trichloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-propylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
2-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
4-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
sec-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETC 3432	2	ug/l	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
MTBE	DETC 3432*	1	ug/l	< 1	< 1	< 1	< 1
SVOC TICs - Semi Quant	DETC 3434*			N	N	N	N
VOC TICs - Semi Quant	DETC 3432*			N	N	N	N
SVOCs							
Phenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Aniline	DETC 3434*	1	ug/l	< 1.0	7.5	4.4	14
2-Chlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Benzyl Alcohol	DETC 3434*	1	ug/l	230	240	120	460
2-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Bis(2-chloroisopropyl)ether	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
3&4-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Bis(2-chloroethoxy)methane	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,4-Dimethylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,4-Dichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
1,2,4-Trichlorobenzene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
4-Chloro-3-methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2-Methylnaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Hexachlorocyclopentadiene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,4,6-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,4,5-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2-Chloronaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,4-Dinitrotoluene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
3-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
4-Nitrophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2143171	2143172	2143173	2143174
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	2.1	< 1.0	< 10.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 10.0

Summary of Asbestos Analysis Soil Samples

Our Ref 23-06596

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2143131	WS301 0.90	SOIL	NAD	none	Ben Rose
2143133	WS302 0.70	SOIL	NAD	none	Ben Rose
2143136	WS303 1.50	SOIL	NAD	none	Ben Rose
2143139	WS304 1.30	SOIL	NAD	none	Ben Rose
2143144	WS306 1.20	SOIL	NAD	none	Ben Rose
2143146	TP02 1.50	SOIL	NAD	none	Ben Rose
2143147	TP02 2.00	SOIL	NAD	none	Ben Rose
2143148	TP02 2.80	SOIL	NAD	none	Ben Rose
2143150	WS308 0.80	SOIL	NAD	none	Ben Rose
2143152	WS309 0.70	SOIL	NAD	none	Ben Rose

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 23-06596
 Client Ref 8190
 Contract Water's Edge, Whitehaven

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2143131	WS301 0.90 SOIL	08/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143132	WS301 2.30 SOIL	08/03/23		GJ 250ml, PT 1L		
2143133	WS302 0.70 SOIL	09/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143134	WS302 1.20 SOIL	09/03/23		GJ 250ml, PT 1L		
2143135	WS303 0.30 SOIL	10/03/23		GJ 250ml, PT 1L		
2143136	WS303 1.50 SOIL	10/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143137	WS303 3.50 SOIL	10/03/23		GJ 250ml, PT 1L		
2143138	WS304 0.50 SOIL	08/03/23		GJ 250ml, PT 1L		
2143139	WS304 1.30 SOIL	08/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143140	WS304 1.90 SOIL	08/03/23		GJ 250ml, PT 1L		
2143141	WS305 0.60 SOIL	09/03/23		GJ 250ml, PT 1L		
2143142	WS305 1.80 SOIL	09/03/23		GJ 250ml, PT 1L		
2143143	WS306 0.10 SOIL	08/03/23		GJ 250ml, PT 1L		
2143144	WS306 1.20 SOIL	08/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143145	TP02 0.80 SOIL	10/03/23		GJ 250ml, PT 1L		
2143146	TP02 1.50 SOIL	10/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143147	TP02 2.00 SOIL	10/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143148	TP02 2.80 SOIL	10/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143149	WS308 0.60 SOIL	09/03/23		GJ 250ml, PT 1L		
2143150	WS308 0.80 SOIL	09/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143151	WS309 0.30 SOIL	09/03/23		GJ 250ml, PT 1L		
2143152	WS309 0.70 SOIL	09/03/23		GJ 250ml, PT 1L	pH + Conductivity (7 days)	
2143153	WS301 0.90 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143154	WS301 2.30 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143155	WS302 0.70 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143156	WS302 1.20 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143157	WS303 0.30 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143158	WS303 1.50 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143159	WS303 3.50 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143160	WS304 0.50 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143161	WS304 1.30 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143162	WS304 1.90 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143163	WS305 0.60 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143164	WS305 1.80 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143165	WS306 0.10 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143166	WS306 1.20 LEACHATE	08/03/23		GJ 250ml, PT 1L		
2143167	TP02 0.80 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143168	TP02 1.50 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143169	TP02 2.00 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143170	TP02 2.80 LEACHATE	10/03/23		GJ 250ml, PT 1L		
2143171	WS308 0.60 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143172	WS308 0.80 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143173	WS309 0.30 LEACHATE	09/03/23		GJ 250ml, PT 1L		
2143174	WS309 0.70 LEACHATE	09/03/23		GJ 250ml, PT 1L		

Information in Support of the Analytical Results

Our Ref 23-06596

Client Ref 8190

Contract Water's Edge, Whitehaven

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 23-08326

Issued: 24-Apr-23

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

Our Reference 23-08326

Client Reference 8190

Order No 2023/6034

Contract Title Water's Edge, Whitehaven

Description 4 Water samples.

Date Received 06-Apr-23

Date Started 06-Apr-23

Date Completed 24-Apr-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



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Summary of Chemical Analysis

Water Samples

Our Ref 23-08326

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2152962	2152963	2152964	2152965
Sample ID	WS301	WS302	WS303	WS306
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	05/04/2023	05/04/2023	05/04/2023	05/04/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Metals							
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	9.2	0.82	6.9	2.0
Boron, Dissolved	DETSC 2306*	12	ug/l	34	230	54	62
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.03	0.07	< 0.03	1.4
Chromium, Dissolved	DETSC 2306	0.25	ug/l	1.9	0.33	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	18	3.2	5.7	9.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09	2.6
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	19	11	4.7	100
Selenium, Dissolved	DETSC 2306	0.25	ug/l	26	13	7.2	7.3
Zinc, Dissolved	DETSC 2306	1.3	ug/l	7.8	55	4.8	60
Inorganics							
pH	DETSC 2008		pH	9.5	7.4	8.9	6.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40
Total Hardness as CaCO3	DETSC 2303	0.1	mg/l	562	765	344	430
Sulphate as SO4	DETSC 2055	0.1	mg/l	1100	770	350	460
Sulphide	DETSC 2208	0.01	mg/l	0.04	0.04	0.03	0.03
Total Organic Carbon	DETSC 2085	1	mg/l	28	11	12	29
Petroleum Hydrocarbons							
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
PAHs							
Naphthalene	DETSC 3304	0.05	ug/l	1.3	< 0.05	2.8	5.5

Summary of Chemical Analysis

Water Samples

Our Ref 23-08326

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2152962	2152963	2152964	2152965
Sample ID	WS301	WS302	WS303	WS306
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	05/04/2023	05/04/2023	05/04/2023	05/04/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	0.63	0.22
Acenaphthene	DETSC 3304	0.01	ug/l	0.16	< 0.01	1.1	1.5
Fluorene	DETSC 3304	0.01	ug/l	0.12	< 0.01	1.1	1.4
Phenanthrene	DETSC 3304	0.01	ug/l	1.4	0.04	9.7	8.7
Anthracene	DETSC 3304	0.01	ug/l	0.14	< 0.01	2.9	1.1
Fluoranthene	DETSC 3304	0.01	ug/l	1.2	0.02	28	6.3
Pyrene	DETSC 3304	0.01	ug/l	1.1	0.02	25	4.6
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.60	< 0.01	19	2.8
Chrysene	DETSC 3304	0.01	ug/l	0.60	< 0.01	21	2.3
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.81	< 0.01	31	3.4
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.30	< 0.01	9.8	1.5
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.63	< 0.01	24	2.7
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	0.50	< 0.01	19	1.9
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	4.3	0.50
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	0.46	< 0.01	16	1.6
PAH Total	DETSC 3304	0.2	ug/l	9.3	< 0.20	220	46
Phenols							
Phenol - Monohydric	DETSC 2130	100	ug/l	< 100	< 100	< 100	< 100

Summary of Chemical Analysis

Water Samples

Our Ref 23-08326

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2152962	2152963	2152964	2152965
Sample ID	WS301	WS302	WS303	WS306
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	05/04/2023	05/04/2023	05/04/2023	05/04/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
VOCs							
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1

Summary of Chemical Analysis

Water Samples

Our Ref 23-08326

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2152962	2152963	2152964	2152965
Sample ID	WS301	WS302	WS303	WS306
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	05/04/2023	05/04/2023	05/04/2023	05/04/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
1,2,3-trichloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-propylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
2-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
4-chlorotoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
sec-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETC 3432	2	ug/l	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-butylbenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETC 3432	1	ug/l	< 1	< 1	< 1	< 1
MTBE	DETC 3432*	1	ug/l	< 1	< 1	< 1	< 1
SVOC TICs - Semi Quant	DETC 3434*			N	N	N	N
VOC TICs - Semi Quant	DETC 3432*			N	N	N	N
SVOCs							
Phenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 23-08326

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2152962	2152963	2152964	2152965
Sample ID	WS301	WS302	WS303	WS306
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	05/04/2023	05/04/2023	05/04/2023	05/04/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

Information in Support of the Analytical Results

Our Ref 23-08326
 Client Ref 8190
 Contract Water's Edge, Whitehaven

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2152962	WS301 WATER	05/04/23	GB 1L, PB 1L		
2152963	WS302 WATER	05/04/23	GB 1L, PB 1L		
2152964	WS303 WATER	05/04/23	GB 1L, PB 1L		
2152965	WS306 WATER	05/04/23	GB 1L, PB 1L		

Key: G-Glass P-Plastic B-Bottle

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.

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 23-09992

Issued: 10-May-23

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

Our Reference 23-09992

Client Reference 8190

Order No 2023/5979

Contract Title Water's Edge, Whitehaven

Description 15 Leachate samples.

Date Received 20-Mar-23

Date Started 26-Apr-23

Date Completed 10-May-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

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-09992

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2162401	2162402	2162403	2162404	2162405	2162406	2162407	2162408	2162409	2162410	2162411
Sample ID	WS304	WS304	WS304	WS305	WS305	WS306	WS306	TP02	TP02	TP02	TP02
Depth	0.50	1.30	1.90	0.60	1.80	0.10	1.20	0.80	1.50	2.00	2.80
Other ID											
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	08/03/2023	08/03/2023	08/03/2023	09/03/2023	09/03/2023	08/03/2023	08/03/2023	10/03/2023	10/03/2023	10/03/2023	10/03/2023
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units											
Preparation														
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SVOCs														
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	1.7	12	3.3	3.6	< 1.0	1.6	< 1.0	13	6.9	39

Summary of Chemical Analysis

Leachate Samples

Our Ref 23-09992

Client Ref 8190

Contract Title Water's Edge, Whitehaven

Lab No	2162412	2162413	2162414	2162415
Sample ID	WS308	WS308	WS309	WS309
Depth	0.60	0.80	0.30	0.70
Other ID				
Sample Type	LEACHATE	LEACHATE	LEACHATE	LEACHATE
Sampling Date	09/03/2023	09/03/2023	09/03/2023	09/03/2023
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Preparation							
BS EN 12457 10:1	DETSC 1009*			Y	Y	Y	Y
SVOCs							
Benzyl Alcohol	DETSC 3434*	1	ug/l	8.5	< 1.0	< 1.0	1.1

Information in Support of the Analytical Results

Our Ref 23-09992
 Client Ref 8190
 Contract Water's Edge, Whitehaven

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2162401	WS304 0.50 LEACHATE	08/03/23	GJ 250ml, PT 1L		
2162402	WS304 1.30 LEACHATE	08/03/23	GJ 250ml, PT 1L		
2162403	WS304 1.90 LEACHATE	08/03/23	GJ 250ml, PT 1L		
2162404	WS305 0.60 LEACHATE	09/03/23	GJ 250ml, PT 1L		
2162405	WS305 1.80 LEACHATE	09/03/23	GJ 250ml, PT 1L		
2162406	WS306 0.10 LEACHATE	08/03/23	GJ 250ml, PT 1L		
2162407	WS306 1.20 LEACHATE	08/03/23	GJ 250ml, PT 1L		
2162408	TP02 0.80 LEACHATE	10/03/23	GJ 250ml, PT 1L		
2162409	TP02 1.50 LEACHATE	10/03/23	GJ 250ml, PT 1L		
2162410	TP02 2.00 LEACHATE	10/03/23	GJ 250ml, PT 1L		
2162411	TP02 2.80 LEACHATE	10/03/23	GJ 250ml, PT 1L		
2162412	WS308 0.60 LEACHATE	09/03/23	GJ 250ml, PT 1L		
2162413	WS308 0.80 LEACHATE	09/03/23	GJ 250ml, PT 1L		
2162414	WS309 0.30 LEACHATE	09/03/23	GJ 250ml, PT 1L		
2162415	WS309 0.70 LEACHATE	09/03/23	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.

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

CHEMICAL STATISTICAL ANALYSIS

APPENDIX 5.1

MADE GROUND SOILS

Landuse	SOM%		PROJECT:	MADE GROUND, WATERS EDGE, WHITEHAVEN				
Residential with Gardens	1		REF.	8190				
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		28	0	5.50	0.40	1.86	2.81
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	28	0	29.00	4.50	12.01	13.73
Boron	mg/kg	290	28	0	1.90	0.30	1.09	1.26
Cadmium	mg/kg	11	28	0	0.50	0.05	0.13	0.17
Chromium III	mg/kg	910	28	0	24.00	3.30	12.33	14.03
Chromium VI	mg/kg	6	28	0	0.50	0.50	0.50	0.50
Copper	mg/kg	2400	28	0	360.00	11.00	36.04	56.75
Lead	mg/kg	200	28	0	200.00	6.70	23.35	34.90
Elemental Mercury	mg/kg	1.2	28	0	0.200	0.025	0.054	0.070
Nickel	mg/kg	180	28	0	57.00	6.40	16.54	20.52
Zinc	mg/kg	3700	28	0	270.00	15.00	50.79	66.86
Cyanide Total	mg/kg		28	0	0.900	0.050	0.211	0.279
Inorganic Cyanide	mg/kg	26.8	28	0	0.20	0.05	0.07	0.08
Aliphatic EC 5-6	mg/kg	42	28	0	0.04	0.01	0.01	0.01
Aliphatic EC >6-8	mg/kg	100	28	0	0.12	0.01	0.01	0.02
Aliphatic EC >8-10	mg/kg	27	28	0	0.52	0.01	0.04	0.08
Aliphatic EC >10-12	mg/kg	130	28	0	6.70	0.75	0.96	1.32
Aliphatic EC >12-16	mg/kg	1100	28	0	4.40	0.60	0.74	0.97
Aliphatic C16-C21	mg/kg		28	0	2.00	0.75	0.79	0.87
Aliphatic C21-C35	mg/kg		28	0	10.66	1.70	2.28	2.89
Aliphatic EC >16-35	mg/kg	65000	28	0	11.41	2.45	3.07	3.68
Aliphatic C5-C35	mg/kg		28	0	13.00	5.00	5.49	6.07
Aromatic EC 5-7 (benzene)	mg/kg	70	28	0	0.04	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	130	28	0	0.07	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	34	28	0	0.43	0.01	0.03	0.07
Aromatic EC >10-12	mg/kg	74	28	0	0.45	0.45	0.45	0.45
Aromatic EC >12-16	mg/kg	140	28	0	30.00	0.25	1.53	3.37
Aromatic EC >16-21	mg/kg	260	28	0	64.00	0.30	3.11	6.97
Aromatic EC >21-35	mg/kg	1100	28	0	18.00	0.70	2.17	3.64
Aromatic C5-C35	mg/kg		28	0	110.00	5.00	9.61	16.03
TPH Ali/Aro	mg/kg		28	0	130.00	5.00	10.52	18.14
Benzene	mg/kg	0.087	28	0	0.04	0.01	0.01	0.01
Ethylbenzene	mg/kg	47	28	0	0.01	0.01	0.01	0.01
Toluene	mg/kg	130	28	0	0.07	0.01	0.01	0.01
Xylenes	mg/kg	56	28	0	0.25	0.01	0.01	0.03
MTBE	mg/kg		28	0	0.01	0.01	0.01	0.01
PAHs								
Naphthalene	mg/kg	2.3	28	0	0.30	0.02	0.06	0.08
Acenaphthylene	mg/kg	170	28	0	11.00	0.02	0.47	1.13
Acenaphthene	mg/kg	210	28	0	2.30	0.02	0.13	0.27
Fluorene	mg/kg	170	28	0	5.50	0.02	0.28	0.61
Phenanthrene	mg/kg	95	28	0	3.50	0.02	0.24	0.46
Anthracene	mg/kg	2400	28	0	1.30	0.02	0.11	0.19
Fluoranthene	mg/kg	280	28	0	10.00	0.02	0.73	1.44
Pyrene	mg/kg	620	28	0	8.60	0.02	0.69	1.35
Benzo(a)anthracene	mg/kg	7.2	28	0	4.20	0.02	0.40	0.73
Chrysene	mg/kg	15	28	0	4.20	0.02	0.38	0.73
Benzo(b)fluoranthene	mg/kg	2.6	28	2	4.80	0.02	0.37	0.73
Benzo(k)fluoranthene	mg/kg	77	28	0	2.50	0.02	0.22	0.40
Benzo(a)pyrene	mg/kg	2.2	28	2	5.60	0.02	0.43	0.83
Indeno(1,2,3-c,d)pyrene	mg/kg	27	28	0	3.40	0.02	0.26	0.49
Dibenzo(a,h)anthracene	mg/kg	0.24	28	2	0.40	0.02	0.07	0.10
Benzo(g,h,i)perylene	mg/kg	320	28	0	3.80	0.02	0.29	0.55
PAH	mg/kg		28	0	47.00	0.05	4.95	15.02
Phenol	mg/kg	120	28	0	5.60	0.15	0.44	0.78

BUILDINGS AND SERVICES								
pH		5	28	0	11.40	7.00	9.41	9.84
Chloride Aqueous Extract	mg/l	100	28	0	22.00	4.40	10.75	12.10
Sulphate Aqueous Extract as SO4	mg/l	500	28	7	1500.00	25.00	461.32	602.92
Total Sulphate as SO4	%		28	0	8640.00	0.10	631.05	1210.83
PLANTS								
Copper	mg/kg	600	28	0	360.00	11.00	36.04	56.75
Nickel	mg/kg	250	28	0	57.00	6.40	16.54	20.52
Zinc	mg/kg	3000	28	0	270.00	15.00	50.79	66.86
Boron	mg/kg	30	28	0	1.90	0.30	1.09	1.26
Cadmium	mg/kg	15	28	0	0.50	0.05	0.13	0.17
Chromium VI	mg/kg	600	28	0	1	1	1	1
Total Chromium	mg/kg	1000	28	0	24.00	3.30	12.33	14.03
Mercury	mg/kg	20	28	0	0.200	0.025	0.054	0.070
Lead	mg/kg	2000	28	0	200.00	6.70	23.35	34.90
Arsenic	mg/kg	80	28	0	29.00	4.50	12.01	13.73

APPENDIX 5.2

DRAINAGE HOTSPOT SOILS

Landuse	SOM%	PROJECT: Hydrocarbon Contamination - Made Ground						
Residential with Gardens	6	REF. 8190 - Water's Edge, Whitehaven						
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		3	0	13.00	2.10	5.77	-
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	3	0	26.00	16.00	19.67	-
Boron	mg/kg	290	3	0	1.20	0.40	0.90	-
Cadmium	mg/kg	11	3	0	0.20	0.05	0.12	-
Chromium III	mg/kg	910	3	0	21.00	18.00	19.00	-
Chromium VI	mg/kg	6	3	0	0.50	0.50	0.50	-
Copper	mg/kg	2400	3	0	84.00	29.00	48.67	-
Lead	mg/kg	200	3	0	36.00	25.00	29.66	-
Elemental Mercury	mg/kg	1.2	3	0	0.080	0.025	0.043	-
Nickel	mg/kg	180	3	0	35.00	20.00	25.67	-
Zinc	mg/kg	3700	3	0	160.00	42.00	86.33	-
Cyanide Total	mg/kg		3	0	0.700	0.050	0.450	-
Inorganic Cyanide	mg/kg	26.8	3	0	0.05	0.05	0.05	-
Aliphatic EC 5-6	mg/kg	160	10	0	0.06	0.01	0.01	0.02
Aliphatic EC >6-8	mg/kg	530	10	0	0.01	0.01	0.01	0.01
Aliphatic EC >8-10	mg/kg	150	10	0	0.34	0.01	0.06	0.13
Aliphatic EC >10-12	mg/kg	760	10	0	0.75	0.75	0.75	0.75
Aliphatic EC >12-16	mg/kg	4300	10	0	10.00	0.60	2.69	4.76
Aliphatic C16-C21	mg/kg		10	0	85.00	0.75	12.86	28.24
Aliphatic C21-C35	mg/kg		10	0	1100.00	1.70	126.82	325.78
Aliphatic EC >16-35	mg/kg	110000	10	0	1185.00	2.45	139.68	353.64
Aliphatic C5-C35	mg/kg		10	0	1200.00	5.00	144.50	360.65
Aromatic EC 5-7 (benzene)	mg/kg	300	10	0	0.01	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	660	10	0	0.01	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	190	10	0	0.01	0.01	0.01	0.01
Aromatic EC >10-12	mg/kg	380	10	0	3.90	0.45	0.80	1.43
Aromatic EC >12-16	mg/kg	660	10	1	1600.00	0.25	244.23	536.88
Aromatic EC >16-21	mg/kg	930	10	1	1900.00	0.30	320.74	675.35
Aromatic EC >21-35	mg/kg	1700	10	1	5000.00	0.70	555.55	1462.01
Aromatic C5-C35	mg/kg		10	0	6900.00	5.00	1120.30	2387.85
TPH Ali/Aro	mg/kg		10	0	8100.00	5.00	1260.30	2735.81
Benzene	mg/kg	0.37	3	0	0.01	0.01	0.01	-
Ethylbenzene	mg/kg	260	10	0	0.01	0.01	0.01	0.01
Toluene	mg/kg	660	10	0	0.01	0.01	0.01	0.01
Xylenes	mg/kg	310	10	0	0.01	0.01	0.01	0.01
MTBE	mg/kg		10	0	0.01	0.01	0.01	0.01
PAHs								
Naphthalene	mg/kg	13	3	0	1.20	0.05	0.43	-
Acenaphthylene	mg/kg	920	3	0	53.00	0.10	20.53	-
Acenaphthene	mg/kg	1100	3	0	14.00	0.05	8.68	-
Fluorene	mg/kg	860	3	0	9.40	0.05	5.45	-
Phenanthrene	mg/kg	440	3	0	12.00	0.05	4.05	-
Anthracene	mg/kg	11000	3	0	2.80	0.05	0.97	-
Fluoranthene	mg/kg	890	3	0	51.00	0.20	18.47	-
Pyrene	mg/kg	2000	3	0	3.50	0.05	1.45	-
Benzo(a)anthracene	mg/kg	13	3	0	0.05	0.05	0.05	-
Chrysene	mg/kg	27	3	0	0.05	0.05	0.05	-
Benzo(b)fluoranthene	mg/kg	3.7	3	0	0.05	0.05	0.05	-
Benzo(k)fluoranthene	mg/kg	100	3	0	0.05	0.05	0.05	-
Benzo(a)pyrene	mg/kg	3	3	0	0.05	0.05	0.05	-
Indeno(1,2,3-c,d)pyrene	mg/kg	41	3	0	0.05	0.05	0.05	-
Dibenzo(a,h)anthracene	mg/kg	0.3	3	0	0.05	0.05	0.05	-
Benzo(g,h,i)perylene	mg/kg	350	3	0	0.05	0.05	0.05	-
PAH	mg/kg		3	0	99.00	0.80	60.27	-
Phenol	mg/kg	380	3	0	5.90	0.15	3.88	-

BUILDINGS AND SERVICES								
pH		5	3	0	8.00	7.60	7.77	-
Chloride Aqueous Extract	mg/l	100	3	0	11.00	9.60	10.17	-
Sulphate Aqueous Extract as SO4	mg/l	500	3	2	1500.00	100.00	933.33	-
Total Sulphate as SO4	%		3	0	1.00	0.55	0.71	-
PLANTS								
Copper	mg/kg	600	3	0	84.00	29.00	48.67	-
Nickel	mg/kg	250	3	0	35.00	20.00	25.67	-
Zinc	mg/kg	3000	3	0	160.00	42.00	86.33	-
Boron	mg/kg	30	3	0	1.20	0.40	0.90	-
Cadmium	mg/kg	15	3	0	0.20	0.05	0.12	-
Chromium VI	mg/kg	600	3	0	1	1	1	-
Total Chromium	mg/kg	1000	3	0	21.00	18.00	19.00	-
Mercury	mg/kg	20	3	0	0.080	0.025	0.043	-
Lead	mg/kg	2000	3	0	36.00	25.00	29.66	-
Arsenic	mg/kg	80	3	0	26.00	16.00	19.67	-

Landuse	SOM%		PROJECT:	Hydrocarbon Contamination - Natural Clay				
Residential with Gardens	1		REF.	8190 - Water's Edge, Whitehaven				
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Organic matter	%		3	0	2.50	0.70	1.73	-
HUMAN HEALTH								
Inorganic Arsenic	mg/kg	37	3	0	15.00	13.00	14.00	-
Boron	mg/kg	290	3	0	1.80	0.10	0.87	-
Cadmium	mg/kg	11	3	0	0.20	0.05	0.12	-
Chromium III	mg/kg	910	3	0	20.00	11.00	16.67	-
Chromium VI	mg/kg	6	3	0	0.50	0.50	0.50	-
Copper	mg/kg	2400	3	0	31.00	22.00	27.33	-
Lead	mg/kg	200	3	0	37.00	18.00	24.84	-
Elemental Mercury	mg/kg	1.2	3	0	0.025	0.025	0.025	-
Nickel	mg/kg	180	3	0	22.00	13.00	17.67	-
Zinc	mg/kg	3700	3	0	57.00	34.00	45.67	-
Cyanide Total	mg/kg		3	0	0.100	0.050	0.067	-
Inorganic Cyanide	mg/kg	26.8	3	0	0.05	0.05	0.05	-
Aliphatic EC 5-6	mg/kg	42	6	0	0.01	0.01	0.01	0.01
Aliphatic EC >6-8	mg/kg	100	6	0	0.01	0.01	0.01	0.01
Aliphatic EC >8-10	mg/kg	27	6	0	1.90	0.01	0.32	0.96
Aliphatic EC >10-12	mg/kg	130	6	0	0.75	0.75	0.75	0.75
Aliphatic EC >12-16	mg/kg	1100	6	0	0.60	0.60	0.60	0.60
Aliphatic C16-C21	mg/kg		6	0	0.75	0.75	0.75	0.75
Aliphatic C21-C35	mg/kg		6	0	6.70	1.70	2.53	4.21
Aliphatic EC >16-35	mg/kg	65000	6	0	7.45	2.45	3.28	4.96
Aliphatic C5-C35	mg/kg		6	0	5.00	5.00	5.00	5.00
Aromatic EC 5-7 (benzene)	mg/kg	70	6	0	0.01	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	130	6	0	0.01	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	34	6	0	0.19	0.01	0.04	0.10
Aromatic EC >10-12	mg/kg	74	6	0	0.45	0.45	0.45	0.45
Aromatic EC >12-16	mg/kg	140	6	1	370.00	0.25	64.73	187.80
Aromatic EC >16-21	mg/kg	260	6	0	100.00	0.30	22.73	55.39
Aromatic EC >21-35	mg/kg	1100	6	0	44.00	0.70	10.30	24.67
Aromatic C5-C35	mg/kg		6	0	520.00	5.00	100.67	270.41
TPH Ali/Aro	mg/kg		6	0	520.00	5.00	100.67	270.41
Benzene	mg/kg	0.087	3	0	0.01	0.01	0.01	-
Ethylbenzene	mg/kg	47	6	0	0.08	0.01	0.02	0.04
Toluene	mg/kg	130	6	0	0.01	0.01	0.01	0.01
Xylenes	mg/kg	56	6	0	0.09	0.01	0.02	0.05
MTBE	mg/kg		6	0	0.01	0.01	0.01	0.01
PAHs								
Naphthalene	mg/kg	2.3	3	0	0.20	0.05	0.10	-
Acenaphthylene	mg/kg	170	3	0	5.20	0.05	1.77	-
Acenaphthene	mg/kg	210	3	0	2.80	0.05	0.97	-
Fluorene	mg/kg	170	3	0	0.20	0.05	0.10	-
Phenanthrene	mg/kg	95	3	0	0.05	0.05	0.05	-
Anthracene	mg/kg	2400	3	0	0.05	0.05	0.05	-
Fluoranthene	mg/kg	280	3	0	0.05	0.05	0.05	-
Pyrene	mg/kg	620	3	0	0.05	0.05	0.05	-
Benzo(a)anthracene	mg/kg	7.2	3	0	0.05	0.05	0.05	-
Chrysene	mg/kg	15	3	0	0.05	0.05	0.05	-
Benzo(b)fluoranthene	mg/kg	2.6	3	0	0.05	0.05	0.05	-
Benzo(k)fluoranthene	mg/kg	77	3	0	0.05	0.05	0.05	-
Benzo(a)pyrene	mg/kg	2.2	3	0	0.05	0.05	0.05	-
Indeno(1,2,3-c,d)pyrene	mg/kg	27	3	0	0.05	0.05	0.05	-
Dibenzo(a,h)anthracene	mg/kg	0.24	3	0	0.05	0.05	0.05	-
Benzo(g,h,i)perylene	mg/kg	320	3	0	0.05	0.05	0.05	-
PAH	mg/kg		3	0	8.30	0.80	3.30	-
Phenol	mg/kg	120	3	0	0.50	0.15	0.27	-

BUILDINGS AND SERVICES								
pH		5	3	0	10.30	7.90	8.97	-
Chloride Aqueous Extract	mg/l	100	3	0	16.00	11.00	13.00	-
Sulphate Aqueous Extract as SO4	mg/l	500	3	1	610.00	120.00	393.33	-
Total Sulphate as SO4	%		3	0	0.47	0.08	0.31	-
PLANTS								
Copper	mg/kg	600	3	0	31.00	22.00	27.33	-
Nickel	mg/kg	250	3	0	22.00	13.00	17.67	-
Zinc	mg/kg	3000	3	0	57.00	34.00	45.67	-
Boron	mg/kg	30	3	0	1.80	0.10	0.87	-
Cadmium	mg/kg	15	3	0	0.20	0.05	0.12	-
Chromium VI	mg/kg	600	3	0	1	1	1	-
Total Chromium	mg/kg	1000	3	0	20.00	11.00	16.67	-
Mercury	mg/kg	20	3	0	0.025	0.025	0.025	-
Lead	mg/kg	2000	3	0	37.00	18.00	24.84	-
Arsenic	mg/kg	80	3	0	15.00	13.00	14.00	-

APPENDIX 5.3

NATURAL SUPERFICIAL SOILS

Landuse	SOM%		PROJECT:	Natural Clay			
Residential with Gardens	1		REF.	8190 - Water's Edge, Whitehaven			
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean
Organic matter	%		3	0	4.60	0.60	2.43
HUMAN HEALTH							
Inorganic Arsenic	mg/kg	37	3	0	16.00	8.50	11.43
Boron	mg/kg	290	3	0	0.80	0.10	0.37
Cadmium	mg/kg	11	3	0	0.10	0.05	0.08
Chromium III	mg/kg	910	3	0	13.00	12.00	12.33
Chromium VI	mg/kg	6	3	0	0.50	0.50	0.50
Copper	mg/kg	2400	3	0	29.00	20.00	24.00
Lead	mg/kg	200	3	0	13.00	9.40	11.67
Elemental Mercury	mg/kg	1.2	3	0	0.025	0.025	0.025
Nickel	mg/kg	180	3	0	22.00	13.00	17.00
Zinc	mg/kg	3700	3	0	44.00	31.00	39.00
Cyanide Total	mg/kg		3	0	0.050	0.050	0.050
Inorganic Cyanide	mg/kg	26.8	3	0	0.05	0.05	0.05
Aliphatic EC 5-6	mg/kg	42	3	0	0.01	0.01	0.01
Aliphatic EC >6-8	mg/kg	100	3	0	0.01	0.01	0.01
Aliphatic EC >8-10	mg/kg	27	3	0	0.01	0.01	0.01
Aliphatic EC >10-12	mg/kg	130	3	0	0.75	0.75	0.75
Aliphatic EC >12-16	mg/kg	1100	3	0	0.60	0.60	0.60
Aliphatic C16-C21	mg/kg		3	0	0.75	0.75	0.75
Aliphatic C21-C35	mg/kg		3	0	14.71	1.70	6.04
Aliphatic EC >16-35	mg/kg	65000	3	0	15.46	2.45	6.79
Aliphatic C5-C35	mg/kg		3	0	14.71	5.00	8.24
Aromatic EC 5-7 (benzene)	mg/kg	70	3	0	0.01	0.01	0.01
Aromatic EC >7-8 (toluene)	mg/kg	130	3	0	0.01	0.01	0.01
Aromatic EC >8-10	mg/kg	34	3	0	0.01	0.01	0.01
Aromatic EC >10-12	mg/kg	74	3	0	0.45	0.45	0.45
Aromatic EC >12-16	mg/kg	140	3	0	0.25	0.25	0.25
Aromatic EC >16-21	mg/kg	260	3	0	1.24	0.93	1.03
Aromatic EC >21-35	mg/kg	1100	3	0	0.70	0.70	0.70
Aromatic C5-C35	mg/kg		3	0	5.00	5.00	5.00
TPH Ali/Aro	mg/kg		3	0	14.71	5.00	8.24
Benzene	mg/kg	0.087	3	0	0.01	0.01	0.01
Ethylbenzene	mg/kg	47	3	0	0.01	0.01	0.01
Toluene	mg/kg	130	3	0	0.01	0.01	0.01
Xylenes	mg/kg	56	3	0	0.01	0.01	0.01
MTBE	mg/kg		3	0	0.01	0.01	0.01
PAHs							
Naphthalene	mg/kg	2.3	3	0	0.02	0.02	0.02
Acenaphthylene	mg/kg	170	3	0	0.02	0.02	0.02
Acenaphthene	mg/kg	210	3	0	0.02	0.02	0.02
Fluorene	mg/kg	170	3	0	0.02	0.02	0.02
Phenanthrene	mg/kg	95	3	0	0.10	0.02	0.04
Anthracene	mg/kg	2400	3	0	0.02	0.02	0.02
Fluoranthene	mg/kg	280	3	0	0.18	0.02	0.07
Pyrene	mg/kg	620	3	0	0.15	0.02	0.06
Benzo(a)anthracene	mg/kg	7.2	3	0	0.06	0.02	0.03
Chrysene	mg/kg	15	3	0	0.10	0.02	0.04
Benzo(b)fluoranthene	mg/kg	2.6	3	0	0.09	0.02	0.04
Benzo(k)fluoranthene	mg/kg	77	3	0	0.03	0.02	0.02
Benzo(a)pyrene	mg/kg	2.2	3	0	0.06	0.02	0.03
Indeno(1,2,3-c,d)pyrene	mg/kg	27	3	0	0.03	0.02	0.02
Dibenzo(a,h)anthracene	mg/kg	0.24	3	0	0.02	0.02	0.02
Benzo(g,h,i)perylene	mg/kg	320	3	0	0.03	0.02	0.02
PAH	mg/kg		3	0	0.75	0.05	0.28
Phenol	mg/kg	120	3	0	0.15	0.15	0.15

BUILDINGS AND SERVICES							
pH		5	3	0	10.70	7.40	8.77
Chloride Aqueous Extract	mg/l	100	3	0	6.10	4.50	5.07
Sulphate Aqueous Extract as SO4	mg/l	500	3	0	160.00	18.00	66.67
Total Sulphate as SO4	%		3	0	2940.00	173.00	1105.67
PLANTS							
Copper	mg/kg	600	3	0	29.00	20.00	24.00
Nickel	mg/kg	250	3	0	22.00	13.00	17.00
Zinc	mg/kg	3000	3	0	44.00	31.00	39.00
Boron	mg/kg	30	3	0	0.80	0.10	0.37
Cadmium	mg/kg	15	3	0	0.10	0.05	0.08
Chromium VI	mg/kg	600	3	0	1	1	1
Total Chromium	mg/kg	1000	3	0	13.00	12.00	12.33
Mercury	mg/kg	20	3	0	0.025	0.025	0.025
Lead	mg/kg	2000	3	0	13.00	9.40	11.67
Arsenic	mg/kg	80	3	0	16.00	8.50	11.43

APPENDIX 5.4

LEACHATE

PROJECT:		MADE GROUND LEACHATE, WATERS EDGE, WHITEHAVEN						
REF.	8190							
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Hardness	mg/l		13	0	79.50	5.07	27.38	53.22
HUMAN HEALTH								
Arsenic	ug/l	50	13	0	4.70	0.67	1.64	2.26
Boron (water soluble)	ug/l	1000	13	0	43.00	6.00	12.46	17.60
Cadmium	ug/l	0.6	13	0	0.02	0.02	0.02	0.02
Chromium III	ug/l	32	13	0	1.30	0.13	0.42	0.62
Copper	ug/l	1	13	13	5.40	1.50	3.28	3.84
Lead	ug/l	14	13	0	2.90	0.05	0.82	1.27
Mercury	ug/l	0.07	13	0	0.01	0.01	0.01	0.01
Nickel	ug/l	34	13	0	6.70	0.25	1.30	2.16
Selenium	ug/l	10	13	0	1.90	0.13	0.61	0.86
Zinc	ug/l	10.9	13	0	4.60	0.65	1.69	2.40
Inorganics								
pH	pH		13	0	10.60	7.10	8.56	9.17
Cyanide Total	ug/l	5	13	<D.L	20.00	20.00	20.00	20.00
Sulphate Aqueous Extract as SO4	mg/l	250	12	0	45.00	2.80	18.16	25.05
Petroleum Hydrocarbons								
Aliphatic C5-C6	ug/l	10	13	0	0.05	0.05	0.05	0.05
Aliphatic C6-C8	ug/l	10	13	0	0.05	0.05	0.05	0.05
Aliphatic C8-C10	ug/l	10	13	0	0.50	0.05	0.08	0.15
Aliphatic C10-C12	ug/l	10	13	0	1.20	0.50	0.55	0.65
Aliphatic C12-C16	ug/l	10	13	1	24.00	0.50	2.31	5.53
Aliphatic C16-C21	ug/l	10	13	1	16.00	0.50	2.33	4.66
Aliphatic C21-C35	ug/l	10	13		32.80	0.50	4.18	8.93
Aliphatic C5-C35	ug/l		13	0	34.00	5.00	9.38	14.68
Aromatic C5-C7	ug/l	10	13	0	0.05	0.05	0.05	0.05
Aromatic C7-C8	ug/l	10	13	0	0.05	0.05	0.05	0.05
Aromatic C8-C10	ug/l	10	13	0	0.05	0.05	0.05	0.05
Aromatic C10-C12	ug/l	10	13	0	0.50	0.50	0.50	0.50
Aromatic C12-C16	ug/l	10	13	0	0.50	0.50	0.50	0.50
Aromatic C16-C21	ug/l	10	13	1	12.00	0.50	1.38	2.96
Aromatic C21-C35	ug/l	10	13	0	0.50	0.50	0.50	0.50
Aromatic C5-C35	ug/l		13		13.00	5.00	5.62	6.71
TPH Ali/Aro	ug/l		13		45.00	5.00	10.31	16.81
Benzene	ug/l	50	13	0	0.50	0.50	0.50	0.50
Toluene	ug/l	380	13	0	0.50	0.50	0.50	0.50
PAHs								
Naphthalene	ug/l	130	13	0	0.0250	0.0250	0.0250	0.0250
Anthracene	ug/l	0.1	13	0	0.0050	0.0050	0.0050	0.0050
Fluoranthene	ug/l	0.12	13	0	0.0200	0.0050	0.0069	0.0091
Benzo(b)fluoranthene	ug/l	0.017	13	0	0.0050	0.0050	0.0050	0.0050
Benzo(k)fluoranthene	ug/l	0.017	13	0	0.0050	0.0050	0.0050	0.0050
Benzo(a)pyrene	ug/l	0.27	13	0	0.0200	0.0050	0.0062	0.0082
Indeno(1,2,3-c,d)pyrene	ug/l	0.00017	13	<D.L	0.0050	0.0050	0.0050	0.0050
Benzo(g,h,i)perylene	ug/l	0.0082	13	1	0.0200	0.0050	0.0062	0.0082
PAH	ug/l	0.1	13	0	0.1000	0.1000	0.1000	0.1000
Phenols								
Phenol	ug/l	46	13	<D.L	50.00	50.00	50.00	50.00
VOCs / SVOCs								
Aniline	ug/l		12	0	5.00	0.50	1.20	3.26
Benzyl Alcohol	ug/l		12	0	39.00	0.50	6.28	20.23
Di-n-butylphthalate	ug/l		12	0	5.00	0.50	0.92	2.55
Dimethylphthalate	ug/l		12	0	5.00	0.50	1.13	2.87

	PROJECT:	NATURAL LEACHATE, WATERS EDGE, WHITEHAVEN						
	REF.	8190						
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean	Upper 95%ile
Hardness	mg/l		9	0	97.90	5.16	33.99	83.10
HUMAN HEALTH								
Arsenic	ug/l	50	9	0	2.50	0.08	0.93	1.45
Boron (water soluble)	ug/l	1000	9	0	13.00	6.00	7.56	9.47
Cadmium	ug/l	0.6	9	0	0.03	0.02	0.02	0.02
Chromium III	ug/l	32	9	0	0.36	0.13	0.17	0.23
Copper	ug/l	1	9	8	3.60	0.40	2.28	2.97
Lead	ug/l	14	9	0	3.30	0.05	0.68	1.31
Mercury	ug/l	0.07	9	0	0.02	0.01	0.01	0.01
Nickel	ug/l	34	9	1	39.00	0.25	4.87	12.81
Selenium	ug/l	10	9	0	1.70	0.13	0.89	1.29
Zinc	ug/l	10.9	9	0	6.20	0.65	2.14	3.48
Inorganics								
pH	pH		9	0	9.20	6.60	8.08	8.64
Cyanide Total	ug/l	5	9	<D.L	20.00	20.00	20.00	20.00
Sulphate Aqueous Extract as SO4	mg/l	250	9	0	110.00	1.40	26.03	47.82
Petroleum Hydrocarbons								
Aliphatic C5-C6	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aliphatic C6-C8	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aliphatic C8-C10	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aliphatic C10-C12	ug/l	10	9	0	0.50	0.50	0.50	0.50
Aliphatic C12-C16	ug/l	10	9	0	3.70	0.50	0.86	1.52
Aliphatic C16-C21	ug/l	10	9	1	17.00	0.50	3.39	7.10
Aliphatic C21-C35	ug/l	10	9	0	1.80	0.50	0.64	0.91
Aliphatic C5-C35	ug/l		9		19.00	5.00	7.56	10.79
Aromatic C5-C7	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aromatic C7-C8	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aromatic C8-C10	ug/l	10	9	0	0.05	0.05	0.05	0.05
Aromatic C10-C12	ug/l	10	9	0	0.50	0.50	0.50	0.50
Aromatic C12-C16	ug/l	10	9	0	0.50	0.50	0.50	0.50
Aromatic C16-C21	ug/l	10	9	0	0.50	0.50	0.50	0.50
Aromatic C21-C35	ug/l	10	9	0	0.50	0.50	0.50	0.50
Aromatic C5-C35	ug/l		9		5.00	5.00	5.00	5.00
TPH Ali/Aro	ug/l		9		20.00	5.00	7.78	11.28
Benzene	ug/l	50	9	0	0.50	0.50	0.50	0.50
Toluene	ug/l	380	9	0	0.50	0.50	0.50	0.50
PAHs								
Naphthalene	ug/l	130	9	0	0.1700	0.0250	0.0411	0.0711
Anthracene	ug/l	0.1	9	0	0.0700	0.0050	0.0122	0.0257
Fluoranthene	ug/l	0.12	9	0	0.1100	0.0050	0.0256	0.0467
Benzo(b)fluoranthene	ug/l	0.017	9	1	0.1000	0.0050	0.0156	0.0352
Benzo(k)fluoranthene	ug/l	0.017	9	1	0.0200	0.0050	0.0067	0.0098
Benzo(a)pyrene	ug/l	0.27	9	0	0.0400	0.0050	0.0089	0.0161
Indeno(1,2,3-c,d)pyrene	ug/l	0.00017	9	1	0.0300	0.0050	0.0078	0.0129
Benzo(g,h,i)perylene	ug/l	0.0082	9	1	0.1100	0.0050	0.0167	0.0384
PAH	ug/l	0.1	9	1	1.4000	0.1000	0.2444	0.8742
Phenols								
Phenol	ug/l	46	9	<D.L	50.00	50.00	50.00	50.00
VOCs / SVOCs								
Aniline	ug/l		9	0	14.00	0.50	2.78	9.76
Benzyl Alcohol	ug/l		9	0	12.00	0.50	2.19	7.74
Di-n-butylphthalate	ug/l		9	0	5.00	0.50	1.21	3.38
Dimethylphthalate	ug/l		9	0	5.00	0.50	1.44	3.77

APPENDIX 5.5

GROUNDWATER

PROJECT:		GROUNDWATER, WATERS EDGE, WHITEHAVEN					
REF.		8190					
Determinand	Units	Assessment Value (AV)	No. Samples	Samples Exceeding AV	Max	Min	Mean
Hardness	mg/l		4	0	765.00	344.00	525.25
HUMAN HEALTH							
Arsenic	ug/l	50	4	0	9.20	0.82	4.73
Boron (water soluble)	ug/l	1000	4	0	230.00	34.00	95.00
Cadmium	ug/l	1.5	4	0	1.40	0.02	0.38
Chromium III	ug/l	32	4	0	1.90	0.13	0.62
Copper	ug/l	1	4	4	18.00	3.20	9.08
Lead	ug/l	14	4	0	2.60	0.05	0.68
Mercury	ug/l	0.07	4	0	0.02	0.01	0.01
Nickel	ug/l	34	4	1	100.00	4.70	33.68
Selenium	ug/l	10	4	2	26.00	7.20	13.38
Zinc	ug/l	10.9	4	2	60.00	4.80	31.90
Inorganics							
pH	pH		4	0	9.50	6.50	8.08
Cyanide Total	ug/l	5	4	<D.L	20.00	20.00	20.00
Sulphate Aqueous Extract as SO4	mg/l	250	4	4	1100.00	350.00	670.00
Sulphur (free)		32	0	0	0.00	0.00	-
Total Sulphate as SO4		50	0	0	0.00	0.00	-
Petroleum Hydrocarbons							
Aliphatic C5-C6	ug/l	10	4	0	0.05	0.05	0.05
Aliphatic C6-C8	ug/l	10	4	0	0.05	0.05	0.05
Aliphatic C8-C10	ug/l	10	4	0	0.05	0.05	0.05
Aliphatic C10-C12	ug/l	10	4	0	0.50	0.50	0.50
Aliphatic C12-C16	ug/l	10	4	0	0.50	0.50	0.50
Aliphatic C16-C21	ug/l	10	4	0	0.50	0.50	0.50
Aliphatic C21-C35	ug/l	10	4	0	0.50	0.50	0.50
Aliphatic C5-C35	ug/l		4		5.00	5.00	5.00
Aromatic C5-C7	ug/l	10	4	0	0.05	0.05	0.05
Aromatic C7-C8	ug/l	10	4	0	0.05	0.05	0.05
Aromatic C8-C10	ug/l	10	4	0	0.05	0.05	0.05
Aromatic C10-C12	ug/l	10	4	0	0.50	0.50	0.50
Aromatic C12-C16	ug/l	10	4	0	0.50	0.50	0.50
Aromatic C16-C21	ug/l	10	4	0	0.50	0.50	0.50
Aromatic C21-C35	ug/l	10	4	0	0.50	0.50	0.50
Aromatic C5-C35	ug/l	10	4	0	5.00	5.00	5.00
TPH Ali/Aro	ug/l		4		5.00	5.00	5.00
Benzene	ug/l	50	4	0	0.50	0.50	0.50
Toluene	ug/l	380	4	0	0.50	0.50	0.50
PAHs							
Naphthalene	ug/l	130	4	0	5.5000	0.0250	2.4063
Anthracene	ug/l	0.1	4	3	2.9000	0.0050	1.0363
Fluoranthene	ug/l	0.12	4	3	28.0000	0.0200	8.8800
Benzo(b)fluoranthene	ug/l	0.017	4	3	31.0000	0.0050	8.8038
Benzo(k)fluoranthene	ug/l	0.017	4	3	9.8000	0.0050	2.9013
Benzo(a)pyrene	ug/l	0.27	4	3	24.0000	0.0050	6.8338
Indeno(1,2,3-c,d)pyrene	ug/l	0.00017	4	4	19.0000	0.0050	5.3513
Benzo(g,h,i)perylene	ug/l	0.0082	4	3	16.0000	0.0050	4.5163
PAH	ug/l	0.1	4	3	220.0000	0.1000	68.8500
Phenols							
Phenol	ug/l	46	4	<D.L	50.00	50.00	50.00
VOCs / SVOCs							
Aniline	ug/l		4	0	0.50	0.50	0.50
Benzyl Alcohol	ug/l		4	0	0.50	0.50	0.50
Di-n-butylphthalate	ug/l		4	0	0.50	0.50	0.50
Dimethylphthalate	ug/l		4	0	0.50	0.50	0.50

APPENDIX 6

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

APPENDIX 6.1

SOILS

GENERIC ASSESSMENT CRITERIA - SOIL

Site Name	Waters Edge, Whitehaven		
Project Number	8190		
Development Type	Residential with Gardens	Soil Organic Matter %	1
Human Health			
Determinand	Assessment Level	Unit	Source
Inorganic Arsenic	37	mg/kg	S4ULs (LQM)
Beryllium	1.7	mg/kg	S4ULs (LQM)
Boron	290	mg/kg	S4ULs (LQM)
Cadmium	11	mg/kg	S4ULs (LQM)
Chromium III	910	mg/kg	S4ULs (LQM)
Chromium VI	6	mg/kg	S4ULs (LQM)
Copper	2400	mg/kg	S4ULs (LQM)
Elemental Mercury	1.2	mg/kg	S4ULs (LQM)
Inorganic Mercury	40	mg/kg	S4ULs (LQM)
Methylmercury	11	mg/kg	S4ULs (LQM)
Nickel	180	mg/kg	S4ULs (LQM)
Selenium	250	mg/kg	S4ULs (LQM)
Vanadium	410	mg/kg	S4ULs (LQM)
Zinc	3700	mg/kg	S4ULs (LQM)
Lead	200	mg/kg	C4SLs
Inorganic Cyanide	26.8	mg/kg	CLEA 1.06
Benzene	0.087	mg/kg	S4ULs (LQM)
Toluene	130	mg/kg	S4ULs (LQM)
Ethylbenzene	47	mg/kg	S4ULs (LQM)
o-Xylenes	60	mg/kg	S4ULs (LQM)
m-Xylenes	59	mg/kg	S4ULs (LQM)
p-Xylenes	56	mg/kg	S4ULs (LQM)
Aliphatic EC 5-6	42	mg/kg	S4ULs (LQM)
Aliphatic EC >6-8	100	mg/kg	S4ULs (LQM)
Aliphatic EC >8-10	27	mg/kg	S4ULs (LQM)
Aliphatic EC >10-12	130vap(48)	mg/kg	S4ULs (LQM)
Aliphatic EC >12-16	1100sol(24)	mg/kg	S4ULs (LQM)
Aliphatic EC >16-35	65000sol(8.48)	mg/kg	S4ULs (LQM)
Aliphatic EC >35-44	65000sol(8.48)	mg/kg	S4ULs (LQM)
Aromatic EC 5-7 (benzene)	70	mg/kg	S4ULs (LQM)
Aromatic EC >7-8 (toluene)	130	mg/kg	S4ULs (LQM)
Aromatic EC >8-10	34	mg/kg	S4ULs (LQM)
Aromatic EC >10-12	74	mg/kg	S4ULs (LQM)
Aromatic EC >12-16	140	mg/kg	S4ULs (LQM)
Aromatic EC >16-21	260	mg/kg	S4ULs (LQM)
Aromatic EC >21-35	1100	mg/kg	S4ULs (LQM)
Aromatic EC >35-44	1100	mg/kg	S4ULs (LQM)
Aliphatic + Aromatic EC <44-70	1600	mg/kg	S4ULs (LQM)
Acenaphthene	210	mg/kg	S4ULs (LQM)
Acenaphthylene	170	mg/kg	S4ULs (LQM)
Anthracene	2400	mg/kg	S4ULs (LQM)
Benz(a)anthracene	7.2	mg/kg	S4ULs (LQM)
Benzo(a)pyrene	2.2	mg/kg	S4ULs (LQM)
Benzo(b)fluoranthene	2.6	mg/kg	S4ULs (LQM)
Benzo(ghi)perylene	320	mg/kg	S4ULs (LQM)
Benzo(k)fluoranthene	77	mg/kg	S4ULs (LQM)
Chrysene	15	mg/kg	S4ULs (LQM)
Dibenz(ah)anthracene	0.24	mg/kg	S4ULs (LQM)
Fluoranthene	280	mg/kg	S4ULs (LQM)
Fluorene	170	mg/kg	S4ULs (LQM)
Indeno(123-cd)pyrene	27	mg/kg	S4ULs (LQM)
Naphthalene	2.3	mg/kg	S4ULs (LQM)
Phenanthrene	95	mg/kg	S4ULs (LQM)
Pyrene	620	mg/kg	S4ULs (LQM)
Phenol	120	mg/kg	S4ULs (LQM)
Plants			
Determinand	Assessment Level	Unit	Source
Copper	600	mg/kg	Dickinson et al
Nickel	250	mg/kg	Dickinson et al
Zinc	3000	mg/kg	Dickinson et al
Boron	30	mg/kg	Dickinson et al
Cadmium	15	mg/kg	Dickinson et al
Chromium VI	600	mg/kg	Dickinson et al
Total Chromium	1000	mg/kg	Dickinson et al
Mercury	20	mg/kg	Dickinson et al
Lead	2000	mg/kg	Dickinson et al
Arsenic	80	mg/kg	Dickinson et al
Cobalt	240	mg/kg	Dickinson et al
Molybdenum	200	mg/kg	Dickinson et al
Selenium	50	mg/kg	Dickinson et al
Buildings and Services			
Determinand	Assessment Level	Unit	Source
pH	<5		BRE SD1:2005
Sulphate 2:1 water/soil leachate	500	mg/l	BRE SD1:2005
Chloride	100	mg/kg	WRc Environment 1987 PRD 1452M/1

GENERIC ASSESSMENT CRITERIA - SOIL

Site Name	Waters Edge, Whitehaven		
Project Number	8190		
Development Type	Residential with Gardens	Soil Organic Matter %	2.5
Human Health			
Determinand	Assessment Level	Unit	Source
Inorganic Arsenic	37	mg/kg	S4ULs (LQM)
Beryllium	1.7	mg/kg	S4ULs (LQM)
Boron	290	mg/kg	S4ULs (LQM)
Cadmium	11	mg/kg	S4ULs (LQM)
Chromium III	910	mg/kg	S4ULs (LQM)
Chromium VI	6	mg/kg	S4ULs (LQM)
Copper	2400	mg/kg	S4ULs (LQM)
Elemental Mercury	1.2	mg/kg	S4ULs (LQM)
Inorganic Mercury	40	mg/kg	S4ULs (LQM)
Methylmercury	11	mg/kg	S4ULs (LQM)
Nickel	180	mg/kg	S4ULs (LQM)
Selenium	250	mg/kg	S4ULs (LQM)
Vanadium	410	mg/kg	S4ULs (LQM)
Zinc	3700	mg/kg	S4ULs (LQM)
Lead	200	mg/kg	C4SLs
Inorganic Cyanide	26.8	mg/kg	CLEA 1.06
Benzene	0.17	mg/kg	S4ULs (LQM)
Toluene	290	mg/kg	S4ULs (LQM)
Ethylbenzene	110	mg/kg	S4ULs (LQM)
o-Xylenes	140	mg/kg	S4ULs (LQM)
m-Xylenes	140	mg/kg	S4ULs (LQM)
p-Xylenes	130	mg/kg	S4ULs (LQM)
Aliphatic EC 5-6	78	mg/kg	S4ULs (LQM)
Aliphatic EC >6-8	230	mg/kg	S4ULs (LQM)
Aliphatic EC >8-10	65	mg/kg	S4ULs (LQM)
Aliphatic EC >10-12	330vap(118)	mg/kg	S4ULs (LQM)
Aliphatic EC >12-16	2400sol(59)	mg/kg	S4ULs (LQM)
Aliphatic EC >16-35	92000sol(21)	mg/kg	S4ULs (LQM)
Aliphatic EC >35-44	92000sol(21)	mg/kg	S4ULs (LQM)
Aromatic EC 5-7 (benzene)	140	mg/kg	S4ULs (LQM)
Aromatic EC >7-8 (toluene)	290	mg/kg	S4ULs (LQM)
Aromatic EC >8-10	83	mg/kg	S4ULs (LQM)
Aromatic EC >10-12	180	mg/kg	S4ULs (LQM)
Aromatic EC >12-16	330	mg/kg	S4ULs (LQM)
Aromatic EC >16-21	540	mg/kg	S4ULs (LQM)
Aromatic EC >21-35	1500	mg/kg	S4ULs (LQM)
Aromatic EC >35-44	1500	mg/kg	S4ULs (LQM)
Aliphatic + Aromatic EC <44-70	1800	mg/kg	S4ULs (LQM)
Acenaphthene	510	mg/kg	S4ULs (LQM)
Acenaphthylene	420	mg/kg	S4ULs (LQM)
Anthracene	5400	mg/kg	S4ULs (LQM)
Benz(a)anthracene	11	mg/kg	S4ULs (LQM)
Benzo(a)pyrene	2.7	mg/kg	S4ULs (LQM)
Benzo(b)fluoranthene	3.3	mg/kg	S4ULs (LQM)
Benzo(ghi)perylene	340	mg/kg	S4ULs (LQM)
Benzo(k)fluoranthene	93	mg/kg	S4ULs (LQM)
Chrysene	22	mg/kg	S4ULs (LQM)
Dibenz(ah)anthracene	0.28	mg/kg	S4ULs (LQM)
Fluoranthene	560	mg/kg	S4ULs (LQM)
Fluorene	400	mg/kg	S4ULs (LQM)
Indeno(123-cd)pyrene	36	mg/kg	S4ULs (LQM)
Naphthalene	5.6	mg/kg	S4ULs (LQM)
Phenanthrene	220	mg/kg	S4ULs (LQM)
Pyrene	1200	mg/kg	S4ULs (LQM)
Phenol	200	mg/kg	S4ULs (LQM)
Plants			
Determinand	Assessment Level	Unit	Source
Copper	600	mg/kg	Dickinson et al
Nickel	250	mg/kg	Dickinson et al
Zinc	3000	mg/kg	Dickinson et al
Boron	30	mg/kg	Dickinson et al
Cadmium	15	mg/kg	Dickinson et al
Chromium VI	600	mg/kg	Dickinson et al
Total Chromium	1000	mg/kg	Dickinson et al
Mercury	20	mg/kg	Dickinson et al
Lead	2000	mg/kg	Dickinson et al
Arsenic	80	mg/kg	Dickinson et al
Cobalt	240	mg/kg	Dickinson et al
Molybdenum	200	mg/kg	Dickinson et al
Selenium	50	mg/kg	Dickinson et al
Buildings and Services			
Determinand	Assessment Level	Unit	Source
pH	<5		BRE SD1:2005
Sulphate 2:1 water/soil leachate	500	mg/l	BRE SD1:2005
Chloride	100	mg/kg	WRc Environment 1987 PRD 1452M/1

GENERIC ASSESSMENT CRITERIA - SOIL

Site Name	Waters Edge, Whitehaven		
Project Number	8190		
Development Type	Residential with Gardens	Soil Organic Matter %	6
Human Health			
Determinand	Assessment Level	Unit	Source
Inorganic Arsenic	37	mg/kg	S4ULs (LQM)
Beryllium	1.7	mg/kg	S4ULs (LQM)
Boron	290	mg/kg	S4ULs (LQM)
Cadmium	11	mg/kg	S4ULs (LQM)
Chromium III	910	mg/kg	S4ULs (LQM)
Chromium VI	6	mg/kg	S4ULs (LQM)
Copper	2400	mg/kg	S4ULs (LQM)
Elemental Mercury	1.2	mg/kg	S4ULs (LQM)
Inorganic Mercury	40	mg/kg	S4ULs (LQM)
Methylmercury	11	mg/kg	S4ULs (LQM)
Nickel	180	mg/kg	S4ULs (LQM)
Selenium	250	mg/kg	S4ULs (LQM)
Vanadium	410	mg/kg	S4ULs (LQM)
Zinc	3700	mg/kg	S4ULs (LQM)
Lead	200	mg/kg	C4SLs
Inorganic Cyanide	26.8	mg/kg	CLEA 1.06
Benzene	0.37	mg/kg	S4ULs (LQM)
Toluene	660	mg/kg	S4ULs (LQM)
Ethylbenzene	260	mg/kg	S4ULs (LQM)
o-Xylenes	330	mg/kg	S4ULs (LQM)
m-Xylenes	320	mg/kg	S4ULs (LQM)
p-Xylenes	310	mg/kg	S4ULs (LQM)
Aliphatic EC 5-6	160	mg/kg	S4ULs (LQM)
Aliphatic EC >6-8	530	mg/kg	S4ULs (LQM)
Aliphatic EC >8-10	150	mg/kg	S4ULs (LQM)
Aliphatic EC >10-12	760vap(283)	mg/kg	S4ULs (LQM)
Aliphatic EC >12-16	4300sol(142)	mg/kg	S4ULs (LQM)
Aliphatic EC >16-35	110000	mg/kg	S4ULs (LQM)
Aliphatic EC >35-44	110000	mg/kg	S4ULs (LQM)
Aromatic EC 5-7 (benzene)	300	mg/kg	S4ULs (LQM)
Aromatic EC >7-8 (toluene)	660	mg/kg	S4ULs (LQM)
Aromatic EC >8-10	190	mg/kg	S4ULs (LQM)
Aromatic EC >10-12	380	mg/kg	S4ULs (LQM)
Aromatic EC >12-16	660	mg/kg	S4ULs (LQM)
Aromatic EC >16-21	930	mg/kg	S4ULs (LQM)
Aromatic EC >21-35	1700	mg/kg	S4ULs (LQM)
Aromatic EC >35-44	1700	mg/kg	S4ULs (LQM)
Aliphatic + Aromatic EC <44-70	1900	mg/kg	S4ULs (LQM)
Acenaphthene	1100	mg/kg	S4ULs (LQM)
Acenaphthylene	920	mg/kg	S4ULs (LQM)
Anthracene	11000	mg/kg	S4ULs (LQM)
Benz(a)anthracene	13	mg/kg	S4ULs (LQM)
Benzo(a)pyrene	3	mg/kg	S4ULs (LQM)
Benzo(b)fluoranthene	3.7	mg/kg	S4ULs (LQM)
Benzo(ghi)perylene	350	mg/kg	S4ULs (LQM)
Benzo(k)fluoranthene	100	mg/kg	S4ULs (LQM)
Chrysene	27	mg/kg	S4ULs (LQM)
Dibenz(ah)anthracene	0.3	mg/kg	S4ULs (LQM)
Fluoranthene	890	mg/kg	S4ULs (LQM)
Fluorene	860	mg/kg	S4ULs (LQM)
Indeno(123-cd)pyrene	41	mg/kg	S4ULs (LQM)
Naphthalene	13	mg/kg	S4ULs (LQM)
Phenanthrene	440	mg/kg	S4ULs (LQM)
Pyrene	2000	mg/kg	S4ULs (LQM)
Phenol	380	mg/kg	S4ULs (LQM)
Plants			
Determinand	Assessment Level	Unit	Source
Copper	600	mg/kg	Dickinson et al
Nickel	250	mg/kg	Dickinson et al
Zinc	3000	mg/kg	Dickinson et al
Boron	30	mg/kg	Dickinson et al
Cadmium	15	mg/kg	Dickinson et al
Chromium VI	600	mg/kg	Dickinson et al
Total Chromium	1000	mg/kg	Dickinson et al
Mercury	20	mg/kg	Dickinson et al
Lead	2000	mg/kg	Dickinson et al
Arsenic	80	mg/kg	Dickinson et al
Cobalt	240	mg/kg	Dickinson et al
Molybdenum	200	mg/kg	Dickinson et al
Selenium	50	mg/kg	Dickinson et al
Buildings and Services			
Determinand	Assessment Level	Unit	Source
pH	<5		BRE SD1:2005
Sulphate 2:1 water/soil leachate	500	mg/l	BRE SD1:2005
Chloride	100	mg/kg	WRc Environment 1987 PRD 1452M/1

APPENDIX 6.2

LEACHATE / GROUNDWATER

GROUNDWATER ASSESSMENT CRITERIA

Determinands	Unit	Quality Standard	Hazardous / Non-Hazardous	Provenance	
Inorganics					
pH		> /= 6.5 and < /= 9.5			UK DWS
Conductivity		2500 uS/cm at 20°C			UK DWS
Alkalinity					
Cyanide	µg/l	1		AA	UK WFD
Cyanide	µg/l	5		MAC	UK WFD
Cyanide	µg/l	50		--	UK DWS
Chloride	mg/l	250	N-H	--	UK DWS
Sulphate	mg/l	250	N-H	--	UK DWS
Metals					
Aluminium	µg/l	200		--	UK DWS
Antimony	µg/l	5	N-H	--	UK DWS
Arsenic	µg/l	50	H		UK WFD
Arsenic	µg/l	10	H	--	UK DWS
Barium	µg/l	700	N-H		WHO DWG
Boron	µg/l	1000		--	UK DWS
Cadmium <40mg/l hardness	µg/l	<0.08	N-H	AA	UK WFD
Cadmium 40-50mg/l hardness	µg/l	0.08	N-H	AA	UK WFD
Cadmium 50-100mg/l hardness	µg/l	0.09	N-H	AA	UK WFD
Cadmium 100-200mg/l hardness	µg/l	0.15	N-H	AA	UK WFD
Cadmium >200mg/l hardness	µg/l	0.25	N-H	AA	UK WFD
Cadmium <40mg/l hardness	µg/l	<0.45	N-H	MAC	UK WFD
Cadmium 40-50mg/l hardness	µg/l	0.45	N-H	MAC	UK WFD
Cadmium 50-100mg/l hardness	µg/l	0.6	N-H	MAC	UK WFD
Cadmium 100-200mg/l hardness	µg/l	0.9	N-H	MAC	UK WFD
Cadmium >200mg/l hardness	µg/l	1.5	N-H	MAC	UK WFD
Cadmium	µg/l	5	N-H	--	UK DWS
Calcium	mg/l	250			UK DWS
Chromium VI	µg/l	3.4	H	AA	UK WFD
Chromium III	µg/l	4.7	N-H	AA	UK WFD
Chromium III	µg/l	32	N-H	MAC	UK WFD
Chromium III	µg/l	50	N-H	--	UK DWS
Cobalt	µg/l	100			76/464/EEC
Copper	µg/l	1	N-H	AA	UK WFD
Copper	µg/l	2000	N-H	--	UK DWS
Ferric Iron (FE 3+)					
Iron (total)	µg/l	1000		AA	UK WFD
Iron (total)	µg/l	200		--	UK DWS
Lead	µg/l	1.2		AA	UK WFD
Lead	µg/l	14		MAC	UK WFD
Lead	µg/l	10		--	UK DWS
Magnesium	mg/l	50			UK DWS
Manganese	µg/l	123		AA	UK WFD
Manganese	µg/l	50		--	UK DWS
Mercury	µg/l	1	H	--	UK DWS
Mercury	µg/l	0.07		MAC	UK WFD
Molybdenum	µg/l	70	N-H	--	WHO DWG
Nickel	µg/l	4	N-H	AA	UK WFD

Nickel	µg/l	34	N-H	MAC	UK WFD
Nickel	µg/l	20	N-H	--	UK DWS
Phosphorus	µg/l	2200			UK DWS
Potassium	mg/l	12			UK DWS
Selenium	µg/l	10	N-H	--	UK DWS
Sodium	mg/l	200		--	UK DWS
Vanadium	µg/l	20 µg/l			76/464/EEC
Zinc	µg/l	10.9	N-H	AA	UK WFD
Zinc	µg/l	3000	N-H	--	WHO DWG
Hydrocarbons					
Total TPH	µg/l	10			UK DWS
Benzene	µg/l	10		AA	UK DWS
Benzene	µg/l	50		MAC	UK DWS
Benzene	µg/l	1		--	UK DWS
Toluene	µg/l	74		AA	UK WFD
Toluene	µg/l	380		MAC	UK WFD
Phenol	µg/l	7.7		AA	UK WFD
Phenol	µg/l	46		MAC	UK WFD
PAHs					
Speciated PAH	µg/l	0.1		--	UK DWS
Anthracene	µg/l	0.1		AA / MAC	UK WFD
Benzo(a)pyrene	µg/l	0.00017		AA	UK WFD
Benzo(a)pyrene	µg/l	0.27		MAC	UK WFD
Benzo(a)pyrene	µg/l	0.01		--	UK DWS
Benzo(b)fluoranthene	µg/l	0.017		MAC	UK WFD based off Benzo(a)pyrene as marker
Benzo(k)fluoranthene	µg/l	0.017		MAC	UK WFD based off Benzo(a)pyrene as marker
Benzo(ghi)perylene	µg/l	0.0082		MAC	UK WFD based off Benzo(a)pyrene as marker
Indeno(123-cd)pyrene	µg/l	0.00017		AA	UK WFD based off Benzo(a)pyrene as marker
Fluoranthene	µg/l			AA	UK WFD
Fluoranthene	µg/l	0.12		MAC	UK WFD
Naphthalene	µg/l	2		AA	UK WFD
Naphthalene	µg/l	130		MAC	UK WFD
VOC / SVOCs					
1,2-dichloro-ethane	µg/l	3		--	UK DWS
Aclonifen	µg/l	0.12		AA / MAC	UK WFD
Alachlor	µg/l	0.3		AA	UK WFD
Alachlor	µg/l	0.7		MAC	UK WFD
Aldrin	µg/l	0.03		--	UK DWS
Atrazine	µg/l	0.6		AA	UK WFD
Atrazine	µg/l	2		MAC	UK WFD
Bifenox (Methyl 5-(2,4-dichlorophenoxy)-2-nitrobenzoate)	µg/l	0.012		AA	UK WFD
Bifenox (Methyl 5-(2,4-dichlorophenoxy)-2-nitrobenzoate)	µg/l	0.04		MAC	UK WFD

Brominated diphenylether - total PBDE (or congener) numbers 28, 47, 99, 100, 153 and 154	µg/l	0.14	MAC	UK WFD
C10-13 chloroalkanes	µg/l	0.4	AA	UK WFD
C10-13 chloroalkanes	µg/l	1.4	MAC	UK WFD
Carbon tetrachloride	µg/l	12	AA	UK WFD
Chlorfenvinphos	µg/l	0.1	AA	UK WFD
Chlorfenvinphos	µg/l	0.3	MAC	UK WFD
Chlorpyrifos (chlorpyrifos-ethyl)	µg/l	0.03	AA	UK WFD
Chlorpyrifos (chlorpyrifos-ethyl)	µg/l	0.1	MAC	UK WFD
Cybutryne	µg/l	0.0025	AA	UK WFD
Cybutryne	µg/l	0.016	MAC	UK WFD
Cyclodiene pesticides - total aldrin, dieldrin, endrin and isodrin	µg/l	0.01	AA	UK WFD
Cypermethrin	µg/l	0.00008	AA	UK WFD
Cypermethrin	µg/l	0.0006	MAC	UK WFD
DDT total	µg/l	0.025	Not applicable	UK WFD
Di(2-ethylhexyl)-phthalate (DEHP)	µg/l	1.3	AA	UK WFD
Dichloro-methane	µg/l	20	AA	UK WFD
Dichlorvos	µg/l	0.0006	AA	UK WFD
Dichlorvos	µg/l	0.0007	MAC	UK WFD
Dieldrin	µg/l	0.03	--	UK DWS
Dicofol	µg/l	0.0013	AA	UK WFD
Dioxins and dioxin-like compounds	µg/l	Not applicable	Not applicable	UK WFD
Diuron	µg/l	0.2	1.8	
Endosulphan	µg/l	0.005	AA	UK WFD
Endosulphan	µg/l	0.01	MAC	UK WFD
Heptachlor & heptachlor epoxide	µg/l	0.0000002	AA	UK WFD
Heptachlor & heptachlor epoxide	µg/l	0.0003	MAC	UK WFD
Heptachlor & heptachlor epoxide	µg/l	0.03	--	UK DWS
Hexabromocyclo-dodecane (HBCDD)	µg/l	0.0016	AA	UK WFD
Hexabromocyclo-dodecane (HBCDD)	µg/l	0.5	MAC	UK WFD
Hexachloro-benzene	µg/l	0.05	MAC	UK WFD
Hexachloro-butadiene	µg/l	0.6	MAC	UK WFD
Hexachloro-cyclohexane	µg/l	0.02	AA	UK WFD
Hexachloro-cyclohexane	µg/l	0.04	MAC	UK WFD
Isoproturon	µg/l	0.3	AA	UK WFD
Isoproturon	µg/l	1	MAC	UK WFD
Nonylphenol (4-nonylphenol)	µg/l	0.3	AA	UK WFD
Nonylphenol (4-nonylphenol)	µg/l	2	MAC	UK WFD
Octylphenol (4-(1,1',3,3'-tetramethyl-butyl)-phenol)	µg/l	0.1	AA	UK WFD
Para-para-DDT	µg/l	0.01	Not applicable	
Pentachloro-benzene	µg/l	0.007	AA	UK WFD

Pentachloro-phenol	µg/l	0.4		AA	UK WFD
Pentachloro-phenol	µg/l	1		MAC	UK WFD
Perfluorooctane sulfonic acid and its salts (PFOS)	µg/l	0.00065		AA	UK WFD
Perfluorooctane sulfonic acid and its salts (PFOS)	µg/l	36		MAC	UK WFD
Pesticides total	µg/l	0.5		--	UK DWS
Quinoxifen	µg/l	0.15		AA	UK WFD
Quinoxifen	µg/l	2.7		MAC	UK WFD
Simazine	µg/l	1		AA	UK WFD
Simazine	µg/l	4		MAC	UK WFD
Terbutryn	µg/l	0.062		AA	UK WFD
Terbutryn	µg/l	0.34		MAC	UK WFD
Tetrachloro-ethylene	µg/l	10		AA	UK WFD
Tetrachloro-ethylene	µg/l	0.5		--	UK DWS
Tributyltin compounds (tributyltin-cation)	µg/l	0.0002		AA	UK WFD
Tributyltin compounds (tributyltin-cation)	µg/l	0.0015		MAC	UK WFD
Trichloro-benzenes	µg/l	0.4		AA	UK WFD
Trichloro-ethylene	µg/l	10		AA	UK WFD
Trichloro-ethylene	µg/l	0.5		--	UK DWS
Trichloro-methane (chloroform)	µg/l	2.5		AA	UK WFD
Trifluralin	µg/l	0.03		AA	UK WFD
Vinyl chloride	µg/l	0.5		--	UK DWS

APPENDIX 7

PRINCIPALS OF ENVIRONMENTAL 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 8

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.