

VERIFICATION REPORT
on
DEEP DRILLING
at
THE SITE
of
THE OLD PAGE SCHOOL, PAGE ROAD,
STAPLE HILL, BRISTOL

on behalf of

SOUTH GLOUCESTERSHIRE COUNCIL.

REPORT No: 2021/1100 FEBRUARY 2021

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1.0 INTRODUCTION

1.1 TERMS OF REFERENCE

This report describes the boring, sampling and inspections of the site known as 'land at rear of 30 High Street', Staple Hill which has been completed in accordance with instructions received from The Client.

The purpose of this work was to provide a verification of the sub soil and underlying rocks as set out in the attached permit from the Coal Authority. [CA]. This follows a condition placed on the planning consent from South Gloucestershire Council [SGC] for the development of a pair of semi-detached lightweight houses.

The work and the report were to provide evidence of solid rock beneath the proposed site to ensure that it was not affected by any historic coal deposits or coal related legacies.

This work was to be linked with a similar investigation for South Gloucestershire Council on their Page Rd site some 150m away.

1.2 DEVELOPMENT PROPOSALS

The development proposals are defined under the consent from SGC number P19/13190/O dated 27th September 2019. This condition relates to the construction of two semi-detached lightweight houses for private occupation.

The investigation has been undertaken with the objective of removing the possibility of there being any coal/coal legacies under the site itself and the general area, and to further assist SGC in the evaluation of their site.

The development area will be confined to the section hatched in red and away from the conjectured possible coal legacies.

A Permit for these works has been granted by the CA and is appended to this report.

1.3 OBJECTIVES

The main aims of the present work have been to:

- Complete the boring of boreholes by open hole water flush drilling to the depth the standard CA requirements and those of this firm.
- To monitor the work as it proceeded and to note any voids/abnormalities/broken strata/ground gas during the drilling process.
- To install a gas monitoring installation for on-going monitoring as might be required.

It has been agreed that these boreholes would be drilled and used to enhance the knowledge of both sites and the conjectured features.

2.0 SITE DETAILS

2.1 LOCATION AND DESCRIPTION

The site is located within an area adjacent to The High Street, Staple Hill, Bristol.

The borehole locations for both sections of this work are shown on the appended plans.

Details of the potential coal/coal legacies are set out in the original SGC report. This work concluded that there was a high degree of certainty that the coal legacies were not on or adjacent to the Page Road school site but located to the North of the site.

A detailed inspection of a range of adjacent properties along the High Street has concluded that they were not the subject of any distress likely to be caused by coal or coal related activity.

2.2 GEOLOGY

The details of the geology and conjectured legacies are not repeated in this report (being the same as the Page Road site for SGC).

In essence it was thought from previous experience that this site was likely to be underlain at depth by sandstones with some possible inclusions of mudstone.

The site was not considered to be the subject of possible high-level seams and legacies from historic localised workings.

3. INVESTIGATION. [Open Hole Drilling]

3.1 FIELDWORK

The plan appended to this report indicates the approximate positions of the boreholes constructed during this investigation on both sites.

It should be noted that the Page Street site will be reported separately under its own CA Permit.

Prior to boring their positions were scanned using a Cable Avoidance Tool.

A rubber tracked Comacchio Drilling Rig was used to bore the holes by the water flush rotary open hole drilling.

This was facilitated by drilling in casing to seal any localised overburden/clays.

The drilling was carried under the supervision of this firm.

A borehole on each site was to be drilled and terminated at 30m below the level of the original ground. If a continuous thickness of solid rock [likely to be mudstones and or sandstones] was found on each site, then remaining boreholes would be drilled to a depth considered sufficient to provide the information required.

3.2 Gas Monitoring. [SHOULD IT BE REQUIRED]

Checks were made throughout the drilling process for any ground/mine gas at the well head. In addition, gas monitoring installations [as required] were to be constructed and observations were continued for a further seven days following the completion of the borehole. Further monitoring was programmed for a period of 4 months into a period of lower atmospheric pressures.

4.0 GROUND CONDITIONS

4.1 GENERAL

The insitu rock as found was as expected from previous work in the area and from the study of the geological maps of the area.

4.2 MADE GROUND

The only made ground on site was a general layer of concrete and normal granular material.-This was removed by way of a trial hole prior to boring operations.

4.3 NATURAL GROUND/ROCK

The natural strata succession revealed by the drilling was one of stiff to very stiff sandy clays transitioning into continuous sandstone formations of varying hardness down to 30m.

Details are appended on the relevant borehole log sheet.

The clays required casing of varying lengths to be drilled in to seal the holes. These depths varied from 2 to 3 m.

Full water returns were obtained during the drilling operations.

5. CONCLUSIONS and RECOMMENDATIONS

5.1 GENERAL CONCLUSIONS

A copy of the Coal Authority's permit for the investigation of this site is appended to this report. Copies of relevant correspondence with the CA are also appended.

The natural material underlying the site has been proven to be as expected from the geological mapping of the area and previous work on this site and in the locality.

The localised coal legacy conditions conjectured to be present some 200m east of this site do not exist. From this work and that of the work at Page Rd it is considered that they are likely to be to the north of this site.

5.2 SPECIFIC CONCLUSIONS

From this work it is possible to make the following specific conclusions and recommendations.

1. The two holes drilled [one to the full depth] did not indicate or show in the returns any coal or coal related legacies.
2. The rock encountered was [at depth] a sequence of very hard red/grey/buff/brown sandstones/sandy mudstone. Within the overall depth there were thin sections of hard brown mudstone which whilst easier to drill were totally intact as a formation.
3. The drilling records and observations did not reveal any evidence of broken strata, voids, or "soft ground" beyond that sealed by the initial casing sections of the boreholes [some 2/3m]. No coal seams [either intact or worked] were found.
4. No major loss of flushing fluid was experienced, and the water flush each borehole saw a loss of water of between 500 litres and 8000 litres this mainly being

associated with the drilling of the casing. Where solid mudstones were found there was virtually 100% recovery of the flush water.

5. No weaknesses, soft spots, voids, or other imperfections were found or registered within the depths drilled.
6. No evidence either visual or olfactory of any contamination or mine gas was found by the Supervisors, at the time of drilling or on subsequent visits to monitor the wells.
7. There being little made ground present other than topsoil there were no visual or olfactory signs of any hydrocarbon/derivatives or other contaminants.

Georgina Cutler BSc. Hons. FGS.  February 2021.

LOCATION

of

ROTARY PROBE BOREHOLES.

30a, High Street, Staple Hill, South Gloucestershire, BS16 5HW



Site Plan shows area bounded by: 364401.56, 175630.47 364801.56, 176030.47 (at a scale of 1:2500), OSGridRef: ST64607583. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

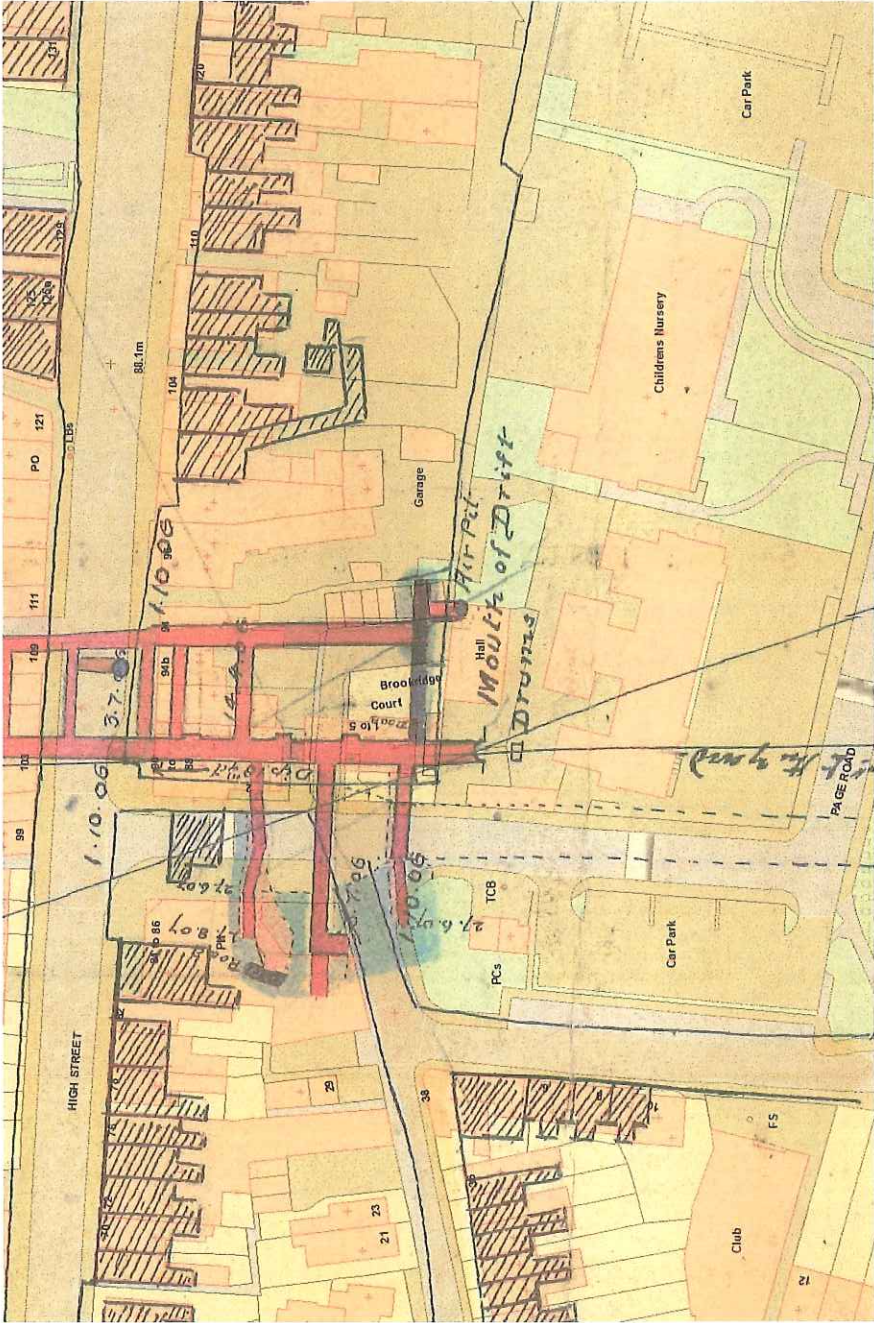
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**CONJECTURED
ABANDONED DRIFT
WORKINGS.**

Map showing a residential area with streets including High Street, Brook Bridge Court, and Page Road. Key features include a 'Mouth of Drift' area, a 'Childrens Nursery', a 'Club', and several 'Car Park' areas. Handwritten annotations include 'Air-Pit', 'HALL', 'MOUTH OF DRIFT', and 'DRUMS'. A red line runs vertically through the center, possibly indicating a boundary or a specific path.



**TRIAL HOLE, WINDOW
SAMPLING
&
ROTARY OPEN HOLE
BOREHOLE LOCATIONS.**

High Street, Staple Hill.

Page Road, Staple Hill.



GEO-TESTING SERVICES

Tel: 0117 9634471

Site
STAPLE HILL, BRISTOL

Borehole
Number
BH1

Machine: COMMACHIO OPEN
HOLE RIG

Flush :

Core Dia: mm

Method : Rotary Cored

Casing Diameter

Ground Level (mOD)

Client
SOUTH GLOUCESTERSHIRE COUNCIL

Job
Number
2021/03

Location

Dates
01/02/2021

Engineer

Sheet
1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.20)	MADE GROUND		
							1.20	Stiff to hard, buff/brown/grey CLAY/weak weathered		
							(1.80)	MUDSTONE		
							3.00	Weak, grey/brown/buff MUDSTONE		
							(9.00)			
							12.00	Hard, brown/grey MUDSTONE becoming harder with depth		
							(18.00)			
							30.00	Complete at 30.00m		

Remarks

Scale
(approx)

1:200

Logged
By

Figure No.
2021/03.BH1



GEO-TESTING SERVICES

Tel: 0117 9634471

Site

STAPLE HILL, BRISTOL

Borehole

Number

BH2

Machine: COMMACHIO OPEN
HOLE RIG

Flush :

Core Dia: mm

Method : Rotary Cored

Casing Diameter

Ground Level (mOD)

Client

SOUTH GLOUCESTERSHIRE COUNCIL

Job

Number

2021/03

Location

Dates

02/02/2021

Engineer

Sheet

1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.00) 1.00	MADE GROUND		
								Weak, buff/grey/brown MUDSTONE		
							(9.00)			
							10.00	Hard, buff/brown/grey MUDSTONE		
							(10.00)			
							20.00	Complete at 20.00m		

Remarks

Scale
(approx)

1:200

Logged
By

Figure No.

2021/03.BH2



GEO-TESTING SERVICES

Tel: 0117 9634471

Site

STAPLE HILL, BRISTOL

Borehole

Number

BH3

Machine: COMMACHIO OPEN
HOLE RIG

Flush :

Core Dia: mm

Method : Rotary Cored

Casing Diameter

Ground Level (mOD)

Client

SOUTH GLOUCESTERSHIRE COUNCIL

Job
Number

2021/03

Location

Dates

03/02/2021

Engineer

Sheet

1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.50)	MADE GROUND		
							1.50	Weak, weathered, buff/brown MUDSTONE		
							(8.50)			
							10.00	Hard, buff/brown/grey MUDSTONE		
							(5.00)			
							15.00	Complete at 15.00m		

Remarks

Scale
(approx)

1:200

Logged
By

Figure No.

2021/03.BH3



GEO-TESTING SERVICES

Tel: 0117 9634471

Site

STAPLE HILL, BRISTOL

Borehole

Number

BH4

Machine: COMMACHIO OPEN
HOLE RIG

Flush :

Core Dia: mm

Method : Rotary Cored

Casing Diameter

Ground Level (mOD)

Client

SOUTH GLOUCESTERSHIRE COUNCIL

Job
Number

2021/03

Location

Dates

04/02/2021

Engineer

Sheet

1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.50)	MADE GROUND / CONCRETE		
							1.50	Hard, red/brown SANDY MUDSTONE		
							(6.50)			
							8.00	Hard to very hard, red SANDSTONE with some layers of hard MUDSTONE		
							(22.00)			
							30.00	Complete at 30.00m		

Remarks

Scale
(approx)

1:200

Logged
By

Figure No.

2021/03.BH4



GEO-TESTING SERVICES

Tel: 0117 9634471

Site

STAPLE HILL, BRISTOL

Borehole

Number

BH5

Machine: COMMACHIO OPEN
HOLE RIG

Flush :

Core Dia: mm

Method : Rotary Cored

Casing Diameter

Ground Level (mOD)

Client

SOUTH GLOUCESTERSHIRE COUNCIL

Job

Number

2021/03

Location

Dates

05/02/2021

Engineer

Sheet

1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.50) 0.50	TOPSOIL		
								Stiff to hard, red/brown SANDY CLAY		
							(4.50)			
							5.00	Hard, red SANDSTONE		
							(10.00)			
							15.00	Complete at 15.00m		

Remarks

Scale
(approx)

1:200

Logged
By

Figure No.

2021/03.BH5

COAL MINING
[MINOR DEVELOPMENT RISK]
REPORT
OCTOBER 2017.



The Coal
Authority

Minor Development Risk Report

For development land at:

Page Road, Staple Hill, Soundwell, Bristol, BS16 4QG

Assessment Summary

Assessment Result	HIGH RISK
Recommended Further Work	INTRUSIVE GROUND INVESTIGATION

The Coal Authority works to resolve the impacts of mining by growing its expertise, innovation, organisational capability and efficiency.

It manages the effects of past coal mining, including subsidence damage claims which are not the responsibility of licensed coal mine operators and is an executive non-departmental public body, sponsored by the Department of Business, Energy and Industrial Strategy. This report is valid for 90 days.

Limit of liability

This report is provided for the applicant and is in respect of the property identified on its face. Any conclusions or recommendations made are those based on information obtained for the report and our current knowledge and practices. The information and data set out in this report is based on information provided by or obtained from third parties which is held by the Coal Authority. Any limitations of the data are identified within the report. The Coal Authority does not accept liability for the accuracy of third party data. Should new data or information become available these results, conclusions and recommendations may require amending. The Authority is not and cannot be liable for any harm, loss or damage of whatever nature, including consequential loss, occasioned to any third party by the inaccuracy of the information set out in this report and any person seeking to rely upon it should if necessary undertake their own investigations and professional advice. The report should only be used in the stated context.

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Any advice provided in this report does not prejudice our position as a statutory consultee.

Version	Compiled	Checked	Date
1.1	LS	SW	25/10/2017

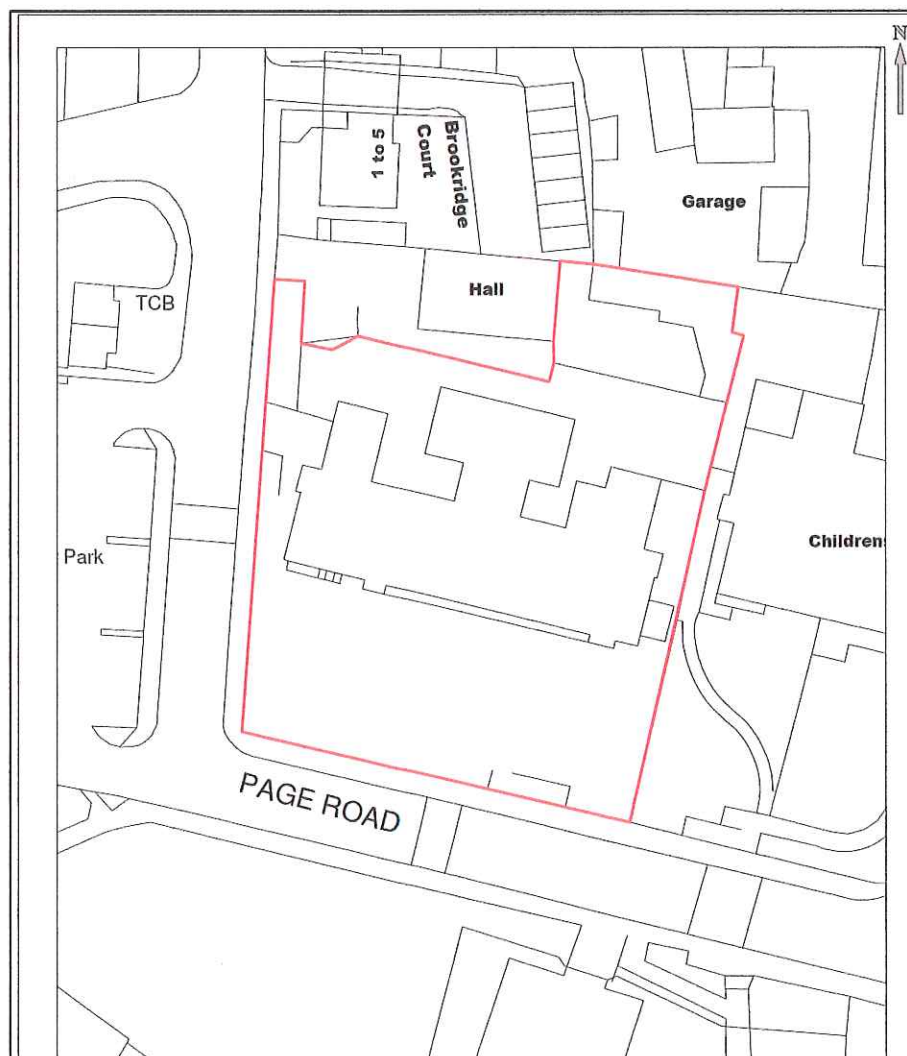
Section 1 – Description of site and proposed development

a) Site location and Description

The Coal Authority has been commissioned to prepare a Coal Mining Risk Assessment Report for a proposed development (see Figure 1), in order to provide the Local Planning Authority with information on coal mining and an assessment of its impact on land stability.

The approximate site centre co-ordinates are 364770E, 175845N. The proposed development area benefits from existing access via Page Road in the north west of the site. The site has an expected elevation close to 87m AOD.

Figure 1. Site location plan.



Description and layout of proposed development

The Coal Authority understands that the developer plans to construct a residential 4 storey apartment block comprising of 32x units with associated parking access and auxiliary facilities (see Appendix A).

b) Scope of coal mining risk assessment

The purpose of this Coal Mining Risk Assessment Report is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site.
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues.
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development.
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

Any works that intersect coal mine workings, mine entries or coal seams may have implications for mine gas, spontaneous combustion and surface collapse. Coal Authority permission is required prior to any such works taking place. Further detailed advice can be provided upon request.

The Coal Authority's adopted policies regarding building over or close to mine entries and managing gas risks can be viewed at:

www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Section 2 – Sources of information used to inform this report

Source reviewed	Yes	No	Remarks
Coal mining report	X		Non-Residential Coal Mining Consultants Report (see Appendix C)
Other mining records	X		Abandonment plans – CA ref. 5309 Staple Hill Colliery, Mine plan ref. 17639.
Historic OS plans		X	
Geological plans	X		BGS Sheet 264 1:50k solid and drift (2004), ST67NW 1:10560 solid and drift (1955).
BGS Boreholes	X		ST67NW10 Pendennis Pit, ST67NW11 Unnamed pit, & ST67NW16 Castles pit.
Other		X	<ul style="list-style-type: none"> • BGS onshore Geoindex, • BGS Lexicon of named rock units, • Geology of the Bristol district: a brief explanation of the geological map 264 - Bristol (2002). • Environmental Geology Study in the Bristol Area, Howard Humphreys & Partners DoE (1987) Maps and sections. • Coal Authority Interactive viewer. • Coal Authority Shaft Register.

The above information sources have been used to provide an assessment of the potential mining risk within the remainder of the report.

Section 3 – Identification and assessment of site specific coal mining related risks

The Coal Authority's search of its detailed coal mining information identifies the following site specific coal mining legacy risks to the site.

Coal mining issue	Yes	No	Risk assessment	
			Rating	Comment
a) Underground coal mining (recorded at shallow depths)	X		Medium risk	Known to exist very close to the northern boundary of the site.
b) Underground coal mining (probable at shallow depths)	X		Medium risk	Confirmed on Mining report.
c) Mine entries (shafts and adits)	X		High risk	Two recorded mine entries beneath or within influencing distance, 1 shaft and 1 adit.
d) Coal mining geology (faults and fissures)		X	Low risk	None recorded
e) Record of past mine gas emissions or potential	X		Medium risk	None recorded, although potential exists in relation to shallow workings
f) Recorded coal mining surface hazard		X	Low risk	None recorded
g) Surface mining (opencast workings)		X	Low risk	None recorded

A desk based study of the coal mining information has been used to risk assess the coal mining features above. A summary of the risk posed by these features is summarised in the table above, after analysis of the information sources by an experienced Coal Authority Mining Engineer. Comment on specific coal mining issue follows below:

a) Underground Coal Mining (recorded at shallow depths)

Coal mining at depths shallower than 30m beneath ground level can typically pose challenges to ground stability at the surface. The magnitude of this effect depends upon the exact depth of any workings, the thickness of competent rock cover and the extraction thickness of any coal mine workings.

The non-residential coal mining consultants report (Ref. 51001663304001) is reproduced in Appendix C. Abandoned mine plan 5309 shows that old workings were encountered and recorded near to both of the mine entries recorded within or close to the sites northern boundary. These workings are expected within the Parrot (or Hen) seam which crops across the site just south of these locations. These old workings are expected to represent a continuation of historic, very shallow crop workings locally, which are also recorded along strike to the west of the site.

Mine workings recorded below the site at c. 29m depth are expected to coincide with exploitation of the next notable seam the Golden Cock or Cuckoo seam. Since this has a recorded extraction thickness of only 0.7m and rock head expected within c. 1.0m of the surface there is more than sufficient competent rock overburden (in the order of 27m) from this seam such that its influence on stability can be ignored. If piled foundations or other solutions necessitated transferring loads to notable depth or deep unexpected made ground / superficial deposits were encountered would this assessment have to be reconsidered.

b) Underground coal mining (probable at shallow depths)

Areas of probable shallow coal mine workings have been identified as part of the Development High Risk Area for which no recorded plan exists, but where it is likely that workable coal at shallow depths has been mined before records were kept. The data has been estimated from available mining records by qualified mining surveyors. Since 1872 there has been a law that requires all coal mine operators to deposit working plans of the mine with the government following the cessation of operations; however, prior to this date the plans were often destroyed or kept in private ownership.

Where the extraction of coal has occurred there is the potential for voids to remain long after mining has ceased. The depth of workings generally dictates the length of time that significant voids may remain, but other factors including the size of mine roof supports and competency of overlying strata can influence the time for natural consolidation to occur. Waste material produced during mining was sometimes used to backfill abandoned sections of mine workings, therefore reducing the volume of open cavities or voids that remain. The method of backfilling workings is typically not recorded and cannot be relied upon as a satisfactory form of remediation.

Further more widespread exploitation of the Parrot (Hen) seam than encountered by the Staple Hill Colliery might reasonably be expected across the central and northern portion of the site. Both the coal and the fireclay below may have been extracted with a potential combined extraction height of 2.18m. The dip of the seam is expected to be in the order of 25-30 degrees to the NNE and extraction may have been possible under small cover thicknesses given the presence of the 'pennant' Downend group beds.

c) Mine entries (shafts and adits)

Two mine entries are recorded within site and 20m of its boundary. The mineshaft is given Coal Authority reference mine entry reference 364175-007 (Staple Hill Colliery air shaft) and the adit (Staple Hill Colliery adit) reference 364175-008 are both shown on Abandonment plan 5309, the present interpretation of their position by the Coal Authority shown plotted on the enquiry boundary plan of the Coal Mining Consultants Report in Appendix C. As a result of the presence of mine entries being potentially within the development site boundary a georeferencing exercise based on plan 5309 has been undertaken to check the expected mine entry locations. This confirmed that the shaft is, based on that source, accurately plotted within the plans inherent accuracy, its centre-point being at OS coordinates 364779.9E, 175873.8N <2.0m from the Coal Authority's best plot position. The mouth of the associated adit 364175-008 was found to plot further north, by some 15m, than the Coal Authority's best plot location, at OS coordinates 364758.5E, 175870.4N. This discrepancy has been referred to the Coal Authority's Information Management Team for comment, in an attempt to have any future search area both agreed and better constrained. The results of the dereferencing exercise can be viewed on the plan included in Appendix B, which combines the relevant extract of plan 5309 overlain present day mapping. Following a response from The Coal Authority's Mining Information team have since responded and confirmed that they agree with the amended position for the adit 364174-008 and their records will duly be updated re-positioning the adit mouth at OS grid reference 364758E, 175871N placing it 3.5m north of the site boundary. Importantly, this means that in due course there will be a correction to the adits position as reported here on the attached Consultants mining report Appendix C.

As a result of historic workings being identified on the Staple Hill Colliery plans it is not unreasonable to expect there to remain a risk of unrecorded mine entries or crop workings including the resulting filled and disturbed ground from affecting the site. All site operatives should be made aware of this potential risk and a watching brief should be maintained during the site works.

d) Coal measure geology (Faults and fissures)

The development site sits upon the Downend Member described in the BGS lexicon as Sandstone with some conglomerate and pebbly sandstone with sporadic fissile mudstone beds and some workable coal seams. The Sandstone is typically a coarse-grained lithic arenite of "Pennant" type, hence its historic reference as Pennant Sandstone or beds. The base of the member is diachronous and in the Bristol Coalfield it occurs above the Cambriense Marine Band. All the strata dip to the NNE at an estimated 24-30 degrees, occupying a position on the northern limb of the Kingswood anticline.

Through the site the published geological plans show one of the major seams within the Downend Member, the Parrot (also synonymous with the Hen seam) cropping through the site along a WNW/ESE strike. The variation in thickness of the Parrot seam across

the Bristol area is recorded on the 2004 geological plan as 0.3-3.0m but from examination of abandonment plan 5309 we know that local to the site the seam attains a thickness of only (2 feet 2 inches) 0.66m. However the seam section records 5 feet of good quality fireclay immediately below the seam, which as a result is highly likely to have been worked simultaneously with the coal.

A second typically unnamed seam is present south of the site as denoted on the 2004 geological plan. This seam is shown to crop beneath the Staple Hill Primary School to the south dipping at a similar expected attitude to the Parrot (Hen) seam. Cross-section plans from the Environmental Geology Study in the Bristol Area (EGSB), sheets E₆, P₁₀ & P₁₁ denote that this unnamed seam may be the Golden Cock or Cuckoo seam. Mine plan 17639 (3 of 9) records workings in a seam between Page Road and the High Street. This is not an abandonment plan, simply an area of workings transferred onto an OS base sheet. Shown in red they are annotated as relating to the Cock Vein/seam. However, at the base of the plan the key denotes the workings shown in red as being associated with the Little Toad Vein/seam. The most likely interpretation is that the unnamed seam on the geological plan is the same as the Golden Cock seam and the workings shown on the mining plan 17639 relate to this seam the annotation being shortened from Golden Cock vein/seam confusingly to just 'Cock vein'. This the latter interpretation avoids conflict with the crops positions on the published geological maps, and abandonment plan 5309 which appears to confirm the exploitation of the Parrot (Hen) seam from the Staple Hill Colliery drift from just north of its published crop position, within or close to the study site.

BGS borehole record ST67NW16 the shaft record from Castles Ridgeway Pit confirms that the vertical interval between the 'true' Cock seam above the Parrot (Hen) seam is in the order of 101 yards (92m). Midway between these seams is the Chick seam which appears uneconomic recorded as only 6inches in thickness. Both the Parrot (Hen) and Cock seam are recorded as 3ft thick on this record.

Superficial deposits consist of natural soil regolith and thin made ground deposits with a typical thickness of 0.5m in the local area, this is supported by EGSB sheet D6 this thickness of made ground reported NE of the site just north of the High Street. Sheet F₆ records rock to be at or close to the surface across the site and a much wider area beyond.

There are no recorded geological faults expected to affect the geology immediately below or surrounding the site. The closest recorded fault is the White Faced Fault situated some 450m west roughly parallel and coincident with Thicket Avenue.

None of the seams mentioned herein appear on the Coal Authority's published list with a known history of spontaneous combustion. It is acknowledged that this list is not neither fully comprehensive or definitive in that regard.

e) Record of past mine gas emissions or potential

There are no recorded past gas emissions recorded in the surrounding area, however disturbed coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development. At development sites with shallow coal workings, probable shallow coal mine workings, or pathway features such as mine entries and geological disturbances on or nearby the site, the Coal Authority recommends that a more detailed gas risk assessment to be undertaken in accordance with relevant guidance.

f) Recorded coal mining surface hazard

None recorded.

g) Surface mining (opencast workings)

None recorded.

Section 4 – Proposed mitigation strategy

a) Site investigation and/or remediation

Due to the confirmed presence of recorded shallow mine workings in one seam a site investigation will be required. This should prove the crop position, the thickness of the Parrot (Hen) seam and its extent of any associated workings. Systematic planned investigations to locate and assess the condition, dimensions, attitude and depth of the two mine entries will be required as far as the boundary, ownership and safety of those operations allow. These should take into consideration the variance in expected positioning including the Coal Authority's locations and assigned errors. Since rock head is expected at shallow depth mechanical excavation is a natural option to first advance the search for the mine shaft and adit. As a result of the depth of investigation that might subsequently be required to prove any located feature, it is possible that both mine entries will require drilling works.

The number, depth and distribution of those boreholes should be designed by a competent engineer/geologist to reflect the information gathered at the time and the risk posed to the proposed development. It is important to note that the Coal Authority through its role as a planning consultee and from its published position statement in respect to building over or in the near proximity of mine entries, that the location of mine entries is expected to inform changes to the development layout. Based on current knowledge the mine shaft 364175-007 could without remedial consideration affect the site parking area and the mine adit 364175-008 the apartment building and its foundations, internal roads and parking areas and the proposed bins and bike storage areas. It is important that physical obstacles are removed as far as possible to allow the investigations freedom to undertake works across the site in order to provide

the necessary coverage. Failure to do so could result in a planning objection being maintained.

The site investigations will need to be carried out by a competent contractor, taking into account the findings of this report and employing a safe system of works. The results should be interpreted by a qualified and competent person so that an appropriate remedial strategy can be developed.

Guidance on drilling or piling through coal can be found at:

www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases

Due to the difficulties in identifying coal related gas hazards, it may be prudent to consider basic gas protection measures within the foundation design, which are resistant to permanent gases (Carbon dioxide, Methane, Carbon Monoxide) and comparable to that suggested in BR211, as commonly used to protect against Radon in residential properties.

Bearing in mind the nature of the shallow workings, the most likely ground remediation / stabilisation strategy would be grout injection to fill any mine void spaces that could lead to ground instability in or around the proposed development. As rock head is expected to be shallow and equally the related mining features there exists a potential for excavation and reinstatement of engineered fill to remove mining features and reduce the reliance on grouting. All remedial strategies will have to be designed by a qualified and competent engineer and carried out by a qualified and competent contractor after first obtaining a permit from the Coal Authority.

As an alternative to grouting stabilisation works, where development is proposed over areas of coal and past coal workings at shallow depth, developers should consider wherever possible removing the remnant shallow coal. This will enable the land to be stabilised and treated by a more sustainable method; rather than by attempting to grout fill any voids and consequently unnecessarily sterilising the nation's asset. Prior extraction of surface coal requires an Incidental Coal Agreement from the Coal Authority. Further information can be found at:

www.gov.uk/get-a-licence-for-coal-mining

You may also wish to refer to the Construction Industry Research and Information Association (CIRIA) publication Special Publication 32 "Construction over Abandoned Mine Workings".

b) Coal Authority permit


Any intrusive activities, including initial site investigation boreholes and any subsequent treatment of coal mine workings/coal mine entries for ground stability purposes require

the prior written permission of the Coal Authority. Application forms for Coal Authority permission and further guidance on this matter can be obtained from the Coal Authority's website at:

www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property

c) The development lifecycle and follow-on services

This risk assessment forms part of a much wider proposition to assist you in developing this land.



Phase 1	High-level risk overview
Phase 2	In-depth risk assessment report
Phase 3	Design of ground investigation
Phase 4	Supervision of ground investigation works

Follow on services can be requested using the details in the contacts section.

Section 5 – Conclusions

This report has identified that the proposed development site has been subject to past coal mining activity associated with exploitation of the Parrot (Hen) seam. Crop working of the Parrot (Hen) seam are recorded on the abandonment plan and investigations will be required in the north of the site at shallow depth to determine their extents and any remediation. The recorded shallow workings affecting the site in the seams below the Parrot coal, as reported on the mining report are at a depth which surface instability would not be a consideration and no investigation into the lower seams is considered as necessary. Two mine entries, shaft 364175-007 and adit 364175-008 relating to the former Staple Hill Colliery are expected to be within or close to the boundary of the development site. Both will need investigation to locate and determine their condition size and potential influence on the planned development, as far as is possible within the site curtilage. If located remedial works to stabilise these entries to remove reasonable risk of them causing future instability will be required. The risk to the site as a result of legacy mining features is considered to be high.

As a result of mine entries possibly being present within the site, the layout of the development may require amendment depending on the results of investigations and later remedial measures.

Nevertheless, subject to the undertaking of appropriate site investigations and any potential necessary remedial measures as outlined in Section 4a of this report, the Coal Authority considers that the site can be made safe and stable for future development and the risk to the development reduced to low.

Section 7 – Appendices

Appendix A – Plan showing proposed development layout

Appendix C – Non-Residential Coal Mining Consultants Report *(Please note that following investigations herein the adit location 364175-008 shown is expected to be revised by the Coal Authority).*

Debbie Crosby
South Gloucestershire Council
Badminton Road Offices
Badminton Road
Yate
South Gloucestershire BS37 5AF

Date: 06/05/16
Our Ref: 52804
Your PO: R86736

Dear Sirs

Re: - Staple Hill Former Infants School Block Page Road Bristol -

Thank you for your enquiry which we received on 29/04/16

We have searched our records and report as follows:-

Past Mining Activity

The property is situated in an area that was worked for coal in the 18th century and again for a short time in 1905 to 1908.

The geological sheets show that the Cock and Chick veins outcrop to the north and dip in that direction away from the property. These seams and any workings they may contain will therefore be of no concern.

The Hen Vein is shown to outcrop across the property, just to the north of the building footprint and dip in that direction away from the school buildings. The seam will be present beneath the northern portion of the site from just below the surface down to around 60 feet at the northern perimeter and may have been worked along the crop and from bell pits at an early date.

Crop workings were essentially linear quarries from which the most easily accessible coal was extracted, down to a depth of about ten feet. Once exhausted these trenches would be backfilled and the land returned to agriculture.

Bell pits were primitive shafts that worked the coal down dip from crop workings. Generally these were narrow, 3 or 4 feet in diameter and were sunk to a depth of 15 – 30 feet, although deeper examples have been encountered. The life of these concerns were short, typically a

*Company Secretary:
Consultants:*

*olc Accountancy
Mr. I Greenfield BA Hons*

few months only, with the coal being won from the bottom of the shaft from about 10 feet from pit bottom. Raising the coal was by windlass using wicker baskets or courves.

A second seam will be present beneath the property at depths that range from 150 feet at the southern boundary down to 350 feet at the northern perimeter.

The Staple Hill Drift Mine, which is present within the boundary of the site, just to the north of the building footprint was driven in 1905. At the same time a shaft known as Pendennis Pit was sunk about 900 feet to the north west of the school.

Once the shaft and drift entry encountered the seams of the Upper Coal Measures, it was apparent that most of the coal in the upper seams had been extracted in the 18th century, possibly from Braggs Pit, which lies 1,000 feet to the north west of the property. The Staple Hill Drift Mine and Pendennis Pit projects were both abandoned in 1908.

Unfortunately no plans survive from these early workings, if indeed they ever existed, as the early pits associated with them closed prior to the requirement in law to keep records of this nature. Should unrecorded workings be present beneath the school they are likely to lie at depths in excess of 150 feet. Generally workings of this depth and age will be of no concern, ground movement having normally long since ceased.

Shafts and Adits

One shaft and the drift entrance are present within the boundary of the property and a second shaft is located around 10 feet to the east to the site.

We have no information as to whether these shafts are filled or capped, or to what standard.

A well is situated on or just beyond the western boundary. These were common features used to draw commercial and domestic water prior to the provision of the mains water supply. These shafts were normally no more than 3-4 feet in diameter and of no concern.

Water and Drainage Levels

None are known in the vicinity

Surface Geology

The property stands on beds of Carboniferous sandstones that contain the coal seams of the Upper Coal Measures.

Subsidence

We have no knowledge of damage to property caused by subsidence specifically attributable to mining activity in the immediate area.

Disclaimer

Whilst we believe that our archive is truly comprehensive we nevertheless acknowledge that there may be documentary sources unknown to us. Consequently this report is limited to the information in our possession.

Because the information in the report is obtained from records and documents prepared by others, it follows that the company cannot accept responsibility for any inaccuracies in those records or omissions from them.

If we express an opinion as to whether any mine workings revealed by this report would affect the property, we do so, on the basis of a theoretical relationship between the depth of the workings and the size of the seam. Any risk of subsidence also diminishes with the age of the workings. However, recent experience makes it plain that if there are workings under or adjacent to the property, there may be some degree of risk.

Yours faithfully

Bristol Coalmining Archives Limited

COAL AUTHORITY
CORRESPONDENCE.



**The Coal
Authority**

Resolving the impacts of mining

Permitting Office
Coal Authority
200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

T 01623 637450 (Permitting)
www.gov.uk/coalauthority

Our Ref: 19538

11th February 2020

Your Ref:

Geotesting Services
The Estate Office
Walnut Treet Farm
Cleeve
Bristol
BS19 4PO

For the attention of Georgina Cutler

Dear Sir/Madam

**Former Page Road School, Staple Hill, Bristol
Application for a Permit to Enter or Disturb Coal Authority Mining Interests**

I refer to your application, on behalf of your client for permission to enter the Coal Authority's property. Attached to this letter is the signed permit certificate and supporting documentation which allows you to carry out the works to the specifications in the documents you submitted within "the site" as shown on the attached plan.

Please note that you may require permission from other property owners such as the surface land owner or other mineral owners.

You should be aware that mine gas may be present within coal seams, voids in shallow mine workings, mine entries, voids above such workings and in any permeable strata or surface fill material. More guidance on managing the risk of hazardous gases can be viewed on our website.

Consequently there is a risk of encountering mine gas during the proposed works. All boreholes and excavations should be regularly tested, particularly at times of falling barometric pressure, for all gases associated with coal mining, commonly carbon dioxide, carbon monoxide, methane, oxygen and hydrogen sulphide.

If mine gas or mine water is encountered, you should ensure that such occurrences are documented and that appropriate actions are taken. Any surface construction must take account of the risks associated with building on land that may be susceptible to surface emissions of mine gases and mining related instability. Care should be taken to ensure any exposed coal seams and all boreholes and excavations are effectively sealed with a cement based material at the earliest opportunity to prevent continued ingress of air.

The accompanying permit certificate and supporting documentation should be distributed to all interested parties (especially the site operatives) and be available on site for inspection by ourselves or by the HSE.

This permit certificate is issued on the understanding that, under no circumstances will works other than those specified, be carried out without the prior written approval of the Authority.

You must employ systems for managing health and safety; identifying hazards, assessing risks, creating risk profiles and establishing control measures to control risk to 'As low As Reasonably Practicable' (ALARP). You must ensure at all times that control measures are maintained to prevent and if necessary mitigate against any loss of control. Risks must be controlled to ALARP.

It is your duty to consider if the Borehole Sites and Operations Regulations 1995 apply to your activity and comply with the regulations as required.

It is the responsibility of the Designer to ensure that the proposed works are sufficient for any planned developments at the site, especially if the discharge of a planning condition is necessary. If at any point you consider that additional works may be required please contact me to discuss this.

Please submit full details of all works undertaken as required by section 8 of the permit terms and conditions, when the works are complete. At this time you will need to confirm if the permit should remain in place. If you wish to discuss this or any other matter, please do not hesitate to contact me using the contact details shown.

Important:

Information about coal mining related hazards may be available from the Coal Authority's online interactive viewer (<http://mapapps2.bgs.ac.uk/coalauthority/home.html>): NOTE – the online viewer may not contain the latest information in the Coal Authority's possession. The Coal Authority's online viewer should not be used as a sole reference.

I can also provide basic details regarding the recorded mine entry/ies on/near the site:

Reference:	Reference: 364175-008
Types:	Type: Adit
Co-ordinates:	364758 175871
Departure:	Departure: 8m
Depth:	Depth Unknown
Drift Thickness:	Drift Thickness Unknown
Assumed Diameter:	Assumed Diameter: 3m
Shaft Diameter:	Shaft Diameter: N/A
Adit Bearing:	NA
Treatment Date:	Treatment Date: N/A
Treatment Details:	Treatment Details: N/A
Possible Contamination:	Not Known
Colliery Name:	Colliery Name: Unknown
Source:	Source: Ab plan 5309 Geological Sheet Other: 1987 Bristol Environmental Geological Study (BEGS)

Please note that the mine entry dimensions and coordinates provided above are approximate. Where mine entries have not been physically located the positions are estimated based on historic sources (OS map, abandonment plan, other plans), such plans may have inherent inaccuracies. The Departure provided in the details is a generalised indication of the assumed accuracy of the historic source material, it should not be interpreted and as a definite measure.

Other information sources for these features may exist elsewhere. It is the applicant's responsibility to examine the source material themselves to assess the position and characteristics of any mine entry. It may be prudent to ensure the Coal Authority's plotted positions are investigated if you do not discover the shafts in your own plotted positions. You should also be aware of the potential limitations in accuracy of positioning systems when transposing the approximate coordinates onto the site. Please ensure any search or standoff areas are designed to accommodate the potential variables described above.

Mine entries pose significant hazards such as mine gas, mine water and catastrophic ground failure. Working in close proximity to mine entries increases the risks from those hazards. The zone of collapse is often proportional to the depth of superficial material above rockhead and may extend offsite. Please ensure all appropriate measures and steps are taken to ensure mine entries are investigated safely.

If any mine entries are encountered during your proposed works you are required to provide the Authority with the results of your investigations together with the proposed specification for any treatment works, for comment and approval, prior to treatment works commencing.

Please quote the Coal Authority Reference No.19538 on all future correspondence.

If you want further information on the Permitting process, please visit:

<https://www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property>

The Permitting Office is open: Monday to Thursday – 8:45am to 5pm and Friday – 8:45am to 4.30pm for any queries.

Yours faithfully

Jake Morris

Permitting Manager

T 01623 637127

E permissions@coal.gov.uk



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 19538

Name and Address of Permit Holder:

South Gloucestershire Council
Council Offices
Badminton Road
Yate

Site Location:

Former Page Road School
Staple Hill
Bristol

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

Investigation to locate position of outcrop by excavation within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of 12 months from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- Gas Monitoring CO, CH₄, CO₂, O₂, H₂S at excavation
- Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works

Signed: Jake Morris Granted Date: 11/02/2020

For and on behalf of The Coal Authority

Nominated Representative: Jake Morris, Permitting Manager;
The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG
Tel: 01623 637450; E-Mail: permissions@coal.gov.uk

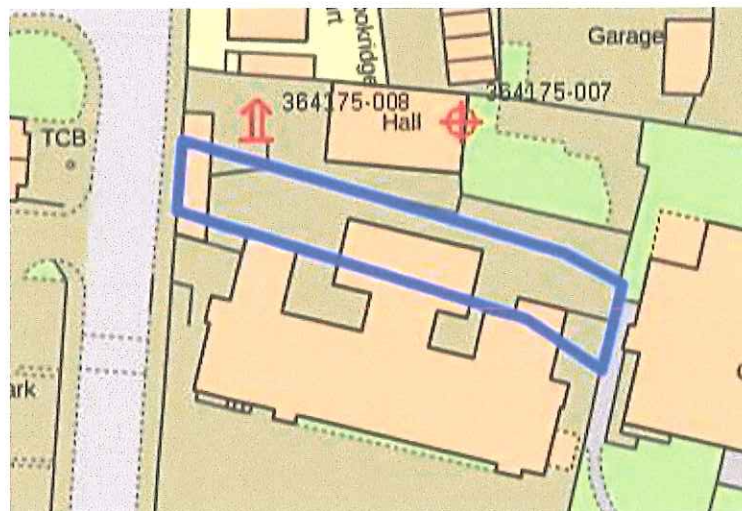


The Coal
Authority

Granted Permit Boundary

Permit Ref: 19538

Permit Boundary:



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Permit Ref.	19538	Project / Site Location	Former Page Road School, Staple Hill, Bristol,
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Please supply all relevant documents, including this completed form within 3 months of the permitted works being completed.

Where relevant the report should include; borehole logs and details of mine or mine entry treatment works carried out (incl. engineering drawings, grout takes etc.) and a scaled site layout plan (correlated to O.S N' Grid) showing all relevant mine entry positions, coal seams, voids and broken ground proved by the works.

Summary of works

Start date

Finish date

Have any variations occurred? ☐ No ☐ Yes **If so was the Authority notified?** ☐ No ☐ Yes

Please describe;

Did if any of the following incidents occur?

- ☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels)
☐ Geotechnical instability ☐ Legal issues incl. damage or potential claims ☐ **None**

If yes, please detail each item;

Were any of the following encountered? Please give a brief summary of the works undertaken.

- ☐ Intact coal only ☐ Broken ground ☐ Backfilled ground ☐ Voids

Description;

Will further works be necessary that require a Permit? ☐ No ☐ Yes

If yes, please describe, including any recommendations;

Name:	Email:
Company:	Tel:

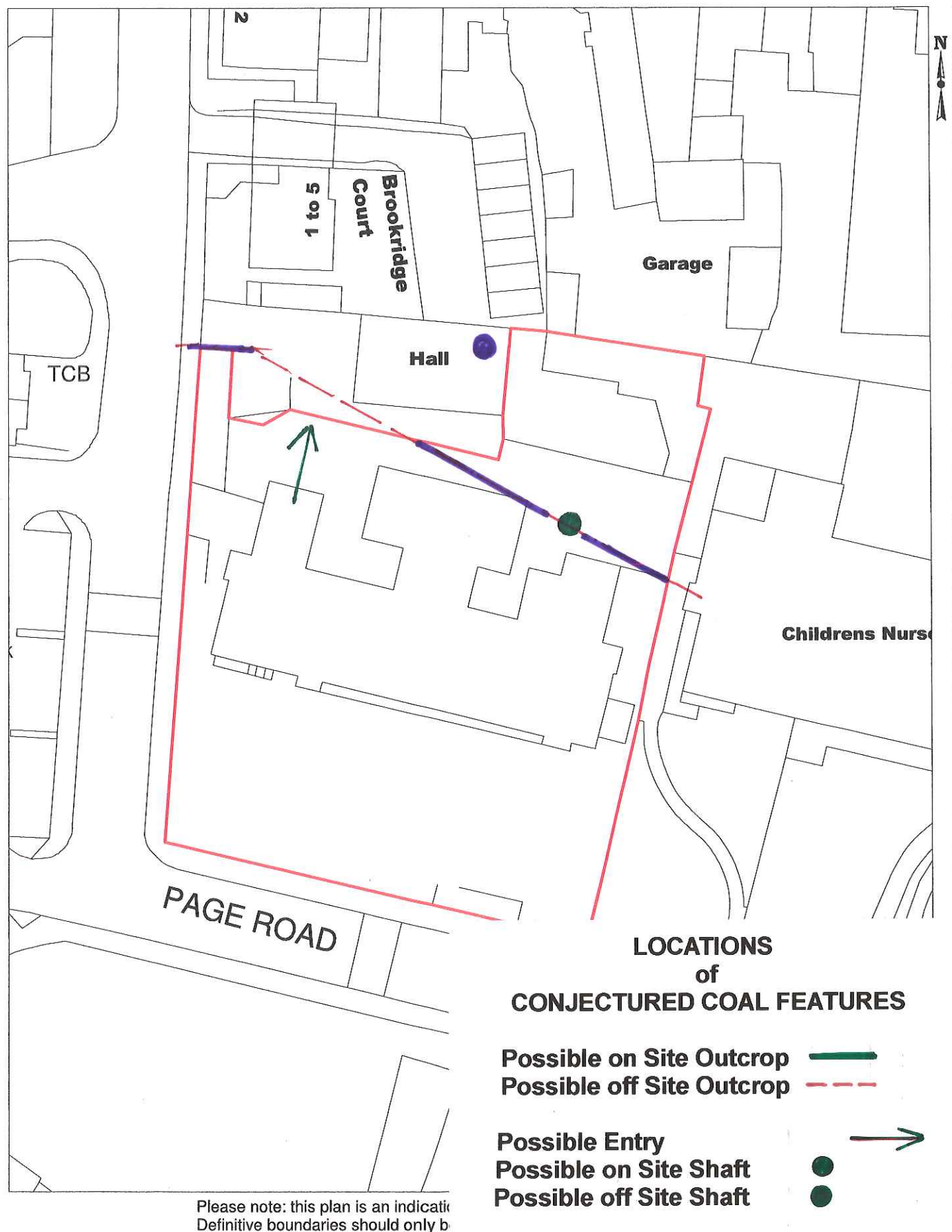
Former Staple Hill Primary School

Ex Infant Block

CE&CR Department
PO Box 300
Property Services
Civic Centre
High Street
Bristol
BS15 0DS
Telephone 01454 863243

Compiled by Jeremy Randall on 03/07/2014

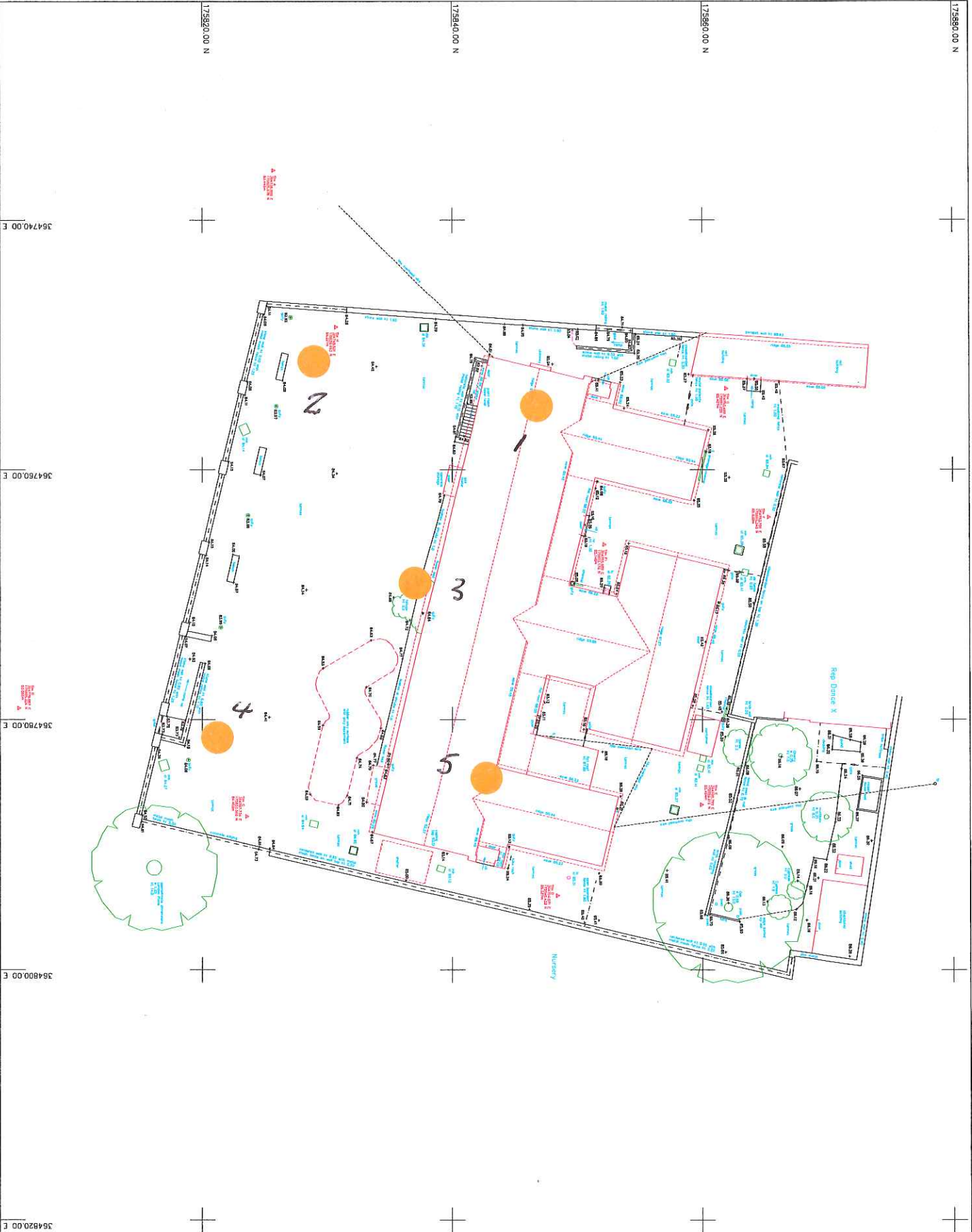
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CHEMICAL TESTING RESULTS.

CHEMICAL TESTING

MELANGE SAMPLE LOCATIONS.



STANDARD REFERENCES	
1. British Standards Institution (BSI) - British Standards	2. British Standards Institution (BSI) - British Standards
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CHEMICAL TESTING

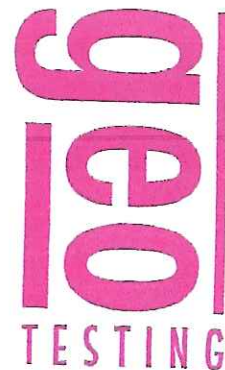
CHAIN of CUSTODY.

GEO-TESTING SERVICES

GROUND INVESTIGATION SERVICES

Telephone: 07771 667339

Email: admin@geotesting.co.uk



CHEMICAL TESTS CHAIN OF CUSTODY.

**SITE. 2021/1100 SOUTH GLOUCESTERSHIRE
BRISTOL.**

Laboratory: i 2. Analytical

Sampling Date: 25th January 2021 . Time: 09.00

Sample Locations: As report plan.

Sample No. 2021/1100

To & Inc.

Sample No. 2021/1105 Melange Depth 0.50 to 1.00m

Samples despatched. 25th January 2021.

**Samples despatched by hand in i2 brown glass
jars/vials.**

SUITES:

Normal.

No asbestos testing required.

No organic matter required.

G.L.Cutler BSc. Hons. FGS..... 

GEO-TESTING SERVICES

The Estate Office
Walnut Tree Farm
Cleeve
Bristol

UKAS LABORATORY

TEST RESULTS.



Haydn Harrison
Avon Concrete Testing Services
The Estate Office
Walnut Tree Farm
Cleeve
Bristol
BS49 4PQ

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

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

e: hsh@geotesting.co.uk

Analytical Report Number : 21-53077

Project / Site name:	2021-1100 South Gloucestershire Bristol	Samples received on:	25/01/2021
Your job number:		Samples instructed on/ Analysis started on:	26/01/2021
Your order number:		Analysis completed by:	04/02/2021
Report Issue Number:	1	Report issued on:	04/02/2021
Samples Analysed:	5 soil samples		

Signed: 

Zina Abdul Razzak
Senior Quality Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

Excel copies of reports are only valid when accompanied by this PDF certificate.

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

Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number	1748037	1748039	1748041	1748043	1748045
Sample Reference	2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled	25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken	0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	21
Total mass of sample received	kg	0.001	NONE	0.4	0.4

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	7.7	8.2	7.2	7.7
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1200	1000	1100	1100	940
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	33	31	34	30	38
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.016	0.017	0.015	0.019
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.6	15.5	17	15	19.2
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.9	-	-	-	-

Phenols by HPLC

Catechol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Total Phenols

Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.23	0.47
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.62	0.57	0.67	0.41	1.4
Pyrene	mg/kg	0.05	MCERTS	0.77	0.6	0.72	0.39	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.54	0.46	0.64	0.43	1.3
Chrysene	mg/kg	0.05	MCERTS	0.45	0.43	0.47	0.38	0.98
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.89	0.78	1.2	0.65	1.8
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.53	0.31	0.28	0.24	0.52
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.63	0.47	0.74	0.49	1.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.33	0.28	0.4	0.28	0.71
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42	0.31	0.47	0.37	0.84

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.18	4.21	5.54	3.87	10.8
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	3.5	< 1.0	< 1.0	4.3
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	44	45	65	55
Barium (aqua regia extractable)	mg/kg	1	MCERTS	190	160	230	190	210
Beryllium (aqua regia extractable)	mg/kg	0.05	MCERTS	0.65	0.6	0.79	0.7	0.73



Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number				1748037	1748039	1748041	1748043	1748045
Sample Reference				2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled				25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken				0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	2.8	2.3	2.2	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2	2.2	2.8	2.7	2.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	17	23	19	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	25	31	28	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190	190	240	210	240
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	24	32	27	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	440	410	490	450	500

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	39	35	29	84
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	17
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	31	26	23	56
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	11
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	39	35	29	73
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	39	35	29	84

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Total PCBs by GC-MS

This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number				1748037	1748039	1748041	1748043	1748045
Sample Reference				2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled				25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken				0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Total PCBs				mg/kg	0.007	MCERTS	< 0.007	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1748037	2021/1100	None Supplied	0.50-1.00	Brown sandy clay with gravel and vegetation.
1748039	2021/1102	None Supplied	0.50-1.00	Brown sandy clay with gravel and vegetation.
1748041	2021/1103	None Supplied	0.50-1.00	Brown loam and clay with gravel and vegetation.
1748043	2021/1104	None Supplied	0.50-1.00	Brown loam and clay with gravel and vegetation.
1748045	2021/1105	None Supplied	0.50-1.00	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 21-53077
Project / Site name: 2021-1100 South Gloucestershire Bristol

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Phenols, speciated, in soil, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	D	NONE
TPH Banding In Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS



Analytical Report Number : 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number				1748037	1748039	1748041	1748043	1748045
Sample Reference				2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled				25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken				0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	25	12	180	25	21
Total mass of sample received	kg	0.001	NONE	0.4	0.4	0.4	0.4	0.4

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	7.7	8.2	7.2	7.7
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1200	1000	1100	1100	940
Water Soluble Sulphate as SO ₄ 16hr extraction (2:1)	mg/kg	2.5	MCERTS	33	31	34	30	38
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.016	0.017	0.015	0.019
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.6	15.5	17	15	19.2
Total Organic Carbon (TOC)	%	0.1	MCERTS	3.9	-	-	-	-

Phenols by HPLC

Catechol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Total Phenols

Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.23	0.47
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.62	0.57	0.67	0.41	1.4
Pyrene	mg/kg	0.05	MCERTS	0.77	0.6	0.72	0.39	1.4
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.54	0.46	0.64	0.43	1.3
Chrysene	mg/kg	0.05	MCERTS	0.45	0.43	0.47	0.38	0.98
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.89	0.78	1.2	0.65	1.8
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.53	0.31	0.28	0.24	0.52
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.63	0.47	0.74	0.49	1.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.33	0.28	0.4	0.28	0.71
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42	0.31	0.47	0.37	0.84

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.18	4.21	5.54	3.87	10.8
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	3.5	< 1.0	< 1.0	4.3
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	37	44	45	65	55
Barium (aqua regia extractable)	mg/kg	1	MCERTS	190	160	230	190	210
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.6	0.79	0.7	0.73

Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number				1748037	1748039	1748041	1748043	1748045
Sample Reference				2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled				25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken				0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	2.8	2.3	2.2	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2	2.2	2.8	2.7	2.8
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	17	23	19	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	25	31	28	32
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190	190	240	210	240
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	24	32	27	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	440	410	490	450	500

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH C10 - C40	mg/kg	10	MCERTS	< 10	39	35	29	84
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	17
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	31	26	23	56
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	11
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	39	35	29	73
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	< 10	39	35	29	84

PCBs by GC-MS

PCB Congener 28	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 52	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 101	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 138	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 153	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 180	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Analytical Report Number: 21-53077

Project / Site name: 2021-1100 South Gloucestershire Bristol

Lab Sample Number				1748037	1748039	1748041	1748043	1748045
Sample Reference				2021/1100	2021/1102	2021/1103	2021/1104	2021/1105
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Date Sampled				25/01/2021	25/01/2021	25/01/2021	25/01/2021	25/01/2021
Time Taken				0900	0900	0900	0900	0900
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Total PCBs by GC-MS								
Total PCBs				mg/kg	0.007	MCERTS	< 0.007	< 0.007

U/S = Unsuitable Sample I/S = Insufficient Sample