Dean Moor
Solar Farm

Environmental Statement: Appendix 10.2 – Coal Mining Hazard Assessment (CMHA)

on behalf of **FVS Dean Moor Limited**

March 2025
Prepared by: Stantec UK Ltd
PINS Ref: EN010155
Document Ref: 6.3
Revision: 1

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DEAN MOOR SOLAR FARM

ENVIRONMENTAL STATEMENT

APPENDIX 10.2 – DESK-BASED COAL MINING HAZARD ASSESSMENT

PLANNING INSPECTORATE REFERENCE EN010155

PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, Regulation 5(2)(a)

Project Ref:	**EN010155/ES/Appendix 10.2: Desk Based Coal Mining Hazard Assessment**
Status:	Final
Issue/ Rev:	1
Date:	March 2025

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1. Introduction

1.1. Preamble

1.1.1 This Coal Mining Hazard Assessment has been commissioned by the Applicant to provide an assessment of the possible hazards associated with historical coal mining and the potential to affect the Proposed Development on land that extends to approximately 276.5ha and is located approximately 1.1km east of the Lillyhall Industrial Estate, 600m east of the small village of Gilgarran, approximately 900m west of Branthwaite, and approximately 5km southeast of Workington town centre on the west Cumbrian coast. The hamlet of Branthwaite Edge is directly adjacent to the east of the Site.

1.1.2 The Site is situated within the administrative area of Cumberland Council (the 'Council'). The Site Location Plan showing the Site boundary is included as ES Figure 1.1 [**REF: 6.2**].

1.1.3 This report presents a Coal Mining Hazard Assessment for the Proposed Development, to provide the Planning Inspectorate and the Council and relevant stakeholders with information pertaining to the mining legacy in the area, and an assessment of the potential impact to land stability for the Proposed Development.

1.1.4 It should be noted that a Phase 1 Ground Conditions Assessment has been carried out for the Site (ES Appendix 10.1) [**REF: 6.3**] which assesses whether there are general land instability or contamination risks associated with the ground conditions that require management / mitigation as part of the Proposed Development.

1.1.5 It is noted that as of 28 November 2024 the Coal Authority has been renamed to the Mining Remediation Authority, as such any references within this report to the Coal Authority ('CA'), should be taken to refer to the Mining Remediation Authority.

1.2. Proposed Development

1.2.1 The Proposed Development comprises the construction, operation, and decommissioning of a solar photovoltaic ('PV') energy generating station with a total capacity exceeding 50 Megawatts ('MW') comprising solar PV arrays, grid connection infrastructure, associated infrastructure, and green infrastructure.

1.3. Regulatory Framework

1.3.1 The Coal Authority (CA) interactive mapping shows that the Site is situated within a CA reporting area and a Development High Risk Area. Guidance from the CA indicates that most development within a Development High Risk Area requires a site-specific coal mine risk assessment to be undertaken to comply with statutory obligations. Solar arrays are, however, often considered to be exempt from these requirements as the building/groundworks are typically of limited extent. In this case it was considered prudent to assess coal mining hazards due to the scale of the Proposed Development, which will include a number of buildings and access roads, together with the sensitive coal mining history of the Site and region.

1.3.2 This document has been prepared following the guidance presented within CIRIA C758D, Abandoned Mine Workings Manual, 2019, and CL:AIRE, Good Practice for Risk Assessment for Coal Mine Gas Emissions, October 2021.

1.3.3 The CA requires that coal mining hazard should be assessed by a Competent Person(s). Accordingly, this assessment was prepared by Mr Andrew Wyllie [redacted], reviewed by Ms Victoria Acres ([redacted]) and approved by Dr Clive Edmonds ([redacted]).

1.4. Objectives and Scope

1.4.1 The objectives of this study are to identify mining hazards that might affect the Proposed Development at the Site. Key objectives include:

a. Present a desk-based review of information relating to mining relevant to the Site;

b. Use this information to update and assess the risks to the Proposed Development from the mining legacy, including the cumulative impact of issues;

c. Set out appropriate mitigation measures where necessary to address the mining legacy issues affecting the Site, including identification of constraints to the development layout and/or recommendation of any investigation / remediation works necessary in order to facilitate the Proposed Development; and,

d. Demonstrate to the Council and the Coal Authority that the Site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on potentially unstable land.

1.5. Limitations

1.5.1 Guidance on the context of this report and any general limitations or constraints on its content and usage are given in a separate guidance note included after the text of the report.

1.6. Sources of Information

1.6.1 This assessment has been carried out using data obtained from the following sources:

a. A walkover of the Site was undertaken by Mr Andrew Wyllie on 28 and 29 April 2023.

b. The Coal Authority's Mine Abandonment Plans, Catalogue No. 7837 (1 of 3) No.1 Seam, 7837 (2 of 3) No.2 Seam, and 16661 (1 of 7 to 7 of 7) Potatopot Opencast mine.

c. Consultants Coal Mining Report for Gilgarran, Cumbria, CA14 4RF order ref. 51003348836001. Coal Authority. Nottinghamshire.[1]

d. BGS, 2004: Whitehaven. England and Wales Sheet 28 Solid and Superficial Geology 1:50,000 scale. (Keyworth, Nottingham: British Geological Survey).

[1] Note: Coal Authority Report obtained refers to previous red line boundary and does not include the north eastern roads area which was added as an extension. However, due to development proposals indicating that these areas are to remain unchanged, it was not considered necessary to reorder the report.

e. BGS, 1991: Lamplugh. England and Wales Sheet NY02SE Solid Geology 1:10,000 scale. (Keyworth, Nottingham: British Geological Survey.

f. BGS, 1998: Pica. England and Wales Sheet NY02SW Solid Geology 1:10,000 scale. (Keyworth, Nottingham: British Geological Survey.

g. The BGS / National Geosciences Data Centre historical borehole information[2].

h. BGS non-coal mining search[3]

i. Non-coal Cavities Database

1.6.2 Reports of any previous investigations on the Site have not been accessed.

[2] BGS online borehole records database viewer. Available at: **https://mapapps2.bgs.ac.uk/geoindex/home.html** Accessed April 2023
[3] BGS online non-coal mining database. Available at: **https://mapapps2.bgs.ac.uk/geoindex/home.html** Accessed April 2023

2. Land Use Information

2.1. Introduction

2.1.1 This section presents a summary of current and historical land uses on and adjacent to the Site. Land use is used to inform the potential hazard identification element of the risk assessment.

2.2. Site Location and General Description

2.2.1 The Site is centred on National Grid Reference NY 045 236, located between the villages of Gilgarran and Branthwaite in West Cumbria (the 'Site'), as shown on the Site Location Plan presented as ES Figure 1.1.

2.2.2 The Site extends to approximately 276.5ha and is located approximately 1.1km east of the Lillyhall Industrial Estate, 600m east of the small village of Gilgarran, approximately 900m west of Branthwaite, and approximately 5km southeast of Workington town centre on the west Cumbrian coast. The hamlet of Branthwaite Edge is directly adjacent to the east of the Site.

2.2.3 The northern part of Area A abuts an unclassified road, hereafter referred to as 'Branthwaite Road'. The southern boundary of Area C abuts Dean Cross Road. The unnamed north/south road between Branthwaite Road and Dean Cross Road, forming the eastern boundary of Area C, hereafter referred to as 'Branthwaite Edge Road'. The Site is bisected between Areas B and C by an unclassified road between Gilgarran and Branthwaite Edge, hereafter referred to as the 'Gilgarran Road' (also locally known as Colingate Road), as shown on the Site Layout Plan presented as Figure 2.1.

On-Site

2.2.4 The land gradually rises in elevation towards the south, with the topography becoming steep towards the Site's southern boundary. The lowest elevation is recorded in the northwest at approximately 84m Above Ordnance Datum ('AOD'), and the highest elevation of approximately 200m AOD is recorded in the southwest.

2.2.5 The land use is generally dominated by sheep pasture and heathland, with some localised areas of woodland.

2.2.6 Electric High Voltage ('EHV') cables are noted to traverse the Site, oriented approximately east-west land within the Site to the south of the 'Gilgarran Road', and approximately southwest-northeast in the land within the Site to the north of the 'Gilgarran Road'.

Land to the north of Gilgarran Road

2.2.7 The land within the Site to the north of the 'Gilgarran Road' (Area D) has been partially developed as a wind farm with three wind turbines and their associated infrastructure including cabling, gravel tracks, and outbuildings present within the central part.

2.2.8 Within the low-lying north-western part there is a large area of ponded surface water and saturated marshy land.

2.2.9 In June 2023, the boundary was extended to include the footprint for the two B-class roads between Wythemoor Sough to the north and the junction north of Branthwaite Edge to the east.

Land to the south of Gilgarran Road

2.2.10 In the land within the Site to the south of the 'Gilgarran Road' (Area C) an ordinary watercourse[4] named Thief Gill, as well as several other unnamed ordinary watercourses, flow through the Site from the south and west towards the north-east corner. Beyond the Site boundary, these watercourses combine to flow in an EA-designated main river named Lostrigg Beck, which continues in a north-east direction before joining the River Marron, approximately 6.5km to the northeast of the Site. Thief Gill flows northeast until it exists the Site via a bridge on the eastern boundary. Near the southern boundary of the Site, Thief Gill runs through a steep gorge.

[4] An ordinary watercourse is any channel that water flows through, which is not part of the main river network. It could be a river, stream, ditch, drain or brook

2.2.11 A small fenced off area on the southwest boundary represents a protected area associated with ancient standing stones.

Off-Site

2.2.12 Land use in the area surrounding the Site is generally similar to the land use on-Site, comprising largely pastural agricultural land with moorland and sporadic areas of woodland.

2.2.13 There are scattered residential properties in the surrounding area, mostly comprising farmyards and farmhouses.

2.3. Historical Land Use / Mining Setting

2.3.1 The historical land use relevant to the CMRA has been assessed using the historical mapping included as part of the Groundsure report included the Ground Conditions Assessment (Appendix 10.1).

On-Site

Land to the north of Gilgarran Road

2.3.2 The earliest available map from 1864 shows the land within the Site to the north of the ‘Gilgarran Road’ to comprise woodland and open fields as part of Wythe Moor. On-Site roads in the extension area to the northeast are noted to be present from these earliest map editions.

2.3.3 By 1898, a railway line on an embankment has been constructed across the centre of this area oriented approximately east-west, which remained on Site until the 1947 map edition where it was labelled as an “old wagon way”, before being recorded as “dismantled” on the 1967 map.

2.3.4 Large scale opencast mining (Potatopot mine) is first shown on the 1989 map. Historical aerial imagery shows this to have been backfilled and the Site restored to pasture by 2003.

2.3.5 The 1991 map shows the overhead electricity cables and pylons within the eastern part of the land to the north of the ‘Gilgarran Road’.

2.3.6 By 2016, the wind farm and associated infrastructure were constructed, followed by an access road along the northeastern boundary by 2018.

2.3.7 No other significant changes are shown to the most recent mapping (2023).

Land to the south of Gilgarran Road

2.3.8 The 1864 mapping shows the land within the Site to the south of the 'Gilgarran Road' to comprise rough pasture, labelled Dean Moor, with a quarry noted at the southern end of Thief Gill and an "old coal pit" on the southeast boundary.

2.3.9 The 1898 map shows an additional old quarry in the southwest. An "old shaft" is shown on the 1923 map.

2.3.10 Overhead and electricity cables and associated pylons are shown on the 1991 mapping.

2.3.11 No other significant changes are shown to the most recent mapping (2023).

Off-Site

2.3.12 Generally, the region is noted to have an extensive mining history, with coal pits, collieries, and shafts frequently highlighted on historical maps.

2.3.13 On the earliest available map dated 1864, the following relevant features are shown in the vicinity of the Site:

a. Two coal pits immediately south;
b. Colingate Quarry approximately 145m west;
c. Branthwaite Edge Quarry approximately 280m east;
d. Limekiln in Gilgarran Wood approximately 500m southwest;
e. Two coal shafts approximately 400m southwest; and
f. Tile works approximately 950m east, which may have associated clay pits.

2.3.14 The 1898 map shows many pits and shafts to be "old". Three collieries are shown within 1km of the Site:

g. Wythemoor Colliery approximately 100m to the northwest with associated wagonway and mine entries;

h. Deanmoor Colliery approximately 200m to the south with associated tramway and mine accesses; and

i. Moorside Colliery approximately 750m to the south with associated level and tramway.

2.3.15 By the 1923 map edition, Deanmoor Colliery, Colingate Quarry, and Branthwaite Edge Quarry are recorded to be disused. Moorside Colliery and Wythemoor Colliery have been redeveloped and expanded.

2.3.16 The 1947 no longer shows Wythemoor Colliery (although its associated mine entries are still indicated).

2.3.17 The 1951 map notes Moorside Colliery to be disused.

2.3.18 In 1989 with the commencement of opencast mining at the Potatopot mine, it is noted that the opencast mining area extends off-Site to the southwest and northwest by up to 1km, and consequently a large amount of disturbance is noted regionally.

2.4. Published Geology

2.4.1 The 1:50,000 scale geological map of Whitehaven, Sheet 28 (BGS, 2004[5]) and the 1:10,000 scale geological maps of NY02SW (BGS, 1998) and NY02SE (BGS, 1991) were reviewed alongside online data provided by the BGS to provide a summary of the anticipated geological regime of the Site. The deposits, lithologies and structural geology are described below. The superficial geology for the Site is presented as Figure 2.2, with the bedrock geology shown on Figure 2.3.

Artificial Ground

2.4.2 The land within the Site to the north of the 'Gilgarran Road' is recorded to be almost entirely underlain by anthropogenic deposits, pertaining largely to the presence of the Potatopot Opencast coal mining activities. Of this, the majority of the land within the Site to the north of the 'Gilgarran Road'

[5] BGS 1:50,000 scale Bedrock and Superficial map, Sheet Number 28 (2004).

is recorded as Infilled Ground, with the rest shown to be general Made Ground[6].

2.4.3 No Made Ground is recorded underlying the land within the Site to the south of the 'Gilgarran Road', with the exception of a small area at the end of Thief's Gill at the location of a former quarry.

Superficial Geology

2.4.4 The majority of the Site is shown to be underlain by Devensian-aged Glacial Till noted to comprise sandy clay deposits, with silt and sand pockets.

2.4.5 Alluvium is shown in the vicinity of Thief Gill and its tributaries, and the tributary to Lostrigg Beck, generally comprising unconsolidated clay, silt, sand and gravel.

2.4.6 Alluvial Fan Deposits are shown at the mouth of tributary valleys, generally comprising loose rock material.

2.4.7 Peat is shown near the eastern flowing tributary of Thief Gill as well as an area near the northwestern corner of the Site.

2.4.8 Three areas of the Site are indicated to contain landslide deposits (the debris of former landslides and likely comprising the same constituent material as the upslope areas):

a. The largest crosses the southern boundary near the southeastern corner of the Site and extends to the west across the southern parts of the Site;
b. A relatively small area located in the southwestern quarter of the land within the Site to the south of the 'Gilgarran Road'; and
c. A relatively small area located across the western boundary of the land within the Site to the south of the 'Gilgarran Road'.

[6] Made ground: anthropogenic ground in which the material has been placed without engineering control and/or manufactured by man in some way, such as through crushing or washing, or arising from an industrial process. BS5930.

Bedrock Geology

2.4.9 The Site is predominantly underlain by sedimentary strata comprising cyclical strata of sandstone, siltstone, and mudstone with economically viable seams of coal throughout. It is highlighted that in the land within the Site to the north of the 'Gilgarran Road, the historical opencast mining activity would have largely removed the shallow bedrock.

2.4.10 The **Whitehaven Sandstone Formation** forms the uppermost unit of the Carboniferous strata and outcrops in the land within the Site to the south of 'Gilgarran Road'. It comprises a succession of red to purplish brown cross bedded sandstones, mudstones, siltstones and thin coals and limestones. It is recorded by the BGS as being in excess of 300m thickness.

2.4.11 The Pennine Middle and Lower Coal Measure Formations underlie the Whitehaven Sandstone Formation.

2.4.12 The **Pennine Middle Coal Measures Formation** ('PMCMF') comprises mudstone, siltstone and sandstone with numerous coal seams, including the Black Metal Coal, Fireclay Coal, Tenquarters Coal, Bannock Band Coal, Main Band Coal and Yard Coal. This stratum outcrops north of the centre and in the eastern part of the Site and are indicated by the BGS to be up to 200m thick.

2.4.13 The **Pennine Lower Coal Measures Formation** ('PLCMF') comprises mudstone, siltstone and sandstone with coal seams, including the Little Main Coal, Lickbank Coal, Sixquarters Coal, Upper Threequarters Coal, Lower Threequarters Coal and the Albrighton Coals. This stratum outcrops north of the centre and in the eastern part of the Site and are indicated by the BGS to be up to 200m thick.

2.4.14 A summary of the coal seams identified through the various information sources is presented in Table 2.1 below. Due to the past nature of underground coal mining by independent small-scale mining enterprises, it is often the case that coal seams have differing local/regional names. In this instance, both the BGS and CA have utilised differing regional names

for the same seam. Given this discrepancy, the author attempted to reconcile the names used and in Table 2.1 below, listed seams are named together with their alternative name shown in brackets. The location and depth of these seams in the context of the Site is discussed further in Section 3.

Table 2.1: Summary of Recorded Coal Seams

Formation Name	Lithology	Coal Seam Name
Pennine Middle Coal Measures Formation (PMCM)	Interbedded grey mudstone, siltstone, pale grey sandstone, and coal seams commonly	Unnamed Coal J
		Unnamed Coal I
		Unnamed Coal H (Unnamed 8 Coal)
		Unnamed Coal G
		Unnamed Coal F (Unnamed 6 Coal)
		Unnamed Coal E
		Brassy Coal
		Black Metal Coal
		Fireclay Coal
		White Metal Coal
		Slaty Coal
		Tenquarters (Upper Tenquarters) Coal
		Rattler Coal
		Bannock Band Coal
		Main Band Coal
		Yard Coal
Pennine Lower Coal Measures Formation (PLCM)	Interbedded grey mudstone, siltstone, and pale grey sandstone, commonly with mudstones	Half Yard Coal
		Little Main Coal
		Eighteen Inch Coal

Formation Name	Lithology	Coal Seam Name
	containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.	Lickbank Coal
		Sixquarters Coal
		Upper Threequarters Coal
		Lower Threequarters Coal
		Albrighton Coals
		Harrington Four Foot Coal

Structural Geology

2.4.15 Geological records indicate the Site to be located on the southern limb of a gently dipping anticlinal structure, plunging towards the east. Strata are recorded to dip generally towards the south at an angle of approximately 4° to 6°.

2.4.16 Significant faulting is noted within the Site, with a series of normal faults present and oriented approximately north-south, particularly within the land within the Site to the south of the 'Gilgarran Road'. A large fault running through the land within the Site to the north of the 'Gilgarran Road' from approximately its northwestern extremity to its southeastern corner. It is anticipated that more unrecorded minor faults may be present.

3. Historical Coal Mining Data Review

3.1. Coal Authority Data

Coal Authority Interactive Map Viewer

3.1.1 The CA Interactive Mapping[7] tool indicates that the Site lies within a Coal Mining Reporting Area. Table 3.1 below presents a summary of the information presented on the website regarding the Site area:

Table 3.1: Review of Coal Authority Information

Item	Yes	No	Remarks
Inside a coal mining reporting area	✓		
Coal Outcrops	✓		Yes – five outcrops are shown.
Development High Risk Area	✓		Yes – the entirety of the land within the Site to the north of the 'Gilgarran Road', and localised areas within the land to the south of the 'Gilgarran Road' (typically restricted to coal outcrops, mine entry positions, and the area of the land within the Site to the south of 'Gilgarran Road' highlighted as having "probable shallow coal workings")
Mine Entry	✓		Yes – 7 noted in the land within the Site to the north of the 'Gilgarran Road'. 21 noted in the land within the Site to the south of the 'Gilgarran Road.
Mine Entry Potential Zone of Influence	✓		Yes – 7 noted in the land within the Site to the north of the 'Gilgarran Road'. 21 noted in the land to the south of the 'Gilgarran Road'.
Probable shallow coal mine workings	✓		Yes – an area of the land within the Site to the south of the 'Gilgarran Road' is noted to be affected by probable shallow coal mine workings. This may be an error or may not

[7] CA Interactive Mapping tool. Available at: [redacted] Accessed April 2023

Item	Yes	No	Remarks
			define extents suitably as the area is perfectly square and isolated.
Past shallow coal mine workings	✓		Yes – these are shown to be present in the extreme southeast of the land within the Site to the south of the 'Gilgarran Road and the extreme northwest of the land within the Site to the north of the 'Gilgarran Road.'
Surface Mining (Past and Current)	✓		Yes – The entirety of the land within the Site to the north of the 'Gilgarran Road is noted to be affected by past surface mining.
Surface Coal Resource Area	✓		Yes – the entire Site
Abandoned Mines Catalogue	✓		Yes – 14 plans are listed as representing mines within the Site.

3.1.2 The CA interactive map viewer records seven seams of coal which subcrop within the Site: Unnamed 1, Unnamed 2, Unnamed 3, Unnamed 4, Unnamed 5, Upper Ten Quarters, and the Yard Coals.

Coal Authority Consultants Coal Mining Report

3.1.3 The Coal Authority's Consultant Coal Mining Report (Ref: 51003348836001) contains five records of past underground mining at the Site (CA, 2022) at the level of the Unnamed 6, Two Foot, Upper Ten Quarters, Yard, and Unnamed 8 Coal seams. The depths of these records range from 17m to 100m bgl. Of these, two records are considered to represent shallow past underground mining beneath the Site. The two shallow records are noted to comprise workings at the level of the Unnamed 6 Coal at 17m bgl (recorded abstraction of 0.56m thickness), and at the level of the Two Foot Coal at 22m to 34m bgl. It should be highlighted however that these measurements recorded in Coal Authority reports are typically taken from various positions across the Site where information allows, and therefore the depths can be inaccurate / unrepresentative in places.

3.1.4 The CA report also records possible unrecorded shallow workings at the Site and indicates detailed extents of workings at the extreme south of the Site as *"Parent Phase"* workings, which indicate past or current mining. These worked areas in the extreme south of the Site are conjectured to represent the workings detailed in the Coal Authority Consultant's Report as at the level of the Yard Coal (63-71m depth) and the Unnamed 8 Coal (110m depth). Plans have not been provided for these workings due to their depth beneath the Site being out with anticipated influencing distance.

3.2. Review of Coal Authority's Mine Abandonment Plans

3.2.1 Searches of the mine abandonment plans based on the Site boundary area revealed two available shallow mine abandonment plans depicting former underground mine workings. The plans show workings within two seams of coal; the No. 1 (Unnamed 6), and the No. 2 (Two Foot) Coals, underlying the north-western extremity of the Site. Their searches also revealed seven abandonment plans pertaining to the former opencast mining within the land within the Site to the north of 'Gilgarran Road'. One of these plans details the entire opencast site and another six show detail of the seams encountered. The plans are reproduced in Appendix B.

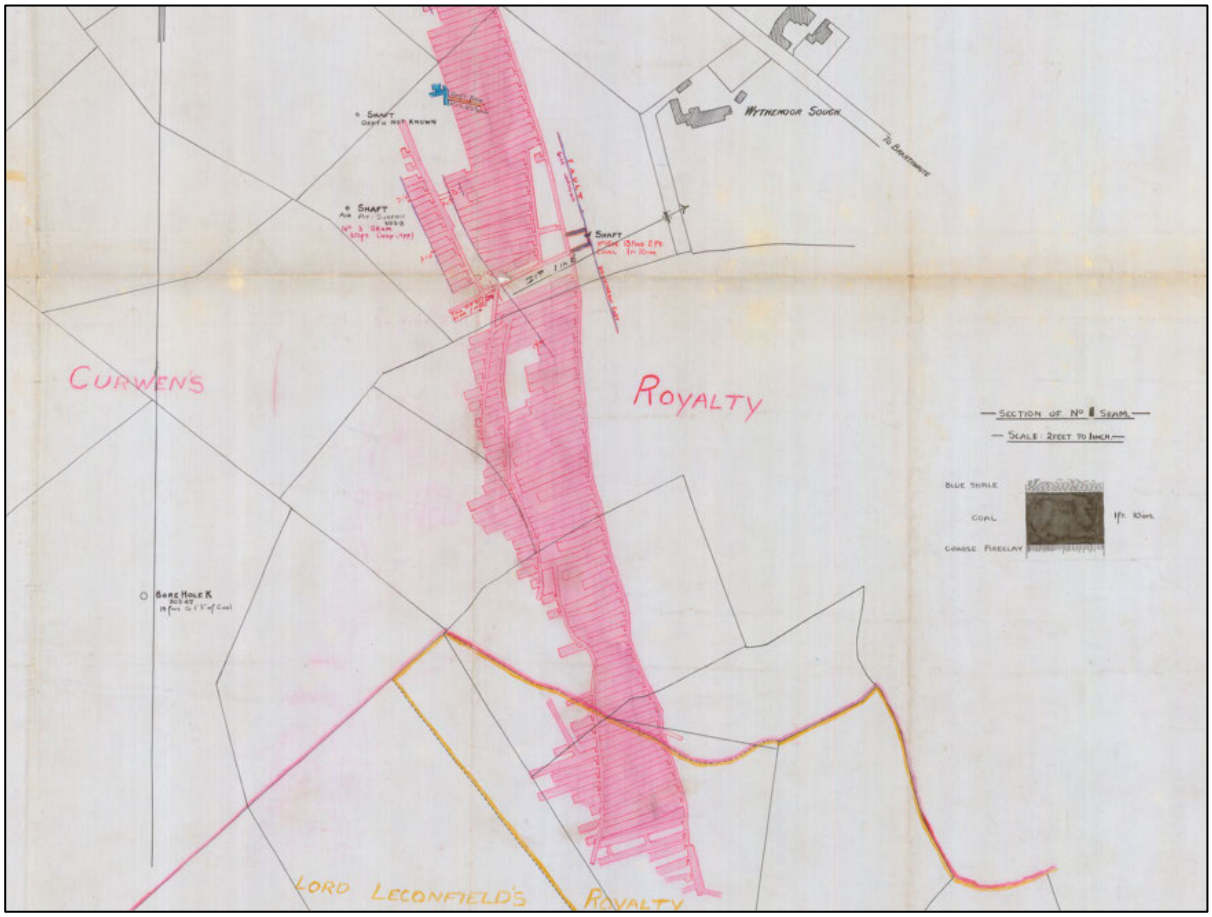
3.2.2 Mine abandonment plans provided for the No.1 seam and the No.2 seam indicate a dip of approximately 1 in 6 to the east northeast. Fault lines generally corresponding with those depicted on the BGS published geological map are noted to bound these workings to the south and northeast.

Mine Abandonment Plan Catalogue No. 7837 (1 of 3)

3.2.3 This available mine abandonment plan is entitled *"Wythemoor Colliery, Workington – No. 1 Seam Plan"*. The plan's title implies that the red coloured shading is the No. 1 (Unnamed 6) Coal which has been mined from the former Wythemoor Colliery. These workings are recorded to extend to within the boundaries of the Site and the immediately surrounding area, in particular at the northwestern extremity of the Site. It

is noted that workings within this area are largely accessed by the *"New Shaft"* near to Wythemoor Sough, which is understood to represent the shaft referenced 303524-004 on the Coal Authority Report and interactive map viewer. An extract of this plan is contained within Figure 3.1 below.

Figure 3.1: Extract of mineplan showing extents of workings at the level of the No.1 Coal.[8]



3.2.4 The mine plan does not provide dates for the workings, however a closure statement is included dated 16 October 1923, stating that the plan shows workings as completed up to 29 September 1921. Taking cognisance of these dates, it is likely that these workings will exhibit longwall style extraction methods, where the entire mineral vein is removed and allowed to collapse behind the working face. It is noted however that the southernmost area of mining shown on the plan is conjectured to

[8] Source: Coal Authority Mine Abandonment Plan 7837 (1 of 3). North arrow shown in top left corner, and cross section of worked seam included. Red line Boundary overlain.

represent stoop-and-room style workings (also known as pillar-and-stall workings), where corridors ("rooms") of coal are extracted, leaving *"stoops"* of intact coal, which are used to support the ceiling of the workings.

3.2.5 The mine plan also provides a sketch representing the cross-section of the No.1 seam and its typical extraction thickness. This cross section gives an extraction thickness of approximately 1ft 10in (0.55m). The seam is noted to be overlain by Blue Shale and the pavement comprises Coarse Fireclay. A depth of the seam beneath ground level is only provided at one location, approximately 200m west of the Site at the Wythemoor Sough shaft, which notes the seam to be present at 13fms[9] (approx. 24m) below ground level.

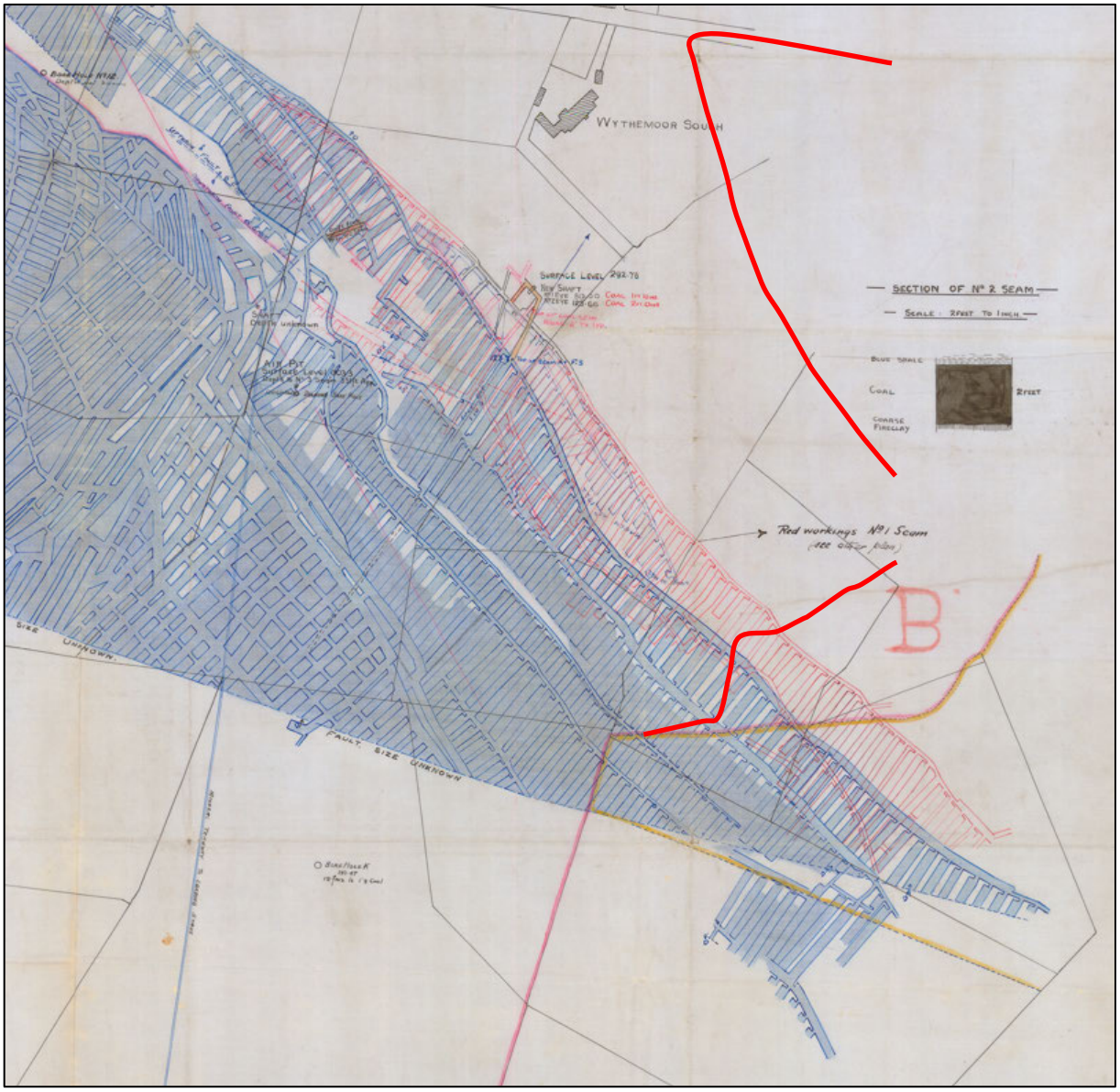
3.2.6 The mine abandonment plan shows that workings to the north of the Site, adjacent to Wythemoor Sough, are truncated at the east against a fault which generally correlates with BGS 1:50,000 geological map and BGS GeoIndex online viewer. A note regarding this feature on the mineplan is given as "*downthrown east*" although a magnitude of offset is not given. The plan also gives a dip value of 1 in 6 (approximately 9.5°) to the east northeast. No larger-scale geological structures are evident within the plan.

Mine Abandonment Plan Catalogue No. 7837 (2 of 3)

3.2.7 This available mine abandonment plan is entitled "*Wythemoor Colliery, Workington, 1904 – No.2 Seam Plan*". The plan's title implies that the blue coloured shading is the No.2 (Two Foot) Coal which has been mined from the former Wythemoor Colliery. These workings are recorded to extend to within the boundaries of the Site at the northern extremity and the immediately surrounding area. An extract of this mine plan is provided in Figure 3.2 below.

[9] Fathoms (fms) is an imperial measurement, primarily used to represent depth, and therefore is commonly used in historic mining documentation. It is the equivalent to 8 feet, or approximately 1.8m.

Figure 3.2: Extents of workings at the level of the No.2 seam.[10]



3.2.8 The mine plan does not provide dates for the workings, however a closure statement is included dated 16 October 1923, stating that the plan shows workings as completed up to 30 June 1922. As above, it is likely that these workings will exhibit longwall style extraction methods, where the entire mineral vein is removed and allowed to collapse behind the working face. As before, however, it is conjectured that an area along the northeast of the workings represent stoop-and-room style workings (also known as pillar-and-stall workings), where corridors ("rooms") of coal are extracted,

[10] Source: Coal Authority Mine Abandonment Plan 7837 (2 of 3). Red line boundary overlain.

leaving “stoops” of intact coal, which are used to support the ceiling of the workings.

3.2.9 A small cross section showing the extraction thicknesses of the worked seam is given in this plan. It would appear that coal thickness here is approximately 2ft (0.61m). This cross section shows that the ceiling of the working comprises Blue Shale, and the pavement comprises Coarse Fireclay. A depth of the seam beneath ground level is only provided at two locations location, approximately 200m west of the Site at the Wythemoor Sough shaft and approximately 600m west of the Site, which notes the seam to be present at 167 feet (approx. 51m) and 11 fms (approx. 20m) below ground level, respectively.

3.2.10 As with the previous plan, this document does not provide any great deal of information pertaining to the geological structure of the region. However, the workings are noted to be bound to the south and the northeast by two faults, which generally correlate with faults recorded on the BGS geological map of the region. The large fault which bounds the working to the south is unknown in scale with regards to downthrow. A smaller fault, which does not appear to be represented on the BGS maps, is shown off-Site approximately 125m to the northwest, showing an upthrow to the northeast of 6 inches. This feature seems to separate two different phases of extraction.

Mine Abandonment Plan Catalogue No. 16661 (1 of 7 – 7 of 7)

3.2.11 Completion plans pertaining to the Potatopot Opencast Mine were provided by the Coal Authority and comprised a total of 7 plans (Nos. 16661 1, 2, 3, 4, 5, 6, and 7 of 7) recording workings within the boundaries of the Site at the level of the Tenquarters, Rattler, Bannock Top Level, Bannock Bottom Level, Yard, Lower Yard, Half-yard, Little Main, Lickbank, Sixquarters, Upper Threequarters, Lower Threequarters coal seams. The plans provided include a summary plan which depicts all the workings and their extents (reference 16661 1 of 7, Appendix B) discussed further below.

3.2.12 Plan 16661 *"Potatopot Completion Plan"* indicate the opencast operation was authorised on 16 October 1985 and "Coaling" or mining commenced on 1st July 1986. Mining was indicated as complete by 14 July 1993. The plans indicate bituminous coal was worked in a total of 12 Coal seams to a maximum depth of approximately 76m below ground level (119.7m AOD). Within the Site boundaries, all 12 seams have been targeted by the opencast mining operations, although they seem to have been extracted in localised areas. No specific details of backfill are included on the plan apart from reference to "Uncompacted" which would indicate that the materials were not placed in an engineered fashion. The thickness of the backfill deposits is noted to be in the region of up to 75m.

3.2.13 Taking cognisance of the depth of the seams to the top of batter recorded on the plans, side slopes can be expected to have been cut at angles of potentially up to 63°. Is should be noted that these figures are indicative only, as variations in the location of the highwall or the seam pavements may not be recorded on the plan. Similarly, changes of gradient across the headwall cannot be accounted for.

3.2.14 No mine entries are noted to be present within the opencast area recorded on the opencast completion plan. However, it is known from the Coal Authority report and the underground mine abandonment plans that shafts are present in the vicinity of the Site. It is possible, however, that the opencasting activity at Potatopot mine has either truncated these shafts or removed them in their entirety.

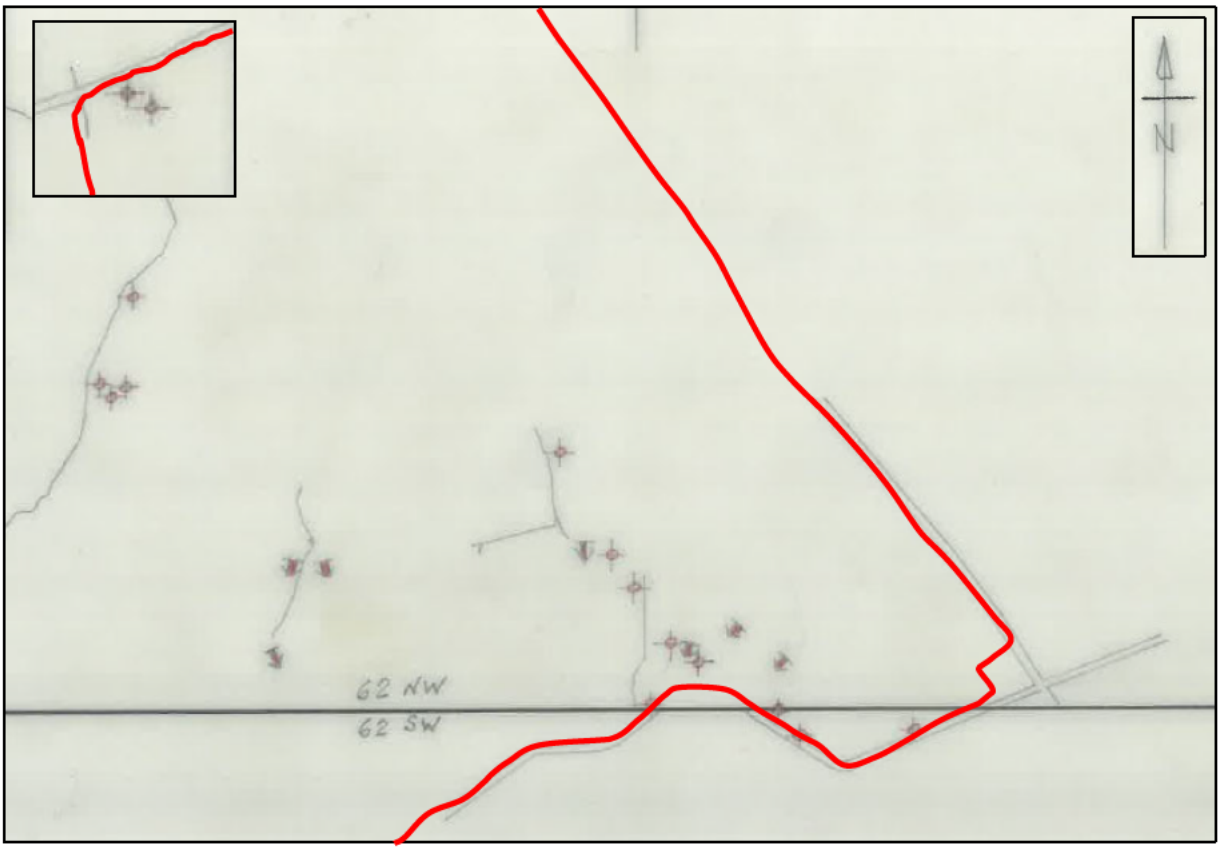
3.2.15 No stratigraphic column is included within this completion plan, although the mined seams listed in the legend is noted to have the seams presented in their correct stratigraphic order, from shallowest to deepest. An extract of this completion plan is included within Appendix B.

Mine Abandonment Plan Catalogue No. NCB62NW (Shaft Plan)

3.2.16 During consultation with the Coal Authority in regard to mine plan availability within this region, it was highlighted that the CA were in possession of a Shaft File for this Site, which is one of a series of

documents inherited from British Coal which shows mine entry locations. An extract of the plan is shown in Plate 3 below, and this is what the CA used for the positioning of shafts onto their interactive map viewer. Further description of shafts and other mine entries is provided in Section 4 below. The location of these shafts is shown on Figure 3.3.

Figure 3.3: Plan showing locations of shafts and adits within the south of the Site. Insert at top left includes the shafts at northwestern extremity of the land within the Site to the south of 'Gilgarran Road'.[11]



3.3. Natural Cavities and Non-Coal Mining

Non-Coal Mining Data

3.3.1 A search of the Mining Cavities Database indicated that the nearest mining cavity location lies approximately 4.52km to the east. The database does not provide any information on the feature other than its position, which is understood to be close to Sosgill farm, near Mockerkin.

[11] Source: Coal Authority Mine Abandonment Plan NCB62NW. North arrow shown in top right corner. Red line boundary overlain.

3.3.2 A search of the BGS Mine Plans Portal[12] and via the BGS the non-coal mining plans database[13] was undertaken by the author. This search revealed a series of 343 mine plans within the Site, however consultation with the BGS indicates these to be wrongly attributed. There are no further records within the vicinity of the Site.

3.3.3 The potential for non-coal mining related activities to affect the Proposed Development is considered to be negligible.

Natural Cavities

3.3.4 A search of the Natural Cavities Database indicated that there is one natural cavity recorded approximately 2.75km to the west of the Site in Distington. This feature is noted to pertain to a swallow hole type feature formed in a unit of Carboniferous Limestone.

3.3.5 The potential for naturally occurring cavities to affect the Proposed Development is considered to be negligible.

3.4. Quarries

3.4.1 A review of the historical maps has revealed that there are some small-scale surface quarrying operations which have been undertaken locally within the land to the south of 'Gilgarran Road', conjectured to pertain to the extraction of sandstone towards the southern boundary, where bedrock is close to the surface. Findings from the walkover and historical map review note a large quarry to the east of the Thief Gill near the southern boundary of the land within the Site to the south of the 'Gilgarran Road', and a small pit excavation in the land within the Site to the southwest of the 'Gilgarran Road'.

3.4.2 No further non-coal quarries are noted to be present on-Site.

[12] BGS Non-coal mining plans. Available [redacted] Accessed April 2023
13 BGS Non-coal mining plans database. Available at: [redacted] Accessed April 2023

4. Hazard Assessment

4.1. Mining Hazards

4.4.1 Figure 4.1 illustrates the location and extent of the various mining related features and potential hazards. A summary of these features is provided in the following section.

4.2. Mine Entries

4.2.1 The CA Mine Abandonment Plans and CA Consultants Report reviewed by the author reveal twenty-seven recorded mine entries on the Site and five further neighbouring the study area close to the northwestern, western, and southern boundary line. These recorded mine entries are summarised in Table 4.1.

4.2.2 There are numerous off-Site mine entries surrounding the Site to the north, east and south, labelled as coal pits in historical maps, however these are conjectured to lie at sufficient distances from the Site that they are unlikely to pose a hazard within the Site and are omitted from below.

Table 4.1: Summary of Mine Entries

CA Shaft Reference	Approximate Easting	Approximate Northing	Remarks
303522-001	303957	522609	Adit style entry.
303523-004	303937	523392	Shaft style entry.
303523-005	303965	523372	Shaft style entry.
303524-004	303488	524781	Shaft style entry. Shaft noted to have been filled with colliery debris before 1957. May have been partially or wholly removed by opencasting.
304522-001	304466	522973	Shaft style entry.
304522-002	304419	522974	Shaft style entry.
304522-003	304438	522952	Shaft style entry.
304522-004	304725	522679	Adit style entry.
304522-005	304777	522680	Adit style entry.

CA Shaft Reference	Approximate Easting	Approximate Northing	Remarks
304522-006	304714	522532	Adit style entry.
304523-001	304414	523994	Adit style entry. May have been partially or wholly removed by opencasting.
304523-002	304247	523919	Shaft style entry. Shaft noted to have been filled to an unknown specification prior to 1957. May have been partially or wholly removed by opencasting.
304523-003	304314	523896	Shaft style entry. Shaft noted to have been filled to an unknown specification prior to 1957. May have been partially or wholly removed by opencasting.
304523-004	304476	523885	Shaft style entry. May have been partially or wholly removed by opencasting.
304523-005	304466	523823	Shaft style entry. May have been partially or wholly removed by opencasting.
304523-006	304472	523112	Shaft style entry.
304524-001	304400	524429	Shaft style entry. May have been partially or wholly removed by opencasting.
305522-001	305152	522846	Shaft style entry.
305522-002	305197	522701	Adit style entry.
305522-003	305239	522686	Shaft style feature.
305522-004	305267	522635	Shaft style feature.
305522-005	305337	522543	Shaft style feature.
305522-006	305362	522540	Adit style entry.
305522-007	305432	522562	Adit style entry.
305522-008	305510	522516	Adit style entry.
305522-009	305295	522451	Shaft style entry.
305522-010	305488	522424	Shaft style entry.
305522-011	305536	522387	Shaft style entry. Filled to an unknown specification prior to 1957.
305522-012	305712	522394	Shaft style entry.

CA Shaft Reference	Approximate Easting	Approximate Northing	Remarks
305522-013	305248	522359	Shaft style entry.
305522-014	305206	522345	Shaft style entry.
305522-015	305605	522298	Shaft style entry.

4.2.3 The presence and surface expression of the above features was considered during the walkover. Shaft reference 305522-009 was readily identifiable at the surface as a topographic depression with ponded water present at the time of the walk over. Smaller topographic depressions were also noted in the location of shafts 305522-010 and 305522-011. Hummocky ground was noted in the vicinity of shafts referenced 304522-001 and the cluster of shafts referenced 304522-001, 304522-002, and 304522-003, which may pertain to settlement of these features, or even the stockpiling of materials during coaling operations. The areas of hummocky ground and surface disturbance observed as part of the walk over is illustrated on Figure 2.1.

4.2.4 Given the mining setting, known mine entries on-Site and the anticipated ground conditions, it is considered that the possibility exists of unrecorded mine entries, day holes, and/or shallower bell pits to be present across the Site.

4.2.5 The precise location and status of the recorded shafts and adits are unconfirmed and the potential for ground movement to occur as a result of these features remains present. Furthermore, there remains potential for other, unrecorded, mine entry features to be present across the Site.

4.3. Shallow Mine Workings

4.3.1 Historical records indicate that coal workings extend beneath the Site, but recorded workings appear to be limited to deeper horizons. It is also considered likely that unrecorded workings are also present and that such workings could be within the near surface horizons.

4.3.2 In any area of shallow recorded or unrecorded stoop-and-room mining the maximum height of void migration is typically directly proportional to the thickness of seam mined and inversely proportional to the change in volume associated with any collapsed material. The height of collapse in pillared workings may be frequently proportional to the width of the excavation and the larger the span, the more likely collapse is to occur. The maximum height of void migration might extend to 10 times the height of the original room dimension. However, it is generally more likely to be 3 to 5 times the room height where more competent strata overlie the workings. The presence of surface water features and saturated overburden can accelerate / increase void migration, extending to 18 times the seam/strata thickness in exceptional cases.

4.3.3 In the land with the Site to the north of 'Gilgarran Road', where opencast has been undertaken, shallow mining will have been removed. However, in those parts of the Site that boarder the opencast, there will remain potential for shallow workings to be present.

4.3.4 In the land within the Site to the south of 'Gilgarran Road', evidence of mine workings at shallow levels is present in the form of mine shafts/adits. No mine plans are available pertaining to coal mining in this area, however it is possible that unrecorded mine workings extend from these features. From BGS and CA information, it is assumed that workings may be present at the level of the Tenquarters, Rattler, Bannock Top Level, Bannock Bottom Level, Yard, Lower Yard, Half Yard, Little Main, Lickbank, Sixquarters, Upper Threequarters, and Lower Threequarters Coal seams, which are noted to outcrop within the land to the south of 'Gilgarran Road'. Figure 4.1 illustrates the areas where these seams are mapped at outcrop / subcrop together with an estimate of the extent of where seams might be present within the 10x seam thickness horizon.

4.3.5 Whilst there is no direct evidence of recorded workings being present in these areas, the potential for ground subsidence / collapse to occur in these areas as a result of unrecorded workings will require consideration as part of future development at the Site.

4.4. Opencast Infill and Made Ground

4.4.1 Most of the land within the Site to the north of 'Gilgarran Road' has been subject to previous opencast mining and subsequent backfill. In addition, in the adjoining surrounding area BGS mapping shows Made Ground to be present (of unknown thickness and composition). In these areas there is potential for ground settlement to occur as a result of ongoing consolidation of historical backfill / Made Ground, and as a result of any new structure loads induced by new development. In the context of the proposed solar arrays and infrastructure, such settlements are unlikely to be significant hazards. However, in the context of any proposed buildings, settlement will require consideration as part of design to ensure appropriate foundation solutions are defined. In particular, the potential for differential settlement to occur at the location of the buried opencast pit highwall may require specific consideration.

4.5. Mine Water Rebound and/or Breakout

4.5.1 Flooding of the shallow abandoned mine workings underlying the Site is considered feasible, given possible shallow groundwater and the likely cessation of any mine dewatering program. It is likely that there is connectivity between the known mine entries and the abandoned mines underlying the Site, thus creating a preferential pathway for possible groundwater/mine water breakouts.

4.5.2 The probability of occurrence and hazards associated with mine water rebound and/or breakout impacting the Proposed Development is limited considering the geomorphology of the Site, the current groundwater regime and the nature of the Proposed Development.

4.6. Mine Gas

4.6.1 As an intrinsic hazard associated with former subsurface mine workings, the generation and migration of mine gas should be assessed as part of a proposed new development. CL:AIRE document "*Good Practice for Risk Assessment for Coal Mine Gas Emissions"* released in 2021 provides guidance on the assessment of coal mine gas risk at development sites.

This document highlights that mine gas generation and migration is site-specific and requires attention into the development of a Conceptual Model with site-specific parameters, able to test any source-pathway-receptor linkages.

4.6.2 Consequently, the author has taken cognisance of the desktop research undertaken at the Site and the likely ground conditions, and presented possible sources, pathways, and receptors which could be foreseeable at the Proposed Development and the likelihood of any linkages that could arise.

Sources

4.6.3 The probability and hazard of methane generation within the underlying seams is considered to be limited, given that coal mining is noted by the Coal Authority to have ceased by 1922. This would indicate that the walls of the mineworking have had significant time to desorb the associated methane gas and that any further desorption is anticipated to be minor. Although it is possible that unrecorded mine workings are present at the Site, it is assumed that these are unrecorded as their working predates the requirement to keep mining records and it is therefore anticipated that any unrecorded mine workings would also have had a significant amount of time to desorb any near-surface methane.

4.6.4 With regards to carbon dioxide gas generation, it is noted that there is a potential for carbon dioxide generation given the assumed interconnectedness of the various coal seams, their proximity to the surface, and a number of mine entries recorded within proximity to the Site which could provide a constant recharge of the oxygen required to oxidise the carbon within the seam walls. This recharge of oxygen gas could theoretically sustain the generation of carbon dioxide in the seams for a long period of time.

4.6.5 Information pertaining to the existing groundwater table at the Site is limited. Consequently, as a conservative approach to the consideration of mine gases, it is assumed that shallow mine workings and mine entries

are not entirely flooded, and this cannot at present be suggested to form a barrier to mine gas migration or generation.

4.6.6 The Coal Authority note that all coal seams within the Cumberland Coal Field have the potential for spontaneous combustion where *"roof coal"* is left by incomplete removal of the coal. The condition of worked seams at the Site is unconfirmed, but it is considered reasonable to assume that significant quantities of residual roof coal is unlikely given the limited thickness of the target coal seams themselves.

Receptors

4.6.7 The Proposed Development for the Site have identified human health as the main on-Site receptor. The risk to human health from mine gas is only expected to become an issue when indoors and the internal land uses associated with the Proposed Development are limited to only the sub-station / battery storage buildings. In the event that underground utilities / chambers are also proposed then such features may be a significant receptor, given that there is a potential for such chambers to accumulate potentially explosive or asphyxiant gases.

Pathways and Barriers

4.6.8 Taking cognisance of the above sources and receptors, the development of a reasonably foreseeable pathway between the two needs to be in place for there to be an associated risk. The major pathways for mine gas transport would be considered to be the open, interconnected mine workings and the associated mine entries. It is therefore considered that any mine gas generation would have a preferential pathway up seam and through these entry shafts or mining induced fissures, faults or ground collapse to the surface. Similarly, any coal outcrops could present an escape pathway. Any gas release at the surface would therefore be considered to be concentrated around these features.

4.6.9 The presence of the backfilled opencast coal pit in the land within the Site to the north of the 'Gilgarran Road' is potentially facilitative to mine gas migration to the surface also.

4.6.10 The potential for migration of mine gas to the surface through the glacial till superficial strata, where present, is reduced given that these comprise weakly permeable strata which would be largely restrictive to gas migration. However, mine induced fissures, ground collapse and mine entries are anticipated to cross cut these deposits and may still present a pathway despite their low permeability.

4.6.11 Shallow seams at the Site may be exposed to surface air flow through break lines and fissures in the shallow superficial and solid strata, or through weathering processes at rockhead. It is considered however that generation of methane in this way would have been ongoing for a long time and consequently any desorption of methane will be negligible.

Summary

4.6.12 Whilst the Site may have potential to generate mine gases, and for such gases to be transmitted along possible pathways, the potential for significant ground gas volumes / concentrations to be generated is considered to be limited. Furthermore, where solar arrays and associated infrastructure are proposed there are no enclosed spaces and therefore no potential for gas accumulation to occur. Where any buildings and / or buried chambers are proposed, then assessment of gas risk will be necessary as part of the design process.

5. Mitigation of Mining Hazards

5.1.1 Whilst mining related hazards are present at the Site, the Proposed Development is of a relatively low sensitivity and mitigation measures necessary to facilitate the development can be considered accordingly. Further description of the approaches considered applicable is provided in the following section.

5.1.2 The following mitigation options may be considered.

The 'Do nothing' or reactionary approach

5.1.3 Planning guidance identifies solar arrays as a land use that does not specifically require assessment of coal mining risks given the relatively low sensitivity of the land use. However, assessment is identified as a requirement for the associated access roads and any buildings given the more sensitive use / value of these features. Furthermore, given the nature of the Site with numerous mine entries recorded on the Site and the potential for unrecorded entries and shallow works considered to be high, consideration of stability hazards and definition of development constraints and / or mitigation is considered appropriate for the proposal in general.

Avoidance of hazards

5.1.4 Where possible the development infrastructure should seek avoid areas of highest hazard. With regards to recorded mine entry features, solar arrays, roads and buildings should avoid these locations. With regards to areas where shallow mining hazard has been identified development should, ideally, seek to avoid these areas where possible – where this is not possible then then further investigation / assessment of hazard will be necessary.

Mine entries

5.1.5 Any mine entries (shaft and adits) recorded or suspected to exist within at least 20m of the development infrastructure footprint, will require investigation. Features should be located by a combination of geophysical surveys, strip trenching and probing, with the associated hazards, risks of

collapse and subsidence potential, assessed. Where required, shafts / adits should be treated to provide long term stability appropriate to support the land use propose. It is likely that treatment would comprise a combination of reinforced concrete capping and grouting.

Shallow mine workings

5.1.6 Development in areas where potential for shallow mine related hazards has been identified will require ground investigation to confirm the conditions present. A combination of geophysical and intrusive investigation will be required to confirm presence / absence of mine workings. In the event that shallow mine workings are encountered beneath Proposed Development then stabilisation measures may be necessary to support the proposed construction / operation of the development. If necessary, such measures would be designed to backfill any voids and consolidate any disturbed ground using grouts / slurries.

Former Opencast Area

5.1.7 Where development is proposed in the area of the former opencast mine in the land within the Site to the north of 'Gilgarran Road', there will remain potential for ground settlement to occur, and in particular for differential settlement to occur around the buried quarry highwall. In the context of a proposed solar farm, it is considered unlikely that such conditions would present a constraint to the development. However, if buildings or infrastructure is proposed that is sensitive to ground settlement / differential settlement then investigation of these areas will be necessary to confirm ground conditions and to inform appropriate ground improvement / design.

Construction

5.1.8 Given the Site lies within a former mining setting, it is considered likely that unrecorded mine entries and / or unrecorded mine workings will be present on the Site. Caution should be maintained throughout the construction work for any signs of such features such that appropriate measures can be put in place in the event that stability risks are identified.

6. Essential Guidance for Report Readers

6.1.1 This report has been prepared within an agreed timeframe and to an agreed budget that will necessarily apply some constraints on its content and usage. The remarks below are presented to assist the reader in understanding the context of this report and any general limitations or constraints. If there are any specific limitations and constraints, they are described in the report text.

6.1.2 The opinions and recommendations expressed in this report are based on statute, guidance, and best practice current at the time of its publication.

6.1.3 Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third-party data used. Historical maps and aerial photographs provide a *"snap-shot"* in time about conditions or activities at the Site and cannot be relied upon as indicators of any events or activities that may have taken place at other times.

6.1.4 The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the Site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be considered in any analysis and reporting.

6.1.5 It should be noted that this report is a land condition assessment and does not purport to be an ecological, flood risk or archaeological survey and additional specific surveys may be required.

6.1.6 This report has been written for the sole use of the Applicant stated at the front of the report in relation to the Proposed Development. The conclusions and recommendations presented herein are only relevant to the Proposed Development. This report shall not be relied upon or

transferred to any other party without the expressed written authorisation of the author. Any such party relies upon the report at its own risk.

6.1.7 The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not considered the perceptions of, for example, banks, insurers, other funders, lay people, etc., unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

6.1.8 Public or legal consultations or enquiries, or consultation with any Regulatory Bodies (such as the Environment Agency, Natural England or the Council) have taken place only as part of this work where specifically stated.

Figures

N

Existing Building

Subsidence Feature

Northern Parcel

Felled woodland and timber piles

Bannock Row Farm

Wind Turbine WTG1

Rotting organic material storage

Wind Turbine WTG2

Fly tipping

Wind Turbine WTG3

Culvert/Drain

Culvert/Drain

Branthwaite Rigg Farm

Culvert

Rigg House

Culvert/Drain Structure unknown

Vehicle bridge and culvert

Footbridge

Materials Storage and Stockpiles/ Tracked Excavator

Footbridge

Footbridge

Vehicle bridge and culvert

Footbridge

Footbridge

Footbridge

Culvert

Footbridge

Potentially asbestos-containing materials

Potentially asbestos-containing materials

Material Storage area

Exposed Bedrock - Sedimentary Strata

Hummocky Ground - possible mineshafts

Vehicle bridge and culvert

Southern Parcel

Humocky Ground - possible mineshafts

Vehicle bridge and culvert

Footbridge

Quarry

Vehicle bridge and culvert

Possible mineshaft

Odour noted in outfall

Standing Stones - Heritage Site

Quarry Face

Thief Gill

Culvert

Surface depression - possible mineshaft

0 50 100 150 200 250 300 350 400 450 500m

SCALE 1:5000

Legend

- Approximate Site Boundary
- Drainage Ditch
- Pond/Surface Water
- Overhead Power Cable
- Pylons
- Assumed Underground Power Cables
- Wind Turbine
- Steep Banking and visual evidence of Slope Failure
- Platformed/Filled land - gravel set-down area
- Photo location

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

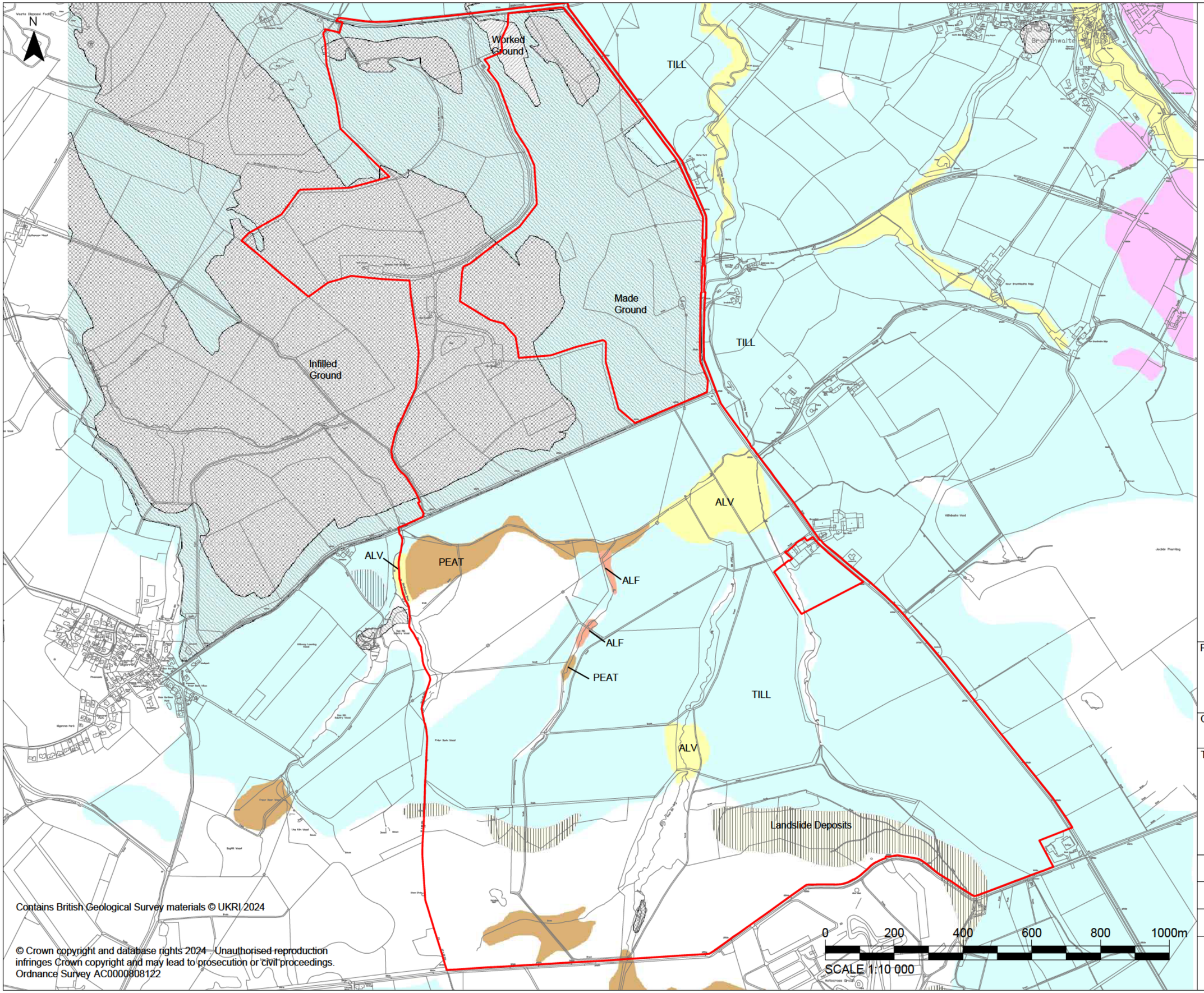
Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Site Layout Plan and
Site Reconnaissance Observations

Scale: 1:5000 @ A1	Date: 16/10/2024
Drawn: davco	Checked: NH
Figure: 2.1 Sheet 1 of 1	Rev: A

Stantec



Legend

- Approximate Site Boundary
- Made Ground
- Infilled Ground
- Worked Ground
- Landslide Deposits
- ALV Alluvium
- TILL Till
- PEAT Peat
- ALF Alluvial Fan Deposits

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Superficial Geology

Scale: 1:10 000 @ A3	Date: 16/10/2024
Drawn: davco	Checked: NH
Figure: 2.2 Sheet 1 of 1	Rev: A

Stantec

N

PMCM

PLCM

PMCM

PMCM

PMCM

PMCM

PMCM

PMCM

PMCM

SMGP

PMCM

BK

WS

Contains British Geological Survey materials © UKRI 2024

0 200 400 600 800 1000m

SCALE 1:10 000

Legend

- Approximate Site Boundary
- WS — Whitehaven Sandstone Formation
- PMCM — Pennine Middle Coal Measures Formation - Mudstone Siltstone and Sandstone
- PMCM — Pennine Middle Coal Measures Formation - Sandstone
- SMGP — Stainmore Formation
- PLCM — Pennine Lower Coal Measures Formation
- BK — Brockram - Breccia
- Coal Seam (inferred)
- Fault
- Glacial Meltwater Channel

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Bedrock Geology

Scale: 1:10 000 @ A3	Date: 16/10/2024
Drawn: davco	Checked: NH
Figure: 2.3	Sheet 1 of 1 — Rev: A

Stantec

N

303524-004
304524-001
304523-002
304523-002
304523-003
304523-004
304523-005
303523-004
303523-005
304523-006
304522-002
304522-001
304522-003
304522-001
305522-002
305522-003
305522-004
305522-007
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305522-008
305522-005
305522-010
305522-009
305522-012
305522-011
305522-014
305522-013
305522-015
304522-005
304522-004
304522-006
303522-001

0 200 400 600 800 1000m

SCALE 1:10 000

Legend

- Order Limits
- Area where coal seams are mapped close to ground level and potential for unrecorded shallow coal mining presents a possible stability hazard
- Location of recorded mineshafts
- Location of recorded mine adit
- Worked Ground associated with former opencast mine and associated backfill
- Anticipated location of buried opencast boundary / high wall

Project Title

Dean Moor Solar Farm

Client

FVS Dean Moor Limited

Title

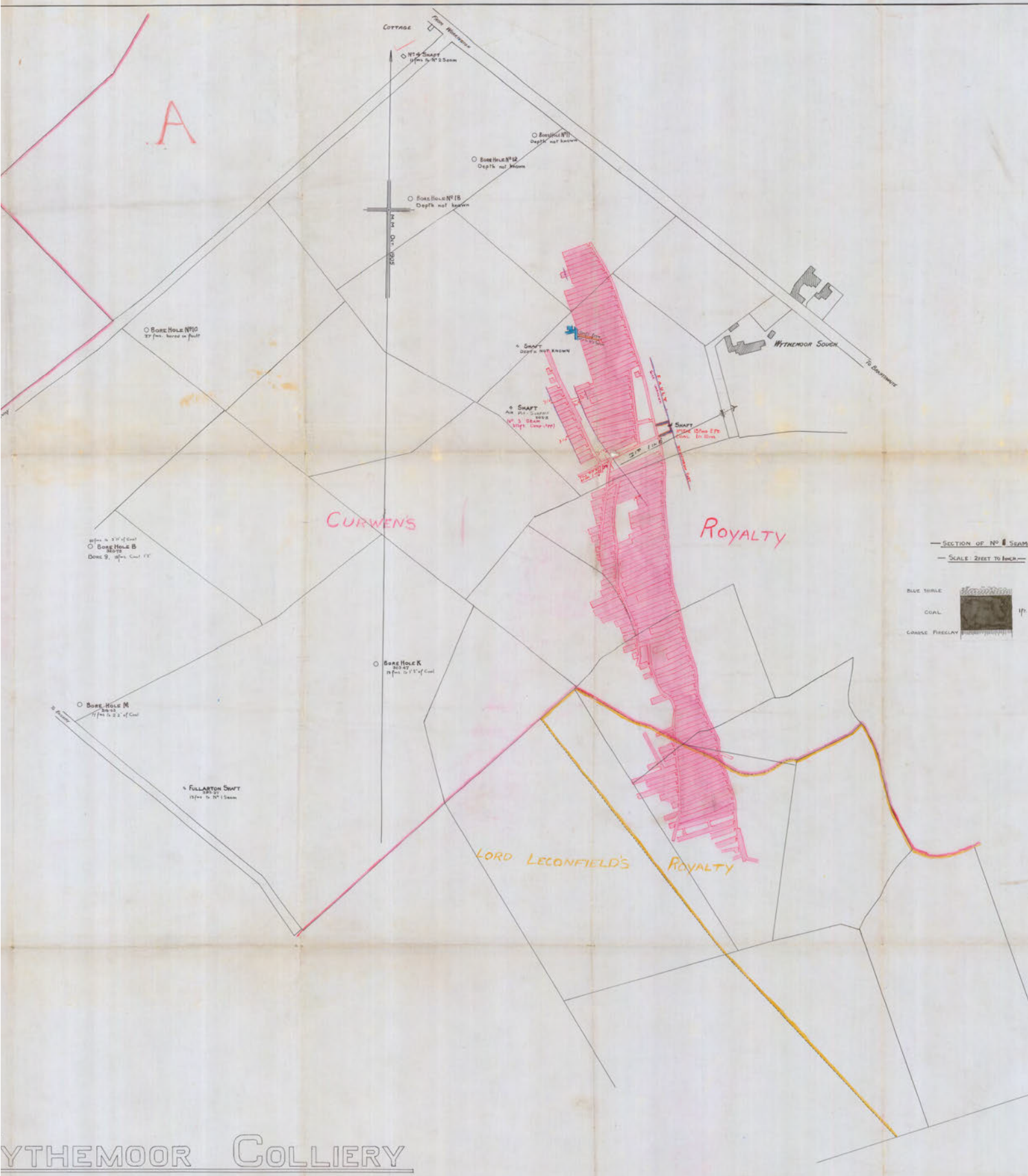
DEAN MOOR SOLAR FARM
DEVELOPMENT CONSENT ORDER

Mining Hazard Plan

Scale: 1:10000 @ A3	Date: 16/10/2024
Drawn: davco	Checked: NH
Figure: 4.1	Sheet 1 of 1 / Rev: A

Stantec

Appendix A Consultant's Coal Mining Report



YTHEMOOR COLLIERY

WORKINGTON

No. 1 SEAM PLAN 7837

SCALE :- 2 CHAINS = 1 INCH.

THIS PLAN IS A TRUE
WORKING PLAN OF TH
UP TO 29TH SEPTEMBER
THOROUGH EXAMINATION
THE BEST OF MY KNOWL
ACCURATE PLAN OF T

7837/1

-WYTHEMOOR COLLIERY-

-WORKINGTON-

-1904- 7837

No. 2 SEAM PLAN.

SCALE :- 2 CHAINS = 1 INCH

7837

Legend

- SITE BOUNDARY (Centre of symbol to be taken as boundary of site)
- PERIMETER OF BATTER
- POSITION OF KNOWN OR SUSPECTED SHAFT
- OLD WORKINGS (Seam Colour)

AREA OF SEAM WORKED (with seam code) IN GEOLOGICAL DESCENDING ORDER

- TENQUARTERS
- RATTLER
- BANNOCK-TL
- BANNOCK-BL
- YARD
- LOWER-YARD
- HALF-YARD
- LITTLE-MAIN
- LICKBANK
- SIXQUARTERS
- UPPER-THREEQUARTERS
- LOWER-THREEQUARTERS

NOTES

Shafts (51 etc.) Refer to Shaft Register

Site Bench Mark	E	N	L
WYTHEMOOR SOUGH	303740	524893	84.741M

LAND TYPE AND USAGE

BEFORE OPERATIONS: LOW-QUALITY AGRICULTURE + WOODLAND

AFTER RESTORATION: AGRICULTURE,AMENITY + WOODLAND

DETAILS OF OVERBURDEN: GLACIAL-DRIFT,MUDSTONE + SANDSTONE

DETAILS OF BACKFILL: UNCOMPACTED

NATURE OF COAL: BITUMINOUS

OPERATIONAL DATES

AUTHORISED: 9th OCTOBER 1985

COALING COMMENCED: 1st JULY 1986

COALING COMPLETED: 14th JULY 1993

PLANS ISSUED:

BRITISH COAL OPENCAST

16661

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME: POTATOPOT

TITLE: COMPLETION-PLAN

COUNTY	DISTRICT	CIVIL PARISHES
CUMBRIA	ALLERDALE COPELAND	DEAN WINDSCALES & DISTINGTON

LOCATION: 8 Kilometers South East of Workington

O.S. SHEETS USED Prefix NY

NY	0225	0325	0425
NY	0224	0324	0424
NY	0223	0323	0423

Drawn by D.MCSSENGER Date JUN1994

Checked by S.EDWARDS Date 14/07/94

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME

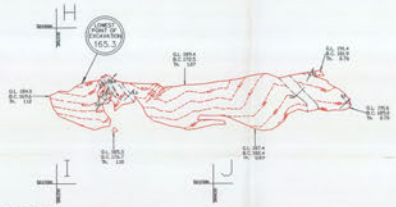
POTATOPOT

TITLE

COMPLETION PLAN

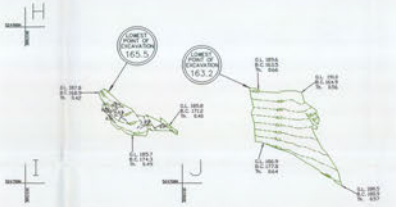
SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by: D.Messenger Date: 14-04-94	Checked by: S. Edwards Date: MAY 1994
Scale: 1:2500	Sheet: 2 of 7
Drawing No.: CP2720b	

16661



TENQUARTERS

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS ——



RATTLER

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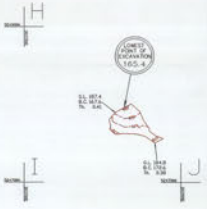
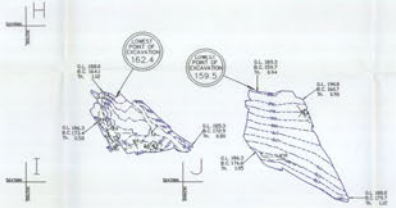


BANNOCK TL

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS ——



BANNOCK BL

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS ——

16661

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME
POTATOPOT

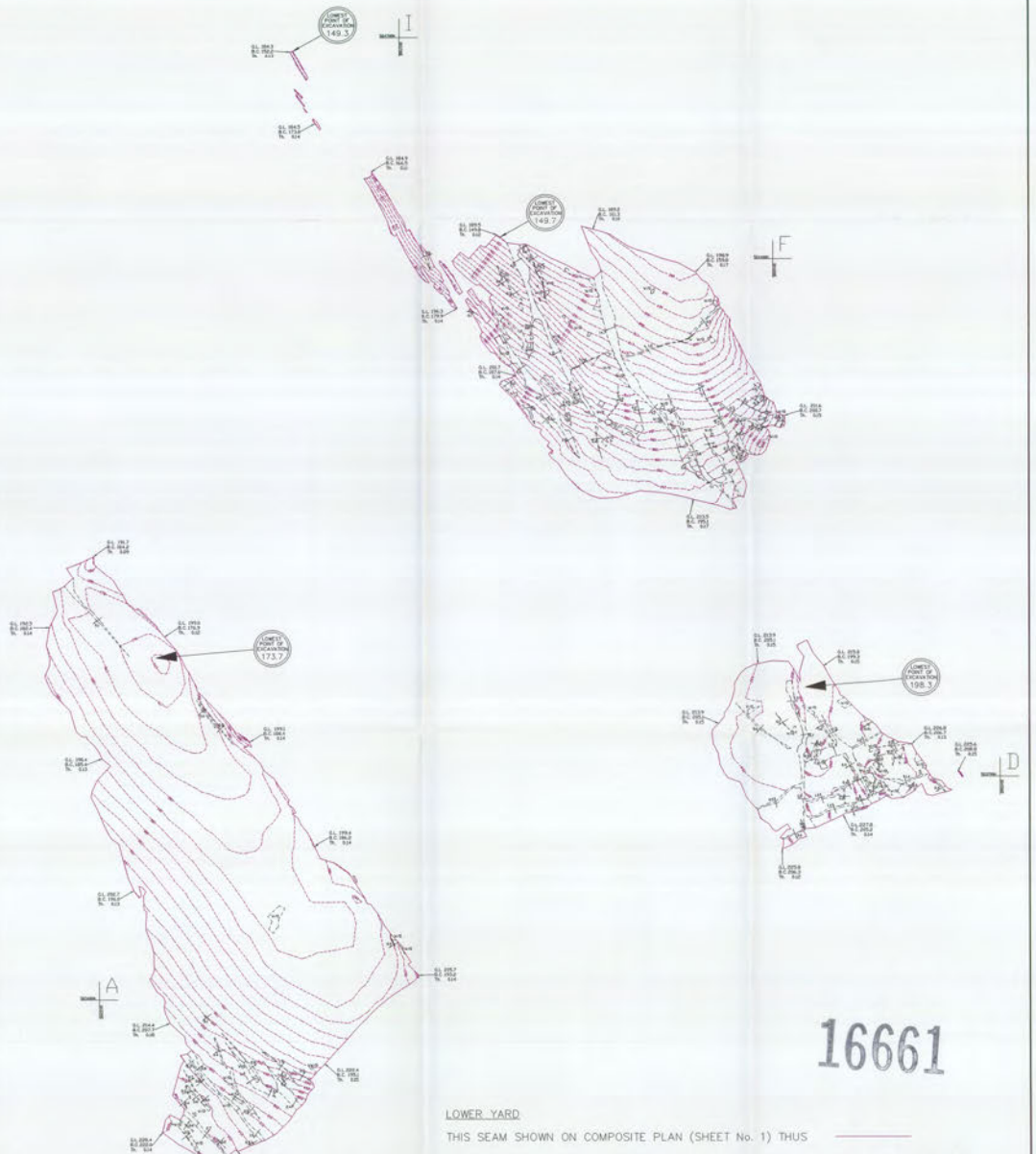
TITLE
COMPLETION PLAN

SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by Date: D.Messenger 15-04-94	Checked by Date: S. Edwards MAY 1994
Scale: 1:2500	Sheet 3 of 7
Drawing No: CP2720c	

16661

YARD BOTTOM–LEAF

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS ——



16661

LOWER YARD

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS ——

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME

POTATOPOT

TITLE

COMPLETION PLAN

SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by: D.Messenger Date: 22-04-94	Checked by: S. Edwards Date: MAY 1994
Scale: 1:2500	Sheet 4 of 7
Drawing No. CP2720d	

16661

HALF-YARD

16661

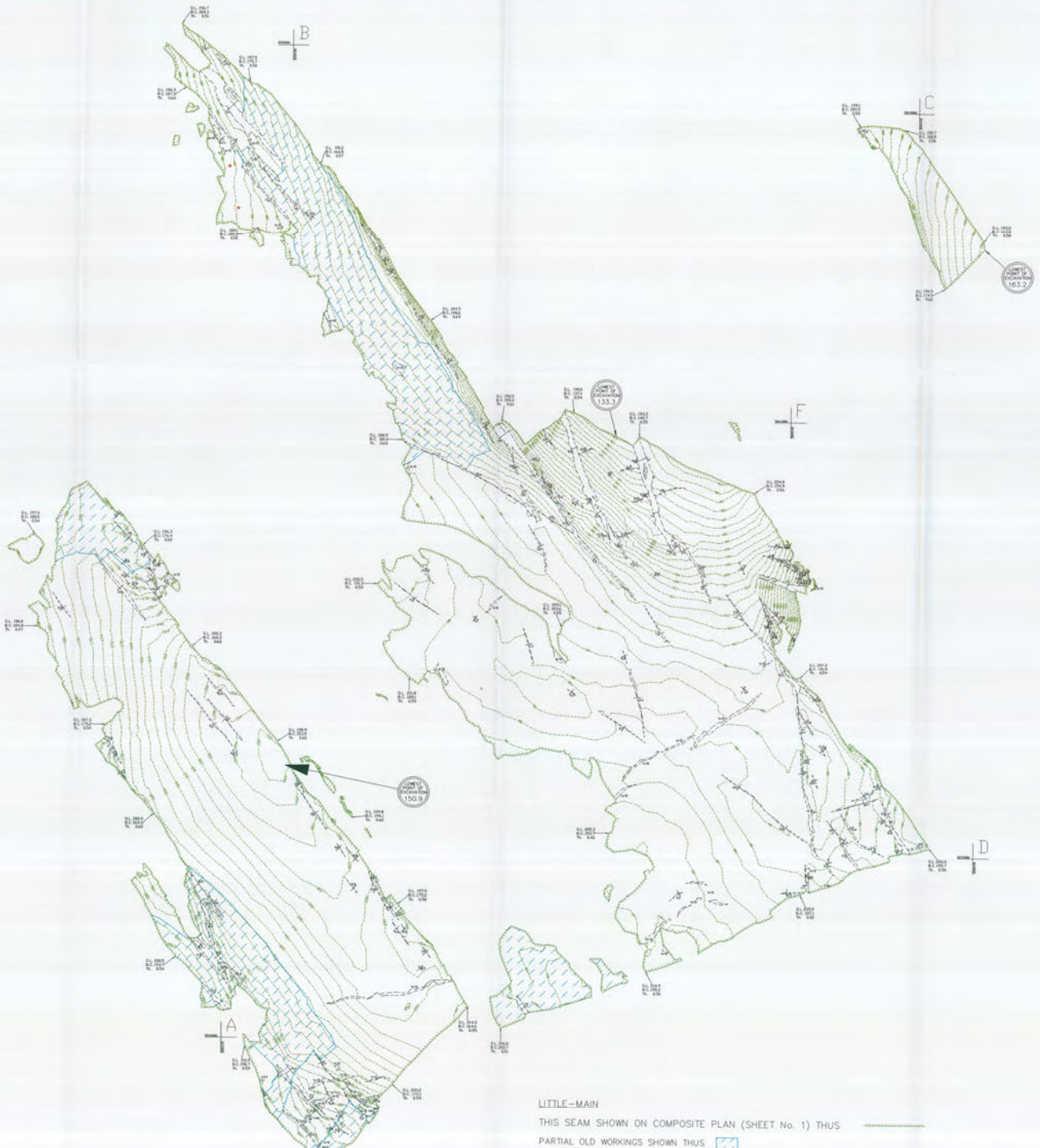
BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME
POTATOPOT

TITLE
COMPLETION PLAN

SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by: D.Messenger Date: 25-04-94	Checked by: S. Edwards Date: MAY 1994
Scale: 1:2500	Sheet 5 of 7
Drawing No. CP2720e	

16661



LITTLE-MAIN
THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS
PARTIAL OLD WORKINGS SHOWN THUS

16661

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME

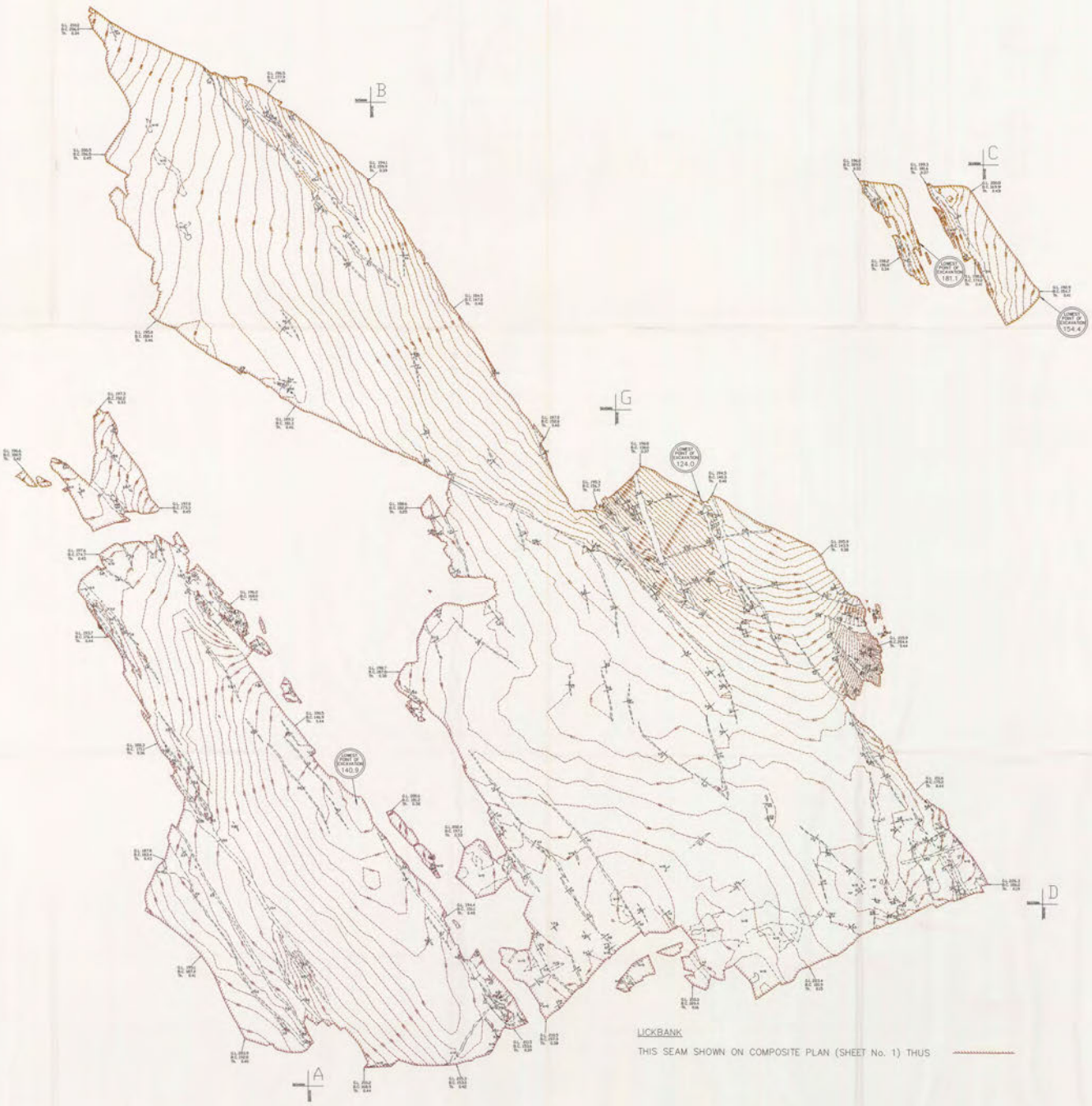
POTATOPOT

TITLE

COMPLETION PLAN

SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by Date: D.Messenger 06-05-94	Checked by Date: S. Edwards MAY 1994
Scale: 1:2500	Sheet 6 of 7
Drawing No. CP2720f	

16661



LICKBANK

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS

16661

BRITISH COAL OPENCAST
Headquarters, 200 Lichfield Lane,
Mansfield, Notts. NG18 4RG

SITE NAME

POTATOPOT

TITLE

COMPLETION PLAN

SITE REFERENCE NUMBER	OPERATIONAL CONTRACT NUMBER
032060	OE/CON/6090
Drawn by: D.Messenger Date: 14-04-94	Checked by: S. Edwards Date: MAY 1994
Scale: 1:2500	Sheet 7 of 7
Drawing No. CP2720g	

16661

SIXQUARTERS

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS

PARTIAL OLD WORKINGS SHOWN THUS

UPPER–THREEQUARTERS

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS

LOWER–THREEQUARTERS

THIS SEAM SHOWN ON COMPOSITE PLAN (SHEET No. 1) THUS

PARTIAL OLD WORKINGS SHOWN THUS

16661

Appendix B Mine Abandonment Plans

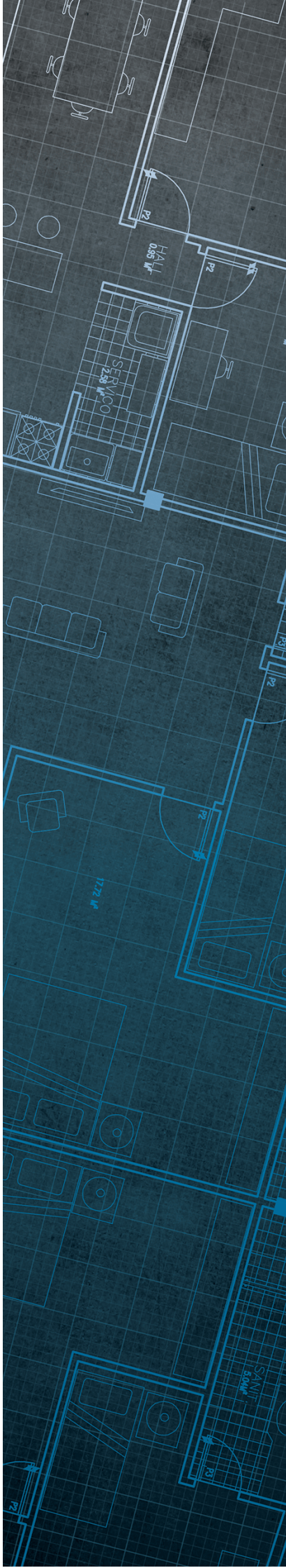
The Coal Authority

Consultants

Coal Mining Report

Gilgarran
Gilgarran
Cumbria
CA14 4RF

Date of enquiry:	**11 April 2023**
Date enquiry received:	**11 April 2023**
Issue date:	**11 April 2023**
Our reference:	**51003348836001**
Your reference:	**332511471**



Consultants

Coal Mining Report

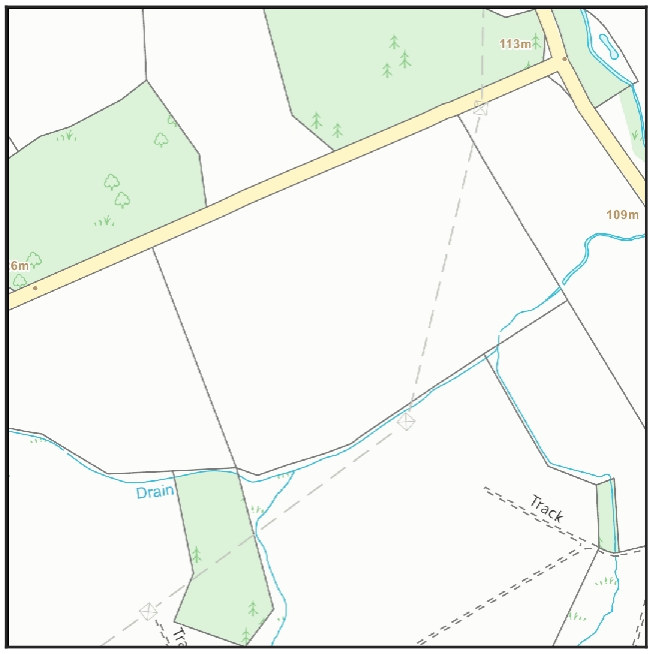
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Stantec

Enquiry address

Gilgarran
Gilgarran
Cumbria
CA14 4RF



Approximate position of property

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

w[redacted]

[redacted]rity

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	UNNAMED 6	Coal	0001	17	Beneath Property	4.8	North-East	56	1921
unnamed	UNNAMED 6	Coal	0058	17	Beneath Property	4.8	North-East	56	1921
unamed6	TWO FOOT	Coal	0002	22	Beneath Property	4.8	North-East	60	1922
unamed6	TWO FOOT	Coal	0003	29	Beneath Property	4.8	North-East	60	1922
unamed6	TWO FOOT	Coal	0059	34	Beneath Property	4.8	North-East	60	1922
unnamed7	UPPER TEN QUARTERS	Coal	A04F	37	Beneath Property			120	1900
unnamed	YARD	Coal	005E	63	Beneath Property	7.9	South-West	91	1908
UNAMED	YARD	Coal	005F	71	South	7.9	South-West	91	1908
unnamed	UNNAMED 8	Coal	0005	100	Beneath Property	4.8	North-East	117	1918

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

Distance to spine roadway (m)	Direction to spine roadway
Within	N/A

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	303522-001	303957 522609		Coal	
Shaft	303523-004	303937 523392		Coal	
Shaft	303523-005	303965 523372		Coal	
Shaft	303524-004	303488 524781	Shaft filled with colliery debris prior to 1957. This shaft is located in an area that has been worked by opencast mining operations. There are no details of any further treatment but it is likely that the shaft has been partially or totally removed.	Coal	
Shaft	304522-001	304466 522973		Coal	
Shaft	304522-002	304419 522974		Coal	
Shaft	304522-003	304438 522952		Coal	
Adit	304522-004	304725 522679		Coal	
Adit	304522-005	304777 522680		Coal	
Adit	304522-006	304714 522532		Coal	
Adit	304523-001	304414 523994	This adit is located in an area that has been worked by opencast mining operations. There are no details of any treatment but it is likely that the adit has been partially or totally removed.	Coal	
Shaft	304523-002	304247 523919	The shaft was filled to an unknown specification prior to 1957. This shaft is located in an area that has been worked by opencast mining operations. There are no details of any treatment but it is likely that the shaft has been partially or totally removed.	Coal	
Shaft	304523-003	304314 523896	The shaft was filled to an unknown specification prior to 1957. This shaft is located in an area that has been worked by opencast mining operations. There are no details of any treatment but it is likely that the shaft has been partially or totally removed.	Coal	
Shaft	304523-004	304476 523885	This shaft is located in an area that has been worked by opencast mining operations. There are no details of any treatment but it is likely that the shaft has been partially or totally removed.	Coal	
Shaft	304523-005	304466 523823	This shaft is located in an area that has been worked by opencast mining operations. There are no details of any treatment but it is likely that the shaft has been partially or totally removed.	Coal	

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	304523-006	304472 523112		Coal	
Shaft	304524-001	304400 524429	This shaft is in an area worked by opencast mining and may have been fully/partially removed by this method	Coal	
Shaft	305522-001	305152 522846		Coal	
Adit	305522-002	305197 522701		Coal	
Shaft	305522-003	305239 522686		Coal	
Shaft	305522-004	305267 522635		Coal	
Shaft	305522-005	305337 522543		Coal	
Adit	305522-006	305362 522540		Coal	
Adit	305522-007	305432 522562		Coal	
Adit	305522-008	305510 522516		Coal	
Shaft	305522-009	305295 522451		Coal	
Shaft	305522-010	305488 522424		Coal	
Shaft	305522-011	305536 522387	Shaft filled to an unknown specification prior to 1957.	Coal	
Shaft	305522-012	305712 522394		Coal	
Shaft	305522-013	305248 522359		Coal	
Shaft	305522-014	305206 522345		Coal	
Shaft	305522-015	305604 522298	Shaft filled to an unknown specification prior to 1957.	Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

16661	17391	NW1326
OM0	NC289	17367
0	10765	4070

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
UNNAMED 1	Coal	Yes	Within	N/A	161
UNNAMED 1	Coal	Yes	Within	N/A	169
UNNAMED 2	Coal	Yes	Within	N/A	99
UNNAMED 3	Coal	Yes	Within	N/A	84
UNNAMED 3	Coal	Yes	Within	N/A	90
UNNAMED 4	Coal	Yes	Within	N/A	154
UNNAMED25	Coal	Yes	Within	N/A	291
UPPER TEN QUARTERS	Coal	Yes	Within	N/A	79
UPPER TEN QUARTERS	Coal	Yes	Within	N/A	284
UPPER TEN QUARTERS	Coal	Yes	Within	N/A	327
YARD	Coal	Yes	Within	N/A	146

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Faults under or close to the property recorded.

Opencast mines

Please refer to the “Summary of findings” map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations
None recorded within 50 metres of the enquiry boundary.

Remediated sites
None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence
The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas
None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

Section 46 notices
No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

Withdrawal of support notices
The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

Payments to owners of former copyhold land
The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

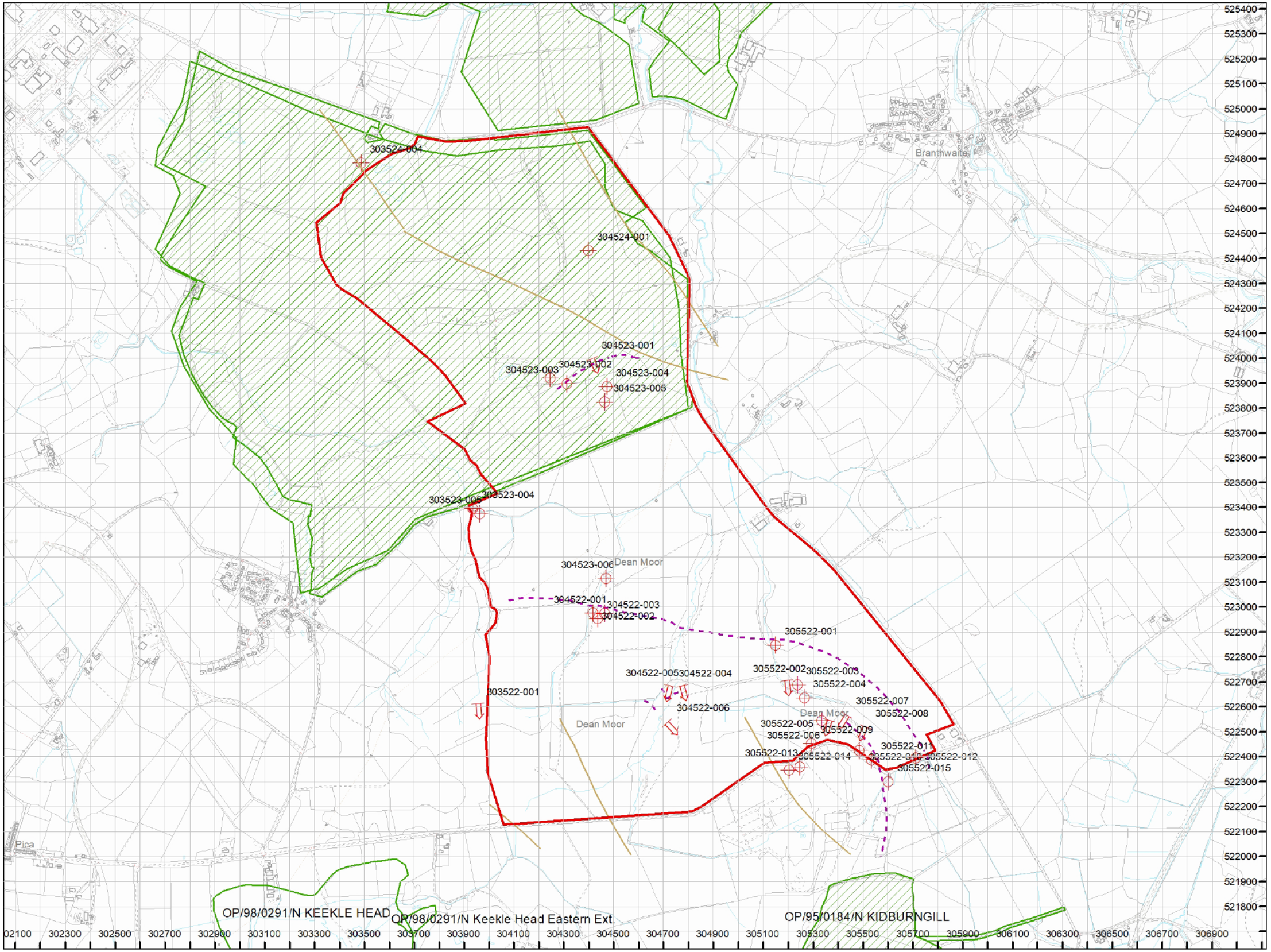
The Coal Authority

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Conjectured)
- Geological faults
- Opencast mine licence area
- Unlicensed opencast site



How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com