Dean Moor
Solar Farm

Environmental Statement: Chapter 10 – Ground Conditions

on behalf of **FVS Dean Moor Limited**

March 2025
Prepared by: Stantec UK Ltd
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DEAN MOOR SOLAR FARM
ENVIRONMENTAL STATEMENT
CHAPTER 10 – GROUND CONDITIONS
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)

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10 Environmental Statement (ES) Chapter 10: Ground Conditions

10.1 Introduction

10.1.1 This Chapter of the ES reports on the assessment of the likely significant effects of the Proposed Development on the environment with respect to ground conditions (stability and existing ground contamination) that has been undertaken and identifies the potential impacts and associated effects from the disturbance of land on the Proposed Development, human health, and the environment during the construction, operational, and decommissioning phases.

10.1.2 A full statement of author competency is provided in ES Appendix 1.1.

10.1.3 This Chapter should be read in conjunction with the following appendices, which have been used to inform the assessment:

- Appendix 2.3: Water Framework Directive Assessment **[REF: 6.3]**;
- Appendix 2.4: Flood Risk Assessment **[REF: 6.3]**;
- Appendix 2.8: Agricultural Land Classification ('ALC') Report **[REF: 6.3]**;
- Appendix 5.3: Outline Soils Management Plan ('OSMP') **[REF: 6.3]**;
- Appendix 10.1: Phase 1 Ground Condition Assessment ('GCA') **[REF: 6.3]**;
- Appendix 10.2: Coal Mine Hazard Assessment ('CMHA') **[REF: 6.3]**;
- Appendix 10.3: Peat Survey Report **[REF: 6.3]**;
- Appendix 10.4: Stakeholder Engagement **[REF: 6.3]**.

10.1.4 The following figures support this Chapter:

- Figure 1.1: Site Location Plan;
- Figure 10.1: Site Layout Plan and Site Reconnaissance Observations;
- Figure 10.2: Superficial Geology;
- Figure 10.3: Bedrock Geology; and
- Appendix 10.2 Figure 4.1, Showing Location of Former Opencast Coal Mine.

10.1.5 As of November 2024, the Coal Authority was renamed to the Mining Remediation Authority ('MRA'), as such any references within this report to the Coal Authority, should be taken to refer to the MRA.

10.2 Legislation and Planning Policy Context

Legislation

Environmental Protection Act (1990)

10.2.1 Legislation on contaminated land is principally contained in Part 2A of the Environmental Protection Act, 1990[1] (which was inserted into the 1990 Act by section 57 of the Environment Act 1995).

10.2.2 The Statutory Guidance[2] that accompanies the legislation provides a definition of what constitutes '*contaminated land*' and sets out the responsibilities of the Local Planning Authority ('LPA') and the Environment Agency ('EA') in the identification and management of contaminated land. The regulations also include a definition of 'risk', where a risk is said to be a combination of '*(a) the likelihood that harm, or pollution of water, will occur as a result of contaminants in, on or under the land; and (b) the scale and seriousness of such harm or pollution if it did occur*'.

Environmental Damage (Prevention and Remediation) Regulations (2015)

10.2.3 The Environmental Damage (Prevention and Remediation) Regulations 2015[3] aim to prevent new land contamination that will damage water or health. These regulations also include enforcement procedures, including criminal sanctions, for breaches of the regulations.

Environmental Permitting (England and Wales) Regulations (2016)

10.2.4 The Environmental Permitting (England and Wales) Regulations[4] cover the licensing of surface waters and groundwater abstractions and protect

[1] HM Government (1990). Environmental Protection Act 1990 c. 43

[2] HM Government (2012). Department for Environment, Food and Rural Affairs (DEFRA). Environmental Protection Act 1990: Part 2A – Contaminated Land Statutory Guidance.

[3] HM Government (2015). The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 No. 810

[4] HM Government (2016). The Environmental Permitting (England and Wales) Regulations, 2016 No. 1154

water resources through Source Protection Zones ('SPZs'). A groundwater abstraction may be present approximately 80m southwest of the Site.

Mining Waste Directive

10.2.5 Part of the land in the Areas A and D and all the land within Area B comprises a backfilled opencast coal mine, as discussed in Appendix 10.1 and shown on the Figure 4.1 in the CMHA (see Appendix 10.2).

10.2.6 European Parliament Directive 2006/21/EC (the Mining Waste Directive)[5] ('MWD') was adopted by the European Community in 2006. The Directive's overall objective is to provide for measures to prevent or reduce as far as possible any adverse effects on the environment as well as any resultant risk to human health from the management of waste from the extractive industries. It seeks to achieve this aim by providing for measures, procedures and guidance on how extractive waste should be managed.

10.2.7 To date the requirements of Directive 2008/98/EC (the Waste Framework Directive)[6] have applied in principle to all waste produced by the extractive industries. However, the effect of Article 2(1)(b)(ii) of the Waste Framework Directive is to exclude from its scope '*waste from prospecting, extraction, treatment and storage of mineral resources and the working of quarries*' where they are covered by other legislation.

10.2.8 The MWD is 'other legislation' for the purposes of Article 2(1)(b)(ii) of the MWD. Waste which falls within the scope of the MWD is not subject to the Landfill Directive (Article 2(4) of the MWD). This means that there is no overlap between the two directives; if the MWD applies, then the Landfill Directive does not.

[5] Official Journal of the European Union, 2006, Directive 2006/21.EC of the European Parliament and of the Council, on the management of waste from extractive industries and amending Directive 2004/35/EC. Document 32006L0021

[6] Official Journal of the European Union, 2008, Directive 2008/98/EC of the European Parliament of the Council, on waste and repealing certain Directives. Document 32008L0098

Water Resources Act (1991)

10.2.9 The Water Resources Act[7] aims to maintain and improve the quality of Controlled Waters (as defined in Part 3 of the Act). Part 2 of the Act covers the licencing of surface water and groundwater abstractions.

The Water Environment (Water Framework Directive) Regulations (2017)

10.2.10 The Water Framework Directive ('WFD') Regulations[8] establish a framework for the protection of surface waters and groundwater and to prevent the deterioration of WFD water bodies.

The Groundwater (England and Wales) Regulations (2009)

10.2.11 The Groundwater (England and Wales) Regulations[9] cover potential groundwater contamination that could eventuate from spillages or disturbance of contaminated ground. As identified in Appendix 10.1, sources of potential contamination have been identified within the Site, and the Proposed Development has the potential to create pollution risks during construction, operation, and decommissioning.

National Planning Policy

National Policy Statements

10.2.12 National Policy Statements ('NPS') set out the primary policy tests against which the application for a Development Consent Order ('DCO') for the Proposed Development would be considered. The text below provides details of the elements of the NPS for Energy ('EN-1')[10], NPS for Renewable Energy Infrastructure ('EN-3')[11] and NPS for electricity networks infrastructure ('EN-5')[12] that are relevant to this Chapter.

[7] HM Government (1991). The Water Resources Act, 1991 c. 57.

[8] HM Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 No. 407.

[9] HM Government (2009). The Groundwater Regulations 2009. ISBN 978-0-11-148081-6

[10] HM Government (2024). Department for Energy Security and Net Zero (DESNZ). Overarching National Policy Statement for Energy (EN-1).

[11] HM Government (2024). DESNZ. Overarching National Policy Statement for Renewable Energy Infrastructure (EN-3).

[12] HM Government (2024). DESNZ. Overarching National Policy Statement for Renewable Energy Infrastructure (EN-5).

Overarching NPS EN-1

- Paragraph 5.11.5 – *'Where pre-existing land contamination is being considered within a development the objective is to ensure that the site is suitable for its intended use. Risks would require consideration in accordance with the contaminated land statutory guidance as a minimum'.*
- Paragraph 5.11.14 – *'Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination. The sustainable reuse of soils needs to be carefully considered in line with good practice guidance where large quantities of soils are surplus to requirements or are affected by contamination'.*
- Paragraph 5.11.17 – *'Applicants should ensure that a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination'.*
- Paragraph 5.11.18 – *'For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination, and where contamination is present, applicants should consider opportunities for remediation where possible. It is important to do this as early as possible as part of engagement with the relevant bodies before the official pre-application stage'.*
- Paragraph 5.11.19 – '*Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place'.*
- Paragraph 5.11.28 – *'Where a proposed development has an impact upon a Mineral Safeguarding Area (MSA), the Secretary of State should ensure that appropriate mitigation measures have been put in place to safeguard mineral resources'.*

NPS EN-3

- Paragraph 3.10.19 – *'Applicants are encouraged to develop and implement a Soil Resources and Management Plan which could help to use and manage soils sustainably and minimise adverse impacts on soil health and potential land contamination'.*
- Paragraph 2.10.147 – *'Where developments are proposed on peat, to ensure the development will result in minimal disruption to the ecology, or release of CO2, and the carbon balance savings of the scheme are maximised, the Secretary of State should be satisfied that the solar farm layout and construction methods have been designed to minimise soil disturbance during construction and maintenance of roads, tracks and other infrastructure and in England should take into account the policies set out in the England Peat Action Plan 2021'.*

NPS EN-5

- Paragraph 2.2.10 – '*As well as having duties under Section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), applicants must take into account Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the*

desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and …do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects... In the rare case that the developer is not a licence-holder, the developer will nonetheless be influenced by the duties laid out in Section 9, even though they are not themselves under obligation'. Paragraph 2.9.25 – '*In such cases the Secretary of State should only grant development consent for underground or subsea sections of a proposed line over an overhead alternative if they are satisfied that the benefits accruing from the former proposal clearly outweigh any extra economic, social, or environmental impacts that it presents, the mitigation hierarchy has been followed, and that any technical obstacles associated with it are surmountable. In this context it should consider… the potentially very disruptive effects of undergrounding on … soil (including peat soils)* [and] *geology*'.

Environment Agency Groundwater Protection Position Statements (2018)

10.2.13 The EA regulates activities that may impact groundwater resources, to prevent and limit pollution. The EA Groundwater Protection Position Statements[13] require the promoters of schemes of national or regional significance to protect groundwater when choosing the location for their activity or development and to identify the potential pollution linkages and apply best available techniques to mitigate the risks.

10.2.14 Section A of 'The Environment Agency's approach to groundwater protection' (general principles) includes the following:

'A1: Wherever legislation allows, the Environment Agency will use a tiered, risk-based approach to regulate activities that may impact groundwater resources and to prevent and limit pollution.

A2: Development must be appropriate to the sensitivity of the site. Where the potential consequences of a development or activity are serious or irreversible the Environment Agency will adopt the precautionary principle to manage and protect groundwater. The Environment Agency will also apply this principle in the absence of adequate information with which to conduct an assessment.

A3: The Environment Agency encourages everyone whose activities may impact upon groundwater to consider the groundwater protection hierarchy in their strategic plans when proposing new development or activities. The aim is to avoid potentially polluting activities being located in the most sensitive locations for groundwater'.

[13] Environment Agency (2018). Groundwater Protection Position Statements. Available at: https://www.gov.uk/government/publications/groundwater-protection-position-statements Accessed October 2024

10.2.15 Section C of 'The Environment Agency's approach to groundwater protection' (Infrastructure) states the following:

'If national need for the provision and location of major developments overrides Environment Agency objections, the Environment Agency will raise its concerns and make every use of environmental impact assessment in addition to other measures to achieve environmental protection. Where developments receive approval against Environment Agency advice, it will apply section A - general protection position statements'.

England Peat Action Plan

10.2.16 The England Peat Action Plan[14] was published in 2021 by DEFRA. The plan aims to prevent further loss of peatland habitats and to restore more peatland landscapes to their natural state. The plan states:

'We want to ensure that the value of peatlands is taken into account when development is considered, including through biodiversity net gain. Some areas of peatland are potentially susceptible to development pressure and it is vital that planning policies reflect the importance of managing peatlands and avoid detrimental climate, water and biodiversity impacts from development'.

National Planning Practice Guidance

10.2.17 The National Planning Policy Framework ('NPPF') is supported by Planning Practice Guidance ('PPG'), as follows:

- Land Affected by Contamination[15], which describes how to manage land affected by contamination;
- Minerals[16] which details how mineral resources can be safeguarded against sterilisation by unsuitable development; and
- Land Stability[17], which explains how to ensure development is suitable for the ground conditions.

10.2.18 It is noted that the overarching national guidance against which the Proposed Development will be assessed is the NPS.

[14] HM Government (2021). DEFRA. England Peat Action Plan.

[15] HM Government (2014, last updated 2019). Ministry for Housing, Communities and Local Government (MHCLG). Planning Practice Guidance – Land Affected by Contamination.

[16] HM Government (2014). MHCLG. Planning Practice Guidance – Minerals.

[17] HM Government (2019). MHCLG. Planning Practice Guidance – Land Stability

Local Planning Policy

Allerdale Local Plan

10.2.19 Allerdale Borough Council ('ABC') formally adopted the Allerdale Local Plan (Part 1)[18] in July 2014 which was inherited by Cumberland Council (the 'Council') upon replacing ABC in April 2023.

10.2.20 Policy S2 (Sustainable Development Principles) provides multiple criteria against which development within the local plan area will be assessed. Amongst these are requirements to avoid pollution, promote waste reduction, promote renewable energy, avoid sterilisation of mineral resources, ensure efficient use of land and re-use of brownfield land, assess potentially unstable land due to historical mining and protect soils, water sources and water quality.

10.2.21 Policy S24 (Green Infrastructure) relates to the creation, enhancement, maintenance and protection of green infrastructure assets, and reference to '*promote improvements in air, water and soil quality'*.

10.2.22 Policy S30 (Re-Use of Land) relates to the use of previously developed land ('PDL') and contaminated or unstable land and requires that where there is a risk of potential site contamination or ground instability, an investigation into the quality of the land is undertaken. A Preliminary Risk Assessment ('PRA') of land contamination (as defined in the EA's Land Contamination Risk Management ('LCRM')[19] guidance) undertaken for the Site is provided within the Phase 1 GCA (Appendix 10.1) **[REF: 6.3]**.

10.2.23 Policy S35 (Protecting and Enhancing Biodiversity and Geodiversity) requires the protection of soil and water resources, as well as nationally, internationally, and locally designated protected sites and species. The PRA of land contamination provided within the Phase 1 GCA assesses the risks to the identified terrestrial ecology receptors (Dean Moor County

[18] Allerdale Borough Council (2014). Allerdale Local Plan (Part 1)

[19] HM Government (2023). Environment Agency. Guidance Land contamination risk management (LCRM)

Wildlife Site ('CWS')) and geodiversity receptors (Branthwaite Edge Local Geological Site ('LGS')).

10.2.24 Policy S36 (Air, Water and Soil Quality) states that developments will be resisted where they would have a demonstrable direct and/or indirect adverse impact on the physical or chemical condition of soil, and the chemical quality of water bodies and WFD assessed watercourses, unless adequate mitigation measures can be secured. An Agricultural Land Classification ('ALC') Report (Appendix 2.8) **[REF: 6.3]** and an Outline Soil Management Plan ('OSMP') (Appendix 5.3) **[REF: 6.3]**.

Cumbria Minerals and Waste Local Plan

10.2.25 Cumbria County Council's Cumbria Minerals and Waste Local Plan (MWLP) 2015 to 2030[20] was adopted in September 2017. This plan was inherited by the Council in April 2023.

10.2.26 Policies SP8 and DC15 of the MWLP identify mineral resources and existing, planned, and potential minerals infrastructure that is to be safeguarded from being unnecessarily sterilised by other developments, and the information it would like to see for developments within a safeguarded area. Further information in relation to minerals is provided in Appendix 10.1.

Local Guidance

10.2.27 In 2013, ABC and surrounding local authorities published a guidance document[21] to promote a consistent approach to the assessment of contaminated land across the county. Whilst it is principally aimed at making developers aware of the requirements of submitting a planning application, it provides guidance on the requirements for the various stages of investigation, assessment, remediation, and validation of potentially contaminated land.

[20] Cumbria County Council (2017) Cumbria Minerals and Waste Local Plan.

[21] Allerdale Borough Council (2013). Development of Potentially Contaminated Land and Sensitive End Uses – An Essential Guide for Developers.

10.3 Assessment Methodology

10.3.1 The elements excluded from this chapter and the reason for the exclusion are summarised below. Additional information is provided in the following:

- Mineral Resources – Justification for scoping this topic out is outlined in Table 10.1 of this Chapter and Chapter 2 - EIA Methodology, Table 2.7 [**REF: 6.1**];
- Biodiversity – consideration of this topic is provided in Chapter 8 [**REF: 6.1]**;
- Buildings (existing, including all heritage assets) – consideration of this topic is provided in Chapter 6 - Cultural Heritage **[REF: 6.1]**; and,
- The introduction of new contamination during the construction, operational and decommissioning stages does not form part of this Chapter as it is considered that there are suitable commitments within the Outline Construction Environmental Management Plan ('OCEMP') (Appendix 5.1) **[REF: 6.3]**, Outline Operational Management Plan ('OOMP') (Appendix 3.1) **[REF: 6.3]**, and the Framework Decommissioning Management Plan ('FDMP') (Appendix 5.4) **[REF: 6.3]**.

10.3.2 This chapter considers the impacts from potential sources of existing contamination on Controlled Waters as a receptor only. Further information relating to water resources is presented within the WFD Assessment (Appendix 2.3) **[REF: 6.3]** and the FRA (Appendix 2.4) **[REF: 6.3]**.

10.3.3 For assessing soils as a resource, other than for biomass production, reference has been made to guidance[22] published by the Institute of Environmental Management and Assessment ('IEMA').

10.3.4 Guidance on how to assess and manage the risks from land contamination is provided in Land Contamination Risk Management ('LCRM'). The underlying principle to ground conditions assessment is the identification of linkages formed of the following three elements:

- A source/hazard (a substance or situation that has the potential to cause harm or pollution);
- A pathway (a means by which that the hazard moves along / generates exposure); and

[22] IEMA 2022 A New Perspective on Land and Soil in Environmental Impact Assessment

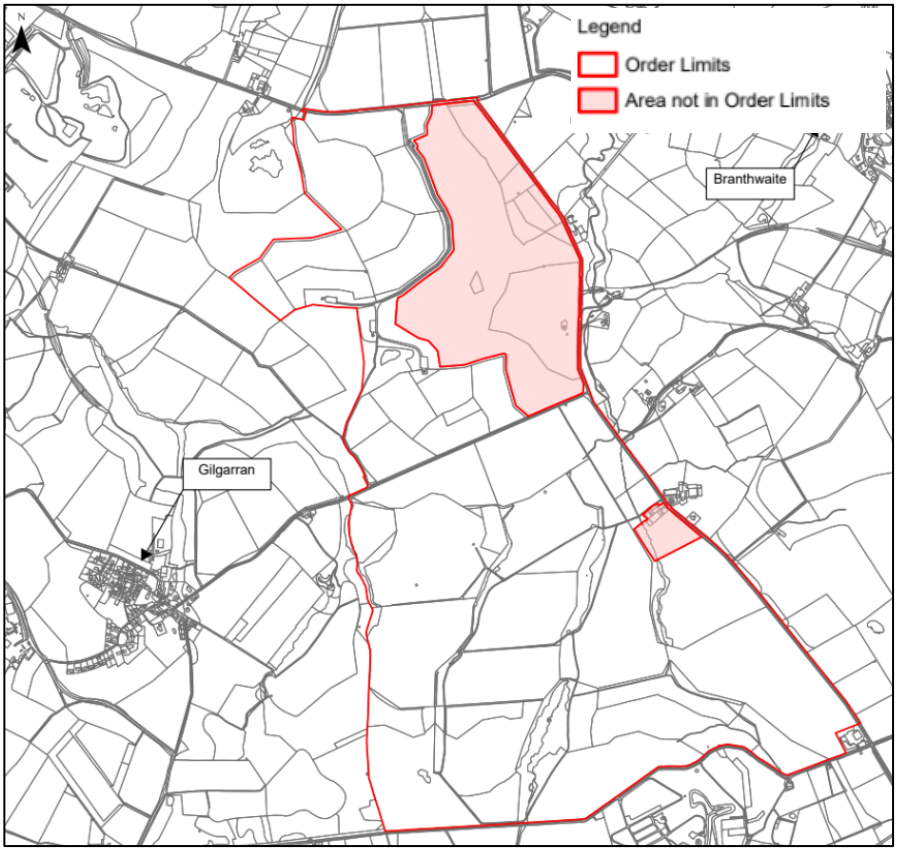
- A receptor/target (an entity that is vulnerable to the potential adverse effects of the hazard).

10.3.5 To assess the potential for ground conditions and land contamination to cause an effect, the extent and nature of the potential hazard is assessed, exposure or migration pathways are identified, and receptors or resources are identified and appraised to determine their value and sensitivity.

10.3.6 The assessment of potential ground instability issues has been undertaken based on walkover information and readily available published geological information together with data from open access sources.

Study Area

10.3.7 The Study Area is the land within the Site (Figure 1.1) (an inset of which is below) for the Proposed Development plus a surrounding distance depending on the likely zone of influence ('ZoI') for each feature/receptor.



10.3.8 The distances used in this assessment, as summarised in the bullet points below, are based on professional judgement, knowledge of similar projects

and the Design Manual for Roads and Bridges ('DMRB') LA 109[23] - Geology and Soils, and LA 113[24] – Road Drainage and the Water Environment. Although not directly relevant to the Proposed Development, the study areas described in the list below generally accord with the study area recommended in Guidance for the Safe Development of Housing on Land Affected by Contamination[25].

- Land-use activities with the potential to generate contamination are based on a review of mapping for the Site and up to 50m from the Site boundary. This is extended for activities such as landfills and large-scale industrial activities with the potential to generate significant contamination, up to 250m from the Site, to provide a wider setting description;
- Controlled Waters/Water Environment receptors are the groundwater and surface water immediately beneath and adjacent to the Site respectively, noting that characteristics used to define the sensitivity of surface water and groundwater are the river basin catchment and aquifer designation and abstraction records within a 1km radius;
- Human Health, Geomorphological Features and Building receptors are identified (from mapping) for the Site and immediately adjacent /up to 100m from the Site boundary to reflect the potential for atmospheric migration given the nature and scale of contamination; and
- Soil types have been identified within the Site for the Proposed Development.

Consultation

10.3.9 An EIA Scoping Report (Appendix 2.1) **[REF: 6.3]** for the Proposed Development was issued to the Planning Inspectorate on 7 August 2023 and an EIA Scoping Opinion (Appendix 2.2) **[REF: 6.3]** was received from the Secretary of State on 14 September 2023. Additional responses (separate to the Scoping Opinion) were received from the Council.

10.3.10 Table 10.1 sets out the comments raised in the Scoping Opinion relating to ground conditions and how these are addressed within this ES.

[23] Highways England (2019). Design Manual for Roads and Bridges (DMRB) LA 109 – Geology and Soils.

[24] Highways England (2020). DMRB LA 113 – Road Drainage and the Water Environment.

[25] NHBC (2008). Guidance for the Safe Development of Housing on Land Affected by Contamination R&D Publication 66.

Table 10.1: Planning Inspectorate's EIA Scoping Opinion Comments

Ref	Summary of Consultation Response	Response to Consultee
3.1.1	Agricultural Land and Soils '*The Inspectorate… agrees that an assessment of agricultural land can be scoped out of the ES*.' '*However, given the absence of specific ALC or soil data for the site… the Inspectorate does not agree to scope out impacts on soil resources from further assessment*'. '*The ES should consider the potential impact to soils from construction and decommissioning as well as setting out how any potential adverse impacts on soils can be avoided or minimised*'. '*The Inspectorate recommends that a Soil Management Plan is provided with the application and appropriately secured via the DCO*'.	An ALC Report (Appendix 2.8) and an OSMP has been prepared (Appendix 5.3). The ALC Report and OSMP are based on guidance within DEFRA, 2009[26] and MAFF, 2000[27]. The OSMP aims to maintain, and where possible improve the quality and quantity of soil resources (i.e., topsoil and subsoil) at the Site in its current physical condition (e.g., soil depth, soil texture, soil structure, soil drainage status), chemical condition (e.g., pH level, nutrient status and soil organic matter content) and to maintain soil health primarily during the construction of the Proposed Development. Post-consent, a Soil Management Plan ('SMP') will be produced for the construction phase which must be substantially in accordance with the OSMP. The SMP will sit alongside the CEMP which is secured by a DCO Requirement and substantially in accordance with the OCEMP. Before decommissioning, a SMP that specifies soil management during the decommissioning phase will be submitted to Council for approval. The SMP will form part of a Decommissioning Management Plan ('DMP') suite to be secured by a DCO Requirement and should include an appropriate aftercare plan as part of the Site's reinstatement scheme. A FDMP is provided at ES Appendix 5.4 **[REF: 6.3]**. The assessment of soils in this ES takes into consideration IEMA's 'A New Perspective on Land and Soil in Environmental Impact Assessment'[28] guidance (the 'IEMA Guidance').
3.1.11	Ground Conditions (Stability) *'Considering the site's coal mining legacy, potential historic unrecorded coal mining activity and any associated potential risks such as ground instability and emissions of mine gases, the Inspectorate considers that coal mining legacy issues should be considered within the ES or a standalone Coal Mining Risk Assessment*'.	A CMHA report is at Appendix 10.2. The detailed design will need to consider the findings of the CMHA and the Geophysical Survey Report[29].

[26] HM Government (2009). DEFRA. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

[27] HM Government (2009). The (former) Ministry of Agriculture, Fisheries and Food. Good Practice Guide for Handling Soils.

[28] IEMA 2022 A New Perspective on Land and Soil in Environmental Impact Assessment

[29] Headland Archaeology, 2023, Geophysical Survey Report, ref: DNMR23

Ref	Summary of Consultation Response	Response to Consultee
n/a	Coal Authority Response '*We wish to highlight that any form of development over or within the influencing distance of a mine entry can be dangerous and raises significant safety and engineering risks and exposes all parties to potential financial liabilities. The Coal Authority has adopted a policy where, as a general precautionary principle, the building over or within the influencing distance of a mine entry should wherever possible be avoided, even once treated*'. '*In light of the aforementioned policy, the Coal Authority would expect the detailed development layout proposal to be designed to avoid the mine entries and their associated potential zones of influence. Should insufficient documentary information be available, this may necessitate an initial phase of ground investigations to locate the mine entries prior to the formulation of the proposed layout plan*'.	A CMHA report has been prepared and is presented in Appendix 10.2. The detailed design will need to consider the findings of the CMHA and the Geophysical Survey Report[28].
3.1.11	Ground Conditions (Contamination) *'It is noted that the Applicant considers that* [risks arising from ground condition hazards] *can be adequately mitigated through adoption of standard measures. However, the Phase 1 Ground Conditions Assessment recommends that ground investigation is undertaken to confirm the anticipated low levels of potential contaminants and/or allow for further stages of assessment*'. '*The Inspectorate considers that there are a number of unresolved and uncertain matters identified in the scoping material and on this basis a ground conditions chapter prepared in accordance with relevant guidance should be included in the ES. The chapter should explain how relevant mitigation measures would be secured via the DCO*'.	Whilst the Planning Inspectorate's response does not explicitly identify a need for a contamination survey, and although there is no specific definition as to the level of information which should be included in the ES, Planning Inspectorate *Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping*[30] states that the level of information should be sufficient to inform a meaningful consultation and to elicit a level of feedback which will allow informed decisions to be made. A GCA has been prepared (Appendix 10.1) and used to inform this chapter. The Environment Agency responded at the EIA Scoping stage to confirm that they were satisfied with the approach (ES Appendix 2.2). A meeting was held with an Environmental Health Officer ('EHO') from the Council on 15 November 2023. The EHO agreed that the proposed approach to undertake intrusive surveys post consent to inform detailed design if needed was acceptable (see Appendix 2.9).

[30] HM Government (2020). Planning Inspectorate Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping.

Ref	Summary of Consultation Response	Response to Consultee
		This Chapter has been prepared in accordance with the relevant guidance.
n/a	Environment Agency Response, Section 4.7 – Ground Conditions *'Paragraph 7.63 states that a ground investigation will be undertaken to provide Site-specific information on ground conditions and facilitate the design of foundations and specification of control measures. We welcome this suggestion and note that the report makes reference to the relevant guidance for completing the site investigation.* *If contamination is identified, we may request that a foundation works risk assessment is completed for the proposed development.* *We are satisfied with the presented approach in relation to land contamination'.*	See response to reference 3.1.11 above.
n/a	Cumberland Council Response[31], Section 18.6 - Ground Conditions *'The construction of the Proposed Development will involve minimal ground disturbance, being limited typically to mini-piles for the solar PV arrays and trenching for the associated cables. The potential for these activities to impact the LGS located 170m east of the Site is highly limited, and impacts to geomorphological features, which are highly unlikely, would not be significant. It is accepted that this topic is scoped out of the ES*'.	Noted.
n/a	Environment Agency Response, Section 4.3 - Water Resources and Flood Risk '*We note that private water supplies have not been mentioned in the report. An enquiry should be made to the local authority to see if there are any small unlicensed private water supplies in the vicinity of the proposed development*'.	An enquiry relating to private water supplies was made to the Council as part of the GCA (Appendix 10.1). The Council's response is presented within Appendix E of Appendix 10.1 and states: '*There are no Private Water Supplies registered pursuant to the provisions of the Private Water Supply Regulations 2009, within 250m of the Site*'.
n/a	United Utilities Response *'UU requests that the assessment of potential environmental impact from ground conditions including any*	The environmental impacts from ground conditions including any contamination and hazardous materials are assessed within this Chapter.

[31] Cumberland Council, 2023, Letter to The Planning Inspectorate, dated 11th September 2023. Cumberland Council submitted a late response to consultation on the Scoping Report. Their comment does therefore not have a reference as it did not form part of the Scoping Opinion document.

Ref	Summary of Consultation Response	Response to Consultee
	contamination, hazardous materials or dewatering fully considers the impact on our assets, water resources, water catchment land and water quality as a result of construction of the proposed development'.	The impact on water resources, water catchment land and water quality because of the Proposed Development are addressed in WFD Assessment Appendix 2.3, FRA Appendix 2.4, and OCEMP Appendix 5.1.
3.1.18	<u>Minerals</u> *'The site is located within a Minerals Safeguarding Area (MSA) for brick clay and a Minerals Consultation Area'*. '*The ES should include an assessment of the potential impact of loss of access to mineral resources (including surface coal resource) during the lifetime of the Proposed Development where there is potential for likely significant effects to occur*'. '*The ES should demonstrate that the Minerals Planning Authority has been consulted in respect of the proposals and that the Proposed Development does not impact on future ambitions for minerals extraction within the region*'.	A meeting was held with a Planning Officer (Minerals and Waste Planning Policy) from Westmoreland and Furness Council (the 'MWPP Officer') on 16 November 2023 (acting on behalf of the Council). The officer advised that whilst the Site is in 'Surface Coal Resource – Mining Operations' this is not a safeguarding issue. See Appendix 2.9. The Site in a Minerals Consultation Area ('MCA') as it falls within the Minerals Safeguarding Area ('MSA') for Brick Clay. A small section of the Site (along the eastern boundary) also falls into the MSA for sand and gravel in addition to the Brick Clay. Policy DC15 of the Cumbria Minerals Waste Local Plan ('CMWLP')[32] therefore applies. For Sand and Gravel, the MWPP Officer at Westmoreland and Furness Council confirmed that prior extraction does not need to be considered in this case (see Appendix 2.9). Despite the current shortage of sand and gravel supply (less than the required landbank of at least 7 years), only a very small section on the edge of the Order Limits, under the existing highway, is encroaching into the edge of the MSA. Although most of the Site is within the MSA for Brick Clay, paragraph 5.66 of the CMWLP provides information on the significance of Brick Clay and Mudstones within Cumbria. This notes that brick clay is not commercially exploited in Cumbria currently except for a specialist brickworks near High Greenscoe quarry at Askham-in-Furness. There is also information there on the national policy for a 25-year landbank for brick clay and the fact the CMWLP has identified a Strategic area adjacent High Greenscoe quarry as an area to enable continued extraction of brick-making mudstones, as well as safeguarding brick clay generally. It is therefore considered that the area has sufficient capacity for Brick Clay and the Proposed Development's effect on prior

[32] Cumbria County Council (2017). Cumbria Minerals and Waste Local Plan 2015 to 2023.

Ref	Summary of Consultation Response	Response to Consultee
		extraction of the minerals resources does not need to be considered further within the ES. The officer suggested that a pragmatic approach would be for the PEIR to acknowledge the MSA and demonstrate adequate consideration and reference to the information in the Local Plan (see Appendix 2.9). Minerals is therefore scoped out of this ES.

10.3.11 A PEIR was published in March 2024, following which a statutory consultation period took place in April/May 2024. Table 10.2 sets out the comments raised in the PEIR relating to ground conditions and how these are addressed within this ES.

Table 10.2: Statutory Consultation Responses to the PEIR

Summary of Consultation Response	Response to Consultee
Coal Authority	
'*Our records indicate that within the area of the proposed solar farm there are recorded coal mining features present at surface and shallow depth including; 25 mine entries, shallow coal working, coal outcrops and areas of surface coal extraction. These features pose a potential risk to surface stability and public safety*'.	Details relating to coal mining, including mine entries are discussed within the CMHA provided as Appendix 10.2.
'*We note that a Desk-Based Coal Mining Hazard Assessment report, dated August 2023 and prepared by Stantec UK Limited supports the proposal. This report acknowledges the extensive coal mining legacy affecting the site. It advises that intrusive investigations will be required in order fully characterise this legacy, particularly where more sensitive elements of the development are proposed*'.	The ground investigations recommended in the CMHA will be undertaken post-consent and the information used to inform detailed design as outlined in the OCEMP.
'Where mine entries are present we would expect the layout of the solar panels to be designed to avoid directly locating panels, or structures, over these features or within their zones of influence. The location of the mine entries should be identified, either through intrusive works, or position review from source data, and the area of potential instability fenced to prevent unauthorised access into these areas in order to protect public safety'.	As per the above, the ground investigations recommended in the CMHA will be undertaken post-consent with the results of the investigations used to refine the design, as outlined in section 11 of the OCEMP. During the construction phase, no development or construction will be permitted within 50m of former Coal Mine Entries identified on Figure 3.1 of the CMHA, without further investigation/assessment as agreed with the Mining Remediation Authority.

Summary of Consultation Response	Response to Consultee
'The Coal Authority has adopted a policy where, as a general precautionary principle, the building over or within the influencing distance of a mine entry should wherever possible be avoided, even once treated. Our adopted policy on the matter can be found at: *www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries'*[33]	See above.
'It should be noted that wherever coal resources or coal mine features exist at shallow depth or at the surface, there is the potential for mine gases to exist. These risks should always be considered as part of the decision making process. The Planning & Development Team at the Coal Authority, in its role of statutory consultee in the planning process, only comments on gas issues if our data indicates that gas emissions have been recorded on the site. However, the absence of such a comment should not be interpreted to imply that there are no gas risks present. Whether or not specific emissions have been noted by the Coal Authority, the decision maker should seek its own technical advice on the gas hazards that may exist, and appropriate measures to be implemented, from technically competent personnel'	Mine gases emanating from historical workings beneath the Site are identified as a potential hazard in the Phase 1 GCA (Appendix 10.1) and are also discussed in the CMHA (Appendix 10.2). As per the above, the ground investigations recommended in the CMHA will be undertaken post-consent with the results of the investigations used to refine the design, (i.e., embedded mitigation by design), including a coal mining gas risk assessment following the guidance provided in CL:AIRE, 2021[34] as outlined in the OCEMP.
'*The Desk-Based Coal Mining Hazard Assessment report, and any additional information gathered in respect of the risks posed by coal mining features, should be provided with any future submissions to the decision-making body in respect of this project.'*	The CMHA is provided as Appendix 10.2.
Environment Agency	
Issue: A foundation works risk assessment (FWRA) has not been mentioned within the outline CEMP. *Impact: If the ground investigation identifies contamination at the site in the vicinity of where piled foundations will be used it is possible that they could create pathways for the vertical migration of contamination.* *Solution: Include a recommendation to complete a FWRA if contamination is identified.*	The Phase 1 GCA (Appendix 10.1) recommends that ground investigations are undertaken at the Site to confirm the ground conditions present in areas of potential geoenvironmental hazards. These investigations will be undertaken post-consent where necessary. If / where contamination is identified, a Foundation Works Risk Assessment ('FWRA') will be prepared and will be submitted for approval, as outlined in the OCEMP.

[33] HM Government (2012). Coal Authority. Guidance Building on or within the influencing distance of mine entries.

[34] CL:AIRE, 2021, Good Practice for Risk Assessment for Coal Mine Gas Emissions

10.3.12 Engagement with consultees in relation to ground conditions has been primarily through the Scoping Opinion and statutory consultation process, the data requests made to consultees to inform the baseline conditions, and further engagement are set out below.

10.3.13 At a meeting in October 2023, the Lead Local Flood Authority ('LLFA') expressed concerns relating to soil damage during construction and stated that *'The Soil Management Plan should detail measures to address soil compaction and/ or rivulets'* and *'Low ground pressure tyres would ideally be specified within the drainage strategy, and compliance required through a DCO Requirement to mitigate construction impact on soil'* (see Appendix C of ES Appendix 2.4).

10.3.14 At a meeting in November 2023 (Appendix 2.9) the approach to the assessment of ground conditions was agreed with the Council, whereby the PEIR (and subsequently the ES) would be informed by the Phase 1 GCA and CMHA and a targeted ground investigation and associated interpretative assessment would be undertaken post-consent to inform the detailed design of the Proposed Development.

10.3.15 A meeting was held with the Coal Authority in December 2024 (Appendix 10.4). At this meeting the following was discussed:

- The layout of the Proposed Development relative to mining or coal related features and the general approach to mitigating risk from coal mining hazards.
- The presence of potential and known historical mine entries and the location of these relative to the Proposed Development and the approach to ground investigation (including how this is to be secured) and construction in these areas. The investigation, remediation and any mitigation requirements associated with residual risks would be agreed with the Coal Authority through a separate permit. The Coal Authority agreed with the proposed approach, subject to review of the DCO and CEMP.
- The approach to management of residual risks and safety, whereby CEMP and OMP would identify areas where residual risks are present and what arrangements would need to be in place to ensure the safety of construction workers, or maintenance workers during operation, e.g., the areas where risks are present would be fenced off during

construction. During operation, in general fencing would only be provided in situations on the periphery of the Site, where public access is possible.

10.3.16 It is acknowledged that parts of the Site contain ground that can be soft and can become waterlogged. As discussed in Table 10.1 above, in response to comment reference 3.1.1, an OSMP (Appendix 5.3) has been prepared which sets out the methods to be followed to prevent soil damage and compaction during construction. Further mitigation (as described within the FRA) is outlined in the OCEMP (Appendix 5.1).

Assessment Criteria – Soils as a Resource

10.3.17 Table 10.3 presents the importance / sensitivity / value criteria for soils as a resource.

Table 10.3: Assessment Criteria – Soils as a Resource

Sensitivity of Topsoil and Subsoil	Soil Texture, Field Capacity Days ('FCD')[35] and Wetness Class[36]
High sensitivity (low resilience to structural damage)	Medium textures above where there are more than 225 FCD (Average Annual Rainfall ('AAR') greater than 1000mm). Heavy textures soils with more than 27% clay content: heavy silty clay loams ('HZCL'), heavy clay loam ('HCL'), sandy clay ('SC') silty clay ('ZC') clay ('C'); where FCD are 150 or more (AAR 700mm or greater). Organic and peaty soils.
Medium sensitivity (medium resilience to structural damage)	Above textures where there are 225 FCD or more (AAR 1000mm or greater). Medium textured soils with less than 27% clay content: silt loam ('ZL'), medium silty clay loam ('MZCL'), medium clay loam ('MCL'), sandy clay loam ('SCL'); where there are 225 FCD or fewer (AAR 1000mm or less). Heavy textures below (i.e., more than 27% clay content) where fewer than 150 FCD (AAR less than 700mm).
Low sensitivity (high resilience to structural damage)	Light textured soils: sand ('S'), loamy sands ('LS'), sandy loam ('SL'), sandy silt loams ('SZL'); where fewer than 225 FCD AAR less than 1000mm).

[35] Field Capacity Days is the number of days per year a soil is at Field Capacity. Field capacity is the amount of soil moisture or water content held in the soil after excess water has drained away (as per ES Appendix 5.3).

[36] Wetness class is a combination of topsoil texture and drainage status (as per ES Appendix 5.3).

Assessment Criteria – Ground Conditions

10.3.18 Tables 10.4 and 10.5 present the importance/sensitivity/value of the potential receptors and the magnitude of the impact criteria for this topic (land contamination).

Table 10.4: Criteria for Classifying Receptor Importance, Value or Sensitivity

Criteria	Definition
High	Receptor has little ability to absorb change without fundamentally altering its present character, typically is of national or international importance. Human health: Residential and uses where children are present. Surface Water: Watercourse having a WFD shown in a River Basin Management Plan ('RBMP') of Good[37]. Water feeding a site protected/designated under EC or UK legislation (Special Area of Conservation, Special Protection Area, and Site of Special Scientific Interest, Ramsar convention designated wetland of international importance). Groundwater: Principal aquifer. SPZ 1 or 2. Built environment: Universities, national infrastructure such as motorways.
Medium	Receptor has moderate capacity to absorb change without significantly altering its present character, is typically of county or regional importance. Human health: Employment, or short term / transitory use only. Surface water: Watercourse having a WFD classification shown in the RBMP of Moderate or Poor. Groundwater: Secondary A Aquifer. SPZ3 (Outer Protection Zone) associated with licensed abstractions. Built environment: Secondary schools, large housing estates, A roads/dual carriageways.
Low	Receptor is tolerant of change without detriment to its character, is typically of low or local importance. Human health: Transient or Limited Access. Surface water: Watercourses having a WFD classification shown in a RBMP of Bad. Groundwater: Secondary B Aquifer. Small scale private water abstractions (i.e., feeding fewer than ten properties). Built environment: Primary schools, small number of dwellings, B roads.
Very Low	The receptor/resource is tolerant of change without detriment to its character or does not make a significant contribution to local character or distinctiveness and is not designated. Human health: No access. Surface water: Watercourses not having a WFD classification.

[37] The WFD classifications used in this table relate principally to the Ecological Classification on the basis that chemical assessment of water bodies was not undertaken in Cycle 3 2022. The Cycle 3 2019 (and earlier) data only provides chemical quality classifications of 'Fail' or 'Good' and therefore does not allow for a range of sensitivity classifications to be defined.

Criteria	Definition
	Groundwater: Unproductive Aquifer. Built environment: isolated residential dwellings, unclassified roads.

10.3.19 For land contamination the magnitude of impact is identified as the potential magnitude of existing contamination based on the nature of the land-use activity and its potential to generate contamination. An impact that releases or exposes contamination results in an adverse effect and one that reduces the quantum of contamination (through remediation or design such as a basement requiring removal of contaminated soil) results in a beneficial effect.

Table 10.5: Magnitude of Impact

Magnitude of Impact	Description
Major	Land-use identified as having a hazard score (potential to generate contamination) of High. Examples include gas works, landfills, chemical manufacture.
Moderate	Land-use identified as having a hazard score (potential to generate contamination) of Medium. Examples include large scale industrial uses and open cast mines.
Minor	Land-use identified as having a hazard score (potential to generate contamination) of Low. Examples include small scale and/or recent industrial uses and schools.
Negligible	Land-use identified as having a hazard score (potential to generate contamination) of Very Low. Examples include farming and housing.

10.3.20 Remedial or mitigation solutions that do not reduce the quantum of contamination present (relative to the baseline condition) mean that the assessed magnitude of the impact does not change. This does not mean that these solutions are ineffective however, as they will reduce the likelihood of an impact being realised.

10.3.21 For example, where potentially contaminated soils are present in the baseline condition and the proposed end use of the area is for soft-landscaping, the introduction of a clean-cover system to break the pathway between the source and the receptor does not change the quantum of contamination present (i.e., the hazard and the magnitude of impact have not changed). If, however, the introduction of the clean-cover

system, means that the end-user is now unlikely to come into contact with the contamination, then the likelihood of the impact being realised has been reduced.

10.3.22 Table 10.6 below presents a description of the likelihood terms used in this assessment.

Table 10.6: Descriptions of Likelihood[38]

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

10.3.23 Table 10.7 presents a description for potential effects in respect of ground conditions.

Table 10.7: Descriptions of Effect for Land Conditions

Effect	Description
Major	Human health effect – Acute damage to human health e.g., through asphyxiation because of ground gas ingress. Exposure resulting in 'significant harm' as defined in Part 2A Statutory Guidance[39]. Controlled Water effect - Equivalent to Environment Agency ('EA') Category 1 pollution incident including persistent and / or extensive effects on water quality. Built environment: Structure grossly distorted, collapse. Soil (resource) - Irreversible loss / potential for permanent improvement of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha[40].

[38] Definitions of likelihood as given in Table 6.4 of CIRIA Publication 552 (C552) "Contaminated Land Risk Assessment – A Guide to Good Practice".

[39] HM Government (2012). DEFRA. Contaminated Land Statutory Guidance.

[40] IEMA (2022). A New Perspective on Land Soil in Environmental Impact Assessment

Effect	Description
Moderate	Human health effect – Chronic exposure resulting in 'significant harm' as defined in Part 2A Statutory Guidance. Controlled Water effect - Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value. Pollution of a groundwater abstraction that impairs its function. Built environment: Walls out of perpendicular by several degrees, floors inclined/heaved. Soil (resource) - Permanent, irreversible loss / potential for improvement of one or more soil functions or soil volumes, over an area of between 5 and 20ha
Minor	Human health effect – Minimal short-term effects on human health. Protective equipment is required during site works. Controlled Water effect – Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality. Built environment: Minor foundation settlement. Soil (resource) – Permanent, irreversible loss / potential for improvement over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes.
Negligible	Human health effect – No measurable effect on humans. Protective equipment is not required during site works. Controlled Water effect – No appreciable pollution. Short term observed effects. Built environment: Hairline cracks <0.1mm Soil (resource) – No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

10.3.24 Table 10.8 assigns the significance of an environmental effect, determined by the interaction of magnitude and sensitivity, whereby the effects can be negligible, beneficial, or adverse.

Table 10.8: Descriptions of Significance of Environmental Effect

Magnitude	Sensitivity			
	High	Medium	Low	Very Low
Major	Major Adverse / Beneficial	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial
Moderate	Major Adverse / Beneficial	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible
Minor	Moderate Adverse / Beneficial	Minor Adverse / Beneficial	Negligible	Negligible
Negligible	Minor Adverse / Beneficial	Negligible	Negligible	Negligible

10.3.25 Moderate and Major (adverse/beneficial) effects are considered Significant.

Limitations and Assumptions

10.3.26 Historical maps and aerial photographs provide a 'snapshot' in time of 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. It is possible for developments to have occurred between surveys that are not shown or for the map record to have been censored for military security.

10.3.27 The absence of cavity records in the natural and mining cavities (non-coal) databases[41] is not considered conclusive as to the absence of these features.

10.3.28 Legislation changes (i.e., a change in what is an acceptable contamination concentration in the environment) could mean that areas previously not designated as Contaminated Land (as defined by Part 2a of the Environmental Protection Act 1990) then become designated as Contaminated Land.

10.3.29 The sensitivity designations of receptors identified within this assessment may change. For example, if a new groundwater abstraction/potable supply well is installed close-by to the Site, the sensitivity designation of the groundwater receptor may change by virtue of the Site's location within/proximity to a new groundwater SPZ, or the human health (off-Site) receptor sensitivity could change if new residential developments were constructed adjacent to the Site boundary.

10.3.30 None of the temporary (construction and decommissioning phase) and permanent (operational phase) structures, other than potentially the Distribution Network Operator ('DNO') infrastructure are likely to have in-ground or ground bearing foundations, and this mitigates the risk associated with the potential presence of coal mine and ground gases. Consideration of the potential for gas ingress to the Grid Connection

[41] Stantec, 2024, Natural and Mining Cavities (Non-Coal) Database

Infrastructure (Work No. 2) is assumed to be undertaken during detailed design if warranted.

10.3.31 The method of constructing the solar array frameworks is anticipated to comprise the installation of foundations that are likely to comprise the following types:

- Driven piles - metal posts with a typical footprint of approximately 0.0012 - 0.0014 m^2, driven to a typical depth of around 2m below ground level ('bgl') and a maximum depth of up to 4m bgl using a low-earth pressure tracked piling machine; or
- Use of ballast to weigh down the frameworks. This option is non-intrusive and uses concrete blocks or another form of ballast to anchor the frameworks.

10.3.32 Other mounting types that are less likely to be utilised, or that could be utilised in limited areas depending upon the ground conditions (e.g. areas where shallow embedment is necessary) comprise:

- Anchored piles – a mounting system utilising four 'rods', driven to shallow depth (typically less than 2m bgl) at approximately 45 degrees into the ground using hand tools, at the base of each post of the PV array framework.
- Screw piles – Ground anchors that are 'screwed' into the ground using an attachment for an excavator.

10.3.33 Based on the above the effect arising from the potential creation of preferential pathways to Controlled Waters from the introduction of solar arrays is assumed to be negligible.

10.3.34 The effect associated with the permanent loss of soils due to compaction associated with the frameworks for the solar arrays is assumed to be negligible with the array posts comprising an estimated 0.005% of the total Site area (Flood Risk Assessment (ES Appendix 2.4) [**REF: 6.3**] provides the background and supporting calculation).

10.3.35 Based on the above estimation of the proportion of the ground that will have piles, the effect on peat arising from reduced infiltration and lateral groundwater flow is assumed to be negligible.

10.3.36 Excess arisings are not anticipated to be generated during the construction of the solar arrays, the temporary compounds (construction and decommissioning phase) and the permanent (operational phase) structures except potentially with respect to the grid connection infrastructure. For the temporary compounds, the soils will be stripped and stored in accordance with the SMP and then returned to the original location. It is recognised that the trenching for any cables will generate arisings which will subsequently be used to backfill.

10.4 Baseline Conditions

10.4.1 The baseline conditions described below utilises the information presented in the ALC Report (Appendix 2.8), Phase 1 GCA (Appendix 10.1), CMHA (Appendix 10.2), and Peat Survey Report (Appendix 10.3).

10.4.2 The GCA has been prepared following the guidance given in LCRM and presents the following:

- A preliminary investigation comprising a desk-based study of published and readily available public information including historical OS maps and aerial photographs and a Site reconnaissance walkover;
- A preliminary ground stability appraisal and initial identification of potential ground condition constraints to development (including a summary of those hazards identified in the CMHA); and
- A Preliminary Risk Assessment (Tier 1 PRA) which is a qualitative assessment of data to develop a conceptual model ('CM') including the identification of potentially contaminative current and historical activities on-Site and off-Site and source pathway-receptor pollutant linkages.

10.4.3 The CMHA presents a desk-based review of information relating to mining relevant to the Site and has been prepared following the guidance presented within CIRIA C758D - Abandoned Mine Workings Manual,[42], and CL:AIRE, Good Practice for Risk Assessment for Coal Mine Gas Emissions[43].

10.4.4 The aims and policy goals presented in the England Peat Action Plan have been considered, especially, how protection is afforded to peatlands

[42] CIRIA, 2019, Abandoned Mine Workings Manual, C758D

[43] CL:AIRE, 2021, Good Practice for Risk Assessment for Coal Mine Gas Emissions

in national planning policy. In consideration of this aim/policy a Peat Survey has been undertaken (see Appendix 10.3) of the mapped areas of peat within the Site. The Peat Survey Report provides a summary of the peat survey methodology, a summary of the survey results and recommendations and was carried out in line with Guidance on Developments on Peatland[44].

10.4.5 The Phase 1 GCA and CMHA reports were prepared in 2023, with the Peat Survey Report prepared in 2024.

Baseline Soil (Resource) Conditions

10.4.6 The ALC Report (Appendix 2.8) presents an assessment of agricultural land quality in accordance with the guidance provided in MAFF, 1988[45] and draws upon an earlier assessment of approximately three quarters of the Site which was carried out by MAFF in 1990. It reviews information related to the Site's climatic, gradient, and micro-relief, flood risk, geological and soil ALC setting and then presents the ALC gradings for the Site.

10.4.7 The ALC Report identifies that 'The National Soil Map shows that soils in the Brickfield 3 Association predominantly cover agricultural land at the Site. A pocket of soil in the Rivington 2 Association has developed from the sandstone in the southwest corner of the Site within Area C. There is a narrow band of soil in the Wilcock 1 Association along the southern boundary of Area C, to the south of Thief Gill, on land underlain by peat'. The Brickfield 3 Association and Wilcox 1 Association soils are predominantly loamy or peaty, and clayey and are poorly drained. The soils of the Rivington 1 Association are described as 'coarse, loamy, well drained'.

10.4.8 The ALC Report further identifies that none of the land within the Site falls within ALC '*Grades 1 to 3A*', i.e., the Site does not contain land of '*Best*

[44] Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.

[45] Ministry of Agriculture, Fisheries and Food, 1988, Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (ALC011).

and Most Versatile' ('BMV') quality. Approximately 64% of the Site is identified to be of '*Grade 4 (Poor)*' quality, approximately 13% of the Site is identified to be of '*Grade 5 (Very Poor)*' quality, and approximately 6% of the Site is classified as '*other land / non-agriculture*'. The remaining approximately 17% is classified as '*Grade 3b (Moderate)*'.

10.4.9 The ALC Report also identifies that the FCDs for the soils at the Site are between 287 and 303.

10.4.10 Based on the above, and in accordance with Table 10.3, the soils within the Site are assessed to be of High Sensitivity (low resilience to structural damage).

Peat Survey

10.4.11 A Peat Survey Report has been prepared to determine the presence / absence / extent of peat within portions of Area C (Areas A and B having been excluded based on its historical use as an opencast mine).

10.4.12 Two phases of survey were undertaken. The initial survey was carried out during November 2023 and comprised probing on a 100m grid across the land to the south of Gilgarran Road. Additional probing was undertaken on a 25m grid across the area proposed for the grid connection infrastructure to confirm that this area of potential increased below ground impacts from structures with piled foundations is outside of the area in which peat is present.

10.4.13 The second phase of survey, carried out following assessment of the initial survey results, was undertaken in February 2024 and comprised a 10m grid of probing aimed to delineate the peat spatial extent and depth across the area where peat was identified by the initial phase of survey, and where indicated by British Geological Society ('BGS') information.

10.4.14 Over 92% of the survey area was found to be underlain by soft soil with a depth less than 1m. Deeper areas of soft soil were found in localised pockets within the areas identified as peat in the BGS mapping, generally associated with topographical lows in proximity to watercourses. Soft soil

was indicated in these areas from 1m bgl up to a maximum depth of 2.4m bgl at only 59 of the 808 probe locations.

10.4.15 Follow-up trial pitting in the identified areas of soft soil recorded brown to dark brown fibrous peat in only two locations. A von Post classification of the two localised areas of peat encountered showed it to be H9 indicating that the peat is practically fully decomposed.

Potential Ground Condition Hazards

Land Contamination/Radon/Unexploded Ordnance (UXO) Hazards

10.4.16 The land in the north of the Site (Areas A, B, and D) was historically part of an opencast coal mine that was operational between the late 1980s and early 1990s. Opencast mining ended in 1993, followed by backfilling and restoration. Searches undertaken have not revealed any information about the materials used as backfill.

10.4.17 The only information provided by the Coal Authority was that the backfill was '*uncompacted*'. On the basis that the backfilling took place relatively recently, the backfilling is assumed to have been undertaken in a controlled and regulated manner, and therefore it is considered likely that the pit has been backfilled with overburden and mine arisings. The mine arisings could contain elevated concentrations of metals. Ground investigation for geotechnical design would incorporate contamination sampling/testing as appropriate.

10.4.18 Most of the land in Area C, at the south extent of the Site, has historically been used for agriculture, with the exception of limited areas of quarrying and mining (see Appendix 10.2, Figure 3.1). The quarries recorded on the historical maps remain visible on contemporary aerial imagery and therefore do not appear to have been backfilled and are not considered to present an environmental hazard to the Site. Residual concentrations of agrichemical residues could be present in the soil.

10.4.19 Where access tracks have been formed using imported materials of unknown origin, these are identified as potentially containing

contaminants, including asbestos-containing materials, noting the presence of such tracks is limited in extent in the context of the Site.

10.4.20 Off-Site activities with the potential to generate contamination are the garage/car dealer immediately to the south-east and Rigg House Farm to the east, where bulk storage of fuels and chemicals may have taken place. There is a potential for mine gas emissions, although this hazard would only apply to entry into confined spaces during construction and the operational phase where structures with enclosed spaces are present.

10.4.21 Approximately 50% of the Site is mapped as located within an area where less than 1% of properties are estimated to be at or above the UK Health Security Agency Radon Action Level. However, parts of the Site are located in areas of higher radon risk, with the maximum band identified being between 10% and 30%. For commercial properties, the Ionising Radiations Regulations[46] require action to protect employees if the average radon gas concentration exceeds 300 Bq/m^3. If the level of radon in a building is close to or above these levels, action should be taken to reduce the levels of radon. The structures associated with Proposed Development will not be occupied. Therefore, levels of radon are not relevant to the Proposed Development.

10.4.22 As described in the Phase 1 GCA (Appendix 10.1), the risk associated with UXO is identified as being low based on a review of the risk map for unexploded bombs and a Pre-Desk Study Assessment, which identified a 'Low' risk and concluded that a more detailed desk study to define protection measures is not considered necessary.

Instability Hazards

10.4.23 Instability hazards considered at the Site have been divided into naturally occurring geological hazards (including collapsible ground, compressible ground, dissolution features, landslides, running sands, shrinking/swelling clay), and hazards arisings from historical land use.

[46] HM Government (2017). The Ionising Radiations Regulations 2017 No. 1075.

10.4.24 The following naturally occurring geological hazards have been identified:

- Low potential for running sands;
- Moderate potential for compressible ground where peat and alluvium are present (localised and relatively small scale); and
- High potential for landslides/slope instability, as there are several steep sloping areas of the Site, particularly in the south of Area C.

10.4.25 The following hazards arising from historical land use have been identified:

- Known and potential mine entries (shafts and adits);
- Potential shallow and / or surface mine workings;
- Opencast coal mine and mapped artificial ground;
- Coal mine gases; and
- Potential differential settlement associated with the opencast mine high wall.

Receptor Identification

10.4.26 This section identifies the receptors considered within this assessment. It is noted that some receptors identified for assessment are not present in the baseline conditions, e.g., buildings / structures associated with the Proposed Development or Human Health (construction workers).

Groundwater (Geology and Aquifer Designations)

10.4.27 The 1:50,000 scale geological sheet indicates that the bedrock geology is dominated by Carboniferous strata (the Whitehaven Sandstone Formation and Coal Measures Group (Middle and Lower)). The Carboniferous deposits unconformably overlie the Lower Palaeozoic Caledonian basement at depth.

10.4.28 Carboniferous strata are overlain by a variable but generally minor thickness of superficial deposits comprising Glacial Till, Alluvium, Peat, Landslide Deposits and Alluvial Fan Deposits.

10.4.29 Artificial Ground (consisting of Infill Deposits and Made Ground) is mapped as present across Areas A, B, and D of the Site.

10.4.30 The EA aquifer classifications are as follows:

- Alluvium and Alluvial Fan Deposits - Secondary A Aquifers;

- Glacial Till - Secondary Undifferentiated Aquifer;
- Peat – Unproductive; and
- Bedrock Geology (all of the bedrock strata) - Secondary A aquifers.

10.4.31 Groundwater is identified as a potential receptor (to contamination) and allocated a sensitivity/value/importance of low for the superficial deposits and medium for the deeper bedrock aquifers.

Surface Water (Hydrology)

10.4.32 The FRA (ES Appendix 2.4) address the potential impacts to physical attributes (water quantity and flow) and pollution creation.

10.4.33 There are multiple small 'ordinary watercourses' across the Site that serve a land drainage function for the agricultural land, of which the principal watercourse is Thief Gill (a tributary of the Lostrigg Beck – a statutory Main River outside of the Site). These watercourses generally flow in a north-east/eastern direction within the southern half of the Site. Ordnance Survey ('OS') mapping also records a further ordinary watercourse approximately 100m to the south of the Site.

10.4.34 The EA's Catchment Data Explorer indicates that most of the Site is located within the Lostrigg Beck[47] catchment, with limited areas located in the Lowca Beck[48], Marron[49] and Keekle (upper)[50] catchments.

10.4.35 The Lostrigg Beck, Lowca Beck and Marron Catchments received a WFD Ecological Classification of Moderate in 2019. The Keekle (upper) catchment received a WFD Ecological classification of Good in 2019.

10.4.36 Surface water is identified as a potential receptor (to existing contamination) and allocated a sensitivity/value/importance of medium.

[47] Environment Agency, 2023, Catchment Data Explorer – Lostrigg Beck. Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB112075070550 Accessed October 2024

[48] Environment Agency, 2023, Catchment Data Explorer – Lowca Beck. Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB112074070040 Accessed October 2024

[49] Environment Agency, 2023, Catchment Data Explorer – Marron. Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB112074070040 Accessed October 2024

[50] Environment Agency, 2023, Catchment Data Explorer – Lowca Beck and Keekle (upper). Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB112074070030 Accessed October 2024

Archaeological Setting and Buildings

10.4.37 Whilst the GCA (Appendix 10.1) includes consideration of archaeology as a receptor for the purposes of risk assessment; to prevent duplication within the ES, the reader is directed to Chapter 6 – Cultural Heritage [**REF: 6.1**] for the assessment of effects on statutorily designated archaeological and heritage receptors.

10.4.38 In the context of ground conditions, the identified instability hazards identified could cause differential settlement and there is the potential for coal mine gases to be present.

10.4.39 During the construction and decommissioning phases, the buildings receptor comprises temporary structures placed on the Site, e.g., cabins, offices, drying rooms, welfare facilities etc, alongside any elements of the Proposed Development that have so far been constructed but are not yet operational or remain on-Site following switch-off. Based on their temporary / non-operational nature, these have been assigned a sensitivity/value of very low.

10.4.40 During the operational phase, the buildings receptor comprises the proposed structures (solar PV arrays, Grid Connection Infrastructure and Associated Infrastructure) and on the basis of its regional value has been assigned a sensitivity/value of medium.

Human Health

10.4.41 In the context of the Proposed Development, human health receptors will be workers during construction and decommissioning phases, and workers who will require transient access for maintenance activities during the operational phase. This receptor has been assigned a sensitivity/value of medium.

Soil Resource

10.4.42 As described in Appendix 10.3, most of the soils at the Site are of the Brickfield 3 Association type. Limited areas are underlain by soils of the Rivington 2 and Wilcox 1 Associations, however as the dominant soil type

is the Brickfield 3 Association, the baseline conditions for soil resource will be based on this soil type.

10.4.43 The Brickfield 3 Association soils at the Site have a FCD of between 287 and 303 and are of wetness class IV to VI. On this basis, this receptor has been assigned a sensitivity/value of High.

10.4.44 The predominant soil types present at the Site are described (Appendix 10.3) as '*loamy, peaty, and clayey and are poorly drained'* and there are also smaller, isolated pockets of peat indicated. The sensitivity/value of High assigned to the Brickfield 3 Association soils is considered suitable for the assessment of peat.

Geomorphological Features / Natural Assets

10.4.45 There are no geomorphological features / natural assets located within the Study Area.

Future Baseline

10.4.46 The foreseeable future baseline conditions existing at the Site in 2026 (which is the earliest potential construction start for the Proposed Development), without the implementation of the Proposed Development (or any other development on or in the vicinity of the Site) are unlikely to differ from the conditions identified in 2023.

10.5 Likely Significant Effects

10.5.1 The ground conditions in Areas A, B, and D are identified as having a Medium impact magnitude for contamination and instability due to the unconfirmed nature of the backfill used to restore the open cast mine.

10.5.2 The ground conditions in Area C are identified as having Low and Medium impact magnitudes for contamination and instability respectively, with the latter being associated with potential mine entry features.

Embedded Mitigation

10.5.3 The likelihood of effects (damage) due to ground conditions can be reduced through design, e.g., layout optimisation of the Proposed

Development to locate structures away from mine entries and compressible ground.

10.5.4 Impacts to ancillary buildings are not anticipated as these will comprise prefabricated metal containers or GRP kiosks placed on a compacted aggregate platform and/or concrete pads, i.e., these structures will be able to tolerate a degree of differential ground movement without affecting operation.

10.5.5 The majority of Work No. 2 – Grid Connection Infrastructure will be DNO asset and will be built and operated to their specifications. The DNO has a statutory obligation under the Electricity Act 1989[51] to develop and maintain an efficient, coordinated, and economical electricity transmission/distribution system. Their assets must be fit for purpose on a specific site. The DNO therefore will not permit the substation and external electrical equipment to be built if it will not be safe for and from the environment. It is further noted that the grid connection infrastructure is located within the greenfield land in Area C and is not located within 50m of any known, recorded mine entries.

10.5.6 Impacts to peat deposits will be similarly managed through design, with the areas of proven peat deposits (as per Appendix 10.3) excluded from construction of Work No. 1 (Solar PV infrastructure) **[REF: 2.3]**, Work No. 2 (Grid Connection Infrastructure), and Works 4 and 5 **[REF: 2.3]** as shown on the Parameter Plan (ES Figure 3.4) and the Exclusion Areas (ES Figure 3.5) **[REF: 6.2]**.

Construction Phase

Construction Phase – Human Health

10.5.7 This receptor is assigned a Medium sensitivity value and will have a short duration exposure to ground conditions during construction. The ground conditions (potential contaminated backfill in Areas A, B, and D and coal mine gases and mine entries in Area C) have been assigned a Medium

[51] HM Government (1989). Electricity Act 1989 c. 29.

impact magnitude resulting in a **Moderate Adverse** effect, which is **Significant**.

Construction Phase – Surface Water

10.5.8 This receptor is assigned a Medium sensitivity value. If excavated arisings are stockpiled near the boundaries between Work Nos. 1 to 5 and Work No. 6, there is the potential for contaminated run-off and / or organic-rich sediments to enter surface waters. The worst-case effect is identified as **Moderate Adverse** (which is **Significant**), short duration and reversible as any stockpiles would be temporary pending backfill into the cable trenches.

Construction Phase – Groundwater

10.5.9 This receptor is assigned a Medium sensitivity value. The grid connection infrastructure within Area C (Work No. 2) is likely to include foundations for buildings or structures which could create preferential pathways for contamination to reach groundwater. Existing contamination is not anticipated in the areas identified for the grid connection infrastructure because of the lack of mining history and long-standing agricultural use of this part of the Site, and therefore any effects to groundwater during the construction phase are related to the creation of new contamination.

10.5.10 The solar PV arrays are proposed in some areas where naturally elevated metals concentrations might be present. There is potential for the installation of the framework posts to create preferential pathways for new contamination introduced during construction to migrate to groundwater. It should be noted that there is not anticipated to be an existing low permeability layer between the surface soils and the mine backfill (i.e., water is anticipated to be able to freely infiltrate into the backfill) and any existing naturally derived elevated metals concentrations are within the material into which the piles would penetrate (i.e., the 'contamination' is already within the material at depth, rather than allowed to migrate downwards). The effect is identified as **Minor Adverse, not Significant**, temporary, and irreversible.

Construction Phase – Built Environment

10.5.11 This receptor is assigned a Very Low sensitivity value. Using the worst-case magnitude of impact of Moderate, the effect is **Negligible** (which is **not Significant**), which is likely to be reversible (through repair).

Construction Phase – Soils (Resource) including peat

10.5.12 This receptor is assigned a High sensitivity value. In the absence of any mitigation there is the potential for construction activities e.g., vehicle tracking, excavation, siting of compounds etc., to lead to a permanent loss of soil functions or soil volumes over an area of less than 5ha, i.e., a magnitude of impact of Minor. The effect is therefore **Moderate Adverse** which is **Significant**.

Construction Phase – Geomorphological Features / Natural Assets

10.5.13 Receptors of this type have not been identified within the study area therefore there are no effects to assess.

Operational Phase

Operational Phase – Human Health

10.5.14 This receptor is assigned a Medium sensitivity value and will have a short duration exposure to ground conditions during maintenance works. The ground conditions (potential contaminated backfill in the north of the Site and coal mine gases and mine entries in the south of the Site) have been assigned a Medium impact magnitude resulting in a **Moderate Adverse** effect which is **Significant**. The identified embedded mitigation does not alter the magnitude of effect but does reduce the likelihood of effects occurring as works can be planned cognisant of the residual ground conditions.

Operational Phase – Surface Water

10.5.15 During the operational phase the ground conditions will be the same as baseline and the magnitude of impact is therefore Very Low and the effect is **Negligible** and **not Significant**.

Operational Phase – Groundwater

10.5.16 During the operational phase the ground conditions will be the same as baseline. The magnitude of impact is therefore Very Low, and the effect is **Minor Adverse** and **not Significant**.

Operational Phase – Built Environment

10.5.17 This receptor is assigned a Medium sensitivity value. Using the worst-case magnitude of impact of Medium, the effect is **Moderate Adverse** which is **Significant**, and which is likely to be reversible (through repair).

Operational Phase – Soils (Resource) Including Peat

10.5.18 This receptor is assigned a High sensitivity value. In the absence of any mitigation there is the potential for operational phase activities, e.g., use of access roads/tracks around the Site to lead to a permanent loss of soil functions or soil volumes. However, as the area of potential impact is less than 5 ha the magnitude of impact is Minor. The effect is therefore **Moderate Adverse** which is **Significant**.

Operational Phase – Geomorphological Features / Natural Assets

10.5.19 Receptors of this type have not been identified within the Study Area therefore there are no effects to assess.

Decommissioning Phase

Decommissioning Phase – Human Health

10.5.20 This receptor is assigned a Medium sensitivity value and will have a short duration exposure to ground conditions during construction. The ground conditions (potential contaminated backfill in Areas A, B, and D and coal mine gases and mine entries in Area C) have been assigned a Medium impact magnitude resulting in a **Moderate Adverse** effect, which is **Significant**.

Decommissioning Phase – Surface Water

10.5.21 This receptor is assigned a Medium sensitivity value. Should the decommissioning phase involve excavation, such as removal of

foundations and soil stockpiling, near the boundaries between Work Nos. 1 to 5 and Work No. 6, there is the potential for contaminated run-off and / or organic-rich sediments to enter surface waters. The worst-case effect is identified as **Moderate Adverse** (which is **Significant**), short duration and reversible as any stockpiles would be temporary pending backfill into the excavations.

Decommissioning Phase – Groundwater

10.5.22 This receptor is assigned a Medium sensitivity value. The Grid Connection Infrastructure within Area C (Work No. 2) is likely to include foundations for buildings or structures, removal of which could create preferential pathways for contamination to reach groundwater. Existing contamination is not anticipated in the areas identified for the grid connection infrastructure because of the lack of mining history and long-standing agricultural use of this part of the Site, and therefore any effects to groundwater during the decommissioning phase are related to the creation of new contamination.

10.5.23 The solar PV arrays are proposed in some areas where naturally elevated metals concentrations might be present. There is potential for the removal of the framework posts to create preferential pathways for new contamination introduced during decommissioning to migrate to groundwater. The effect is identified as **Minor Adverse, not Significant**, temporary, and irreversible.

Decommissioning Phase – Built Environment

10.5.24 This receptor is assigned a Very Low sensitivity value. Using the worst-case magnitude of impact of Moderate, the effect is **Negligible** (which is **not Significant**), which is likely to be reversible (through repair).

Decommissioning Phase – Soils (Resource) Including Peat

10.5.25 This receptor is assigned a High sensitivity value. In the absence of any mitigation there is the potential for construction activities e.g., vehicle tracking, excavation, siting of compounds etc., to lead to a permanent loss of soil functions or soil volumes over an area of less than 5ha, i.e., a

magnitude of impact of Minor. The effect is therefore **Moderate Adverse** which is **Significant**.

Decommissioning Phase – Geomorphological Features / Natural Assets

10.5.26 Receptors of this type have not been identified within the study area therefore there are no effects to assess.

10.6 Mitigation Measures

10.6.1 The following secondary and tertiary (additional) mitigation measures have been identified for the construction and operational phases.

Secondary Mitigation – Construction Phase

Ground Investigation

10.6.2 As recommended by the Phase 1 GCA (Appendix 10.1) and secured by the OCEMP an intrusive ground investigation will be undertaken post-consent and will inform the CEMP and the detailed design for those aspects of the Proposed Development which are at risk and are subject to potential geo-environmental and / or instability (including investigation to determine the location of historical mine entries).

10.6.3 The aim of the ground investigation would be to investigate and characterise the near-surface soils, such that (following laboratory analysis and assessment) appropriate design parameters can be defined, and any required mitigation measures can be designed, including procedures for management of unexpected contamination.

Detailed Design of the Proposed Development

10.6.4 The design and layout of the works and other associated infrastructure will be informed by a consideration of appropriate materials, geo-environmental hazards, instability hazards, and modelling undertaken by the designer.

10.6.5 The design of the Proposed Development will seek to avoid siting structures in areas where hazards relating to coal mining including mine

entries, potential shallow mine workings and the former opencast pit highwall are present, as identified in the CMHA (Appendix 10.2, Figure 3.1). Ground investigation will be undertaken to locate and delineate, as far as is reasonably practicable, the extent of these hazards, with the results of the investigation used to inform the design.

10.6.6 The design of the Proposed Development will avoid the construction of non-compatible infrastructure in areas where compressible peat deposits have been identified in the Peat Survey Report (Appendix 10.3). Should construction activity of Work No. 3 **[REF: 2.3]** be required to take place within identified areas of peat measures outlined in the OSMP (Appendix 5.3) in relation to peat will be adhered to. In addition, a FWRA will be prepared to include consideration of whether the Proposed Development alters the water balance for the peat deposits.

10.6.7 Geoenvironmental risks have been avoided through appropriate siting and construction methods. Ground investigation will be undertaken post-consent to provide geoenvironmental and ground stability data, with the findings of the subsequent assessment and, where required, any remediation strategy, used to inform the CEMP.

Outline Construction and Environmental Management Plan

10.6.8 An OCEMP has been prepared (Appendix 5.1) and outlines how the construction of the Proposed Development will avoid, minimise, or mitigate effects on the environment and surrounding area.

Soil Management Plan

10.6.9 The OSMP (Appendix 5.3) sets out (i) the best practice (embedded mitigation), and (ii) a framework of practical mitigation measures that the Principal Contractor will develop and implement during the construction, operation, and decommissioning phases to safeguard soil resources on Site. The Principal Contractor will be required to monitor the works to ensure they comply with the SMP during construction, operation, and

decommissioning, in accordance with the *'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'*[52].

10.6.10 The reuse of soils can be undertaken subject to the materials being chemically and physically suitable for the intended construction and complying with one of the following:

- Soils that are excavated and temporarily stored prior to being returned to the original excavation would not be considered a waste. This activity does not meet the definition of a waste as the holder does not intend to discard it, nor is required to discard it;
- Article 2.1 (c) of the Waste Framework Directive – *'naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.';*
- A waste exemption[53] that is registered;
- Environment Permit - Standard rules to use waste in a deposit for recovery operations (construction, reclamation, restoration or improvement of land other than by mobile plant) or Bespoke permit.
- CL: AIRE Definition of Waste ('DoW') Code of Practice ('CoP')[54]; and
- A Regulatory Position Statement.

10.6.11 The OSMP (Appendix 5.3) presents the measures to be adopted to maintain and where possible improve the quality and quantity of soil resources (i.e., topsoil and subsoil) at the Site in its current physical condition (e.g., soil depth, soil texture, soil structure, soil drainage status), chemical condition (e.g., pH level, nutrient status of available phosphorus, available potassium, available magnesium, and soil organic matter (SOM) content, to maintain soil functions primarily during the construction, and decommissioning phases of the Proposed Development.

10.6.12 Post-consent, a SMP will be produced for the construction phase which must be substantially in accordance with the OSMP. The SMP will sit alongside of the CEMP. The SMP will be secured by the DCO through a Requirement.

[52] HM Government (2018). DEFRA. Construction Code of Practice for the Sustainable Use of Soils on Construction Sites,

[53] Any of the relevant exemptions as described at https://www.gov.uk/government/collections/waste-exemption-guides

[54] CL:AIRE, 2011, The Definition of Waste: Development Industry Code of Practice Version 2.

10.6.13 An FDMP is provided (Appendix 5.4) which will substantially be in accordance with a DMP suite. The DMP suite will include a SMP that specifies soil management during the decommissioning phase and should include an appropriate aftercare plan.

Tertiary Mitigation – Construction Phase

Legislative Requirements

10.6.14 The Construction (Design and Management) Regulations 2015[55] (CDM) regulate the health, safety and welfare of construction projects and will apply to the Proposed Development. A Principal Designer and a Principal Contractor ('PC') will be appointed to plan, manage, monitor, and coordinate health and safety during the pre-construction and construction phases, respectively. The PC will have responsibility for ensuring legislative compliance and obtaining all permits/licenses as required.

10.6.15 The CDM Regulations require a pre-construction information pack ('PCIP') to be provided by the Applicant (the 'Client' under CDM) or by the Principal Designer if the Client delegates this duty. The pack contains all information that is held or is readily available. The PCIP will be used by the PC to prepare construction and decommissioning phase risk assessments and method statements. The risk assessments will be informed by the Phase 1 GCA and CMHA reports (Appendices 10.1 and 10.2) and augmented with intrusive investigation if deemed necessary.

Secondary Mitigation – Operational Phase

10.6.16 The secondary mitigation elements identified during the construction phase will address the potential pollutant linkages in the operational phase.

10.6.17 The impacts of import / re-use of suitable materials alongside any other mitigation found to be required following ground investigation and subsequent assessment will be realised during the operational phase.

[55] HM Government (2015). The Construction (Design and Management) Regulations 2015 No. 51.

Tertiary Mitigation – Operational Phase

Legislative Requirements

10.6.18 Legislation that aims to prevent the generation of new contamination from the storage and use of chemicals includes:

- Pollution Prevention and Control (England and Wales) Regulations 2000[56]; and
- Control of Pollution (Oil Storage) Regulations 2001[57].

10.6.19 Adherence to the requirements within the above, as well as the measures outlined in section 10 (Pollution and Contamination Prevention) of the OCEMP (Appendix 5.1) will contribute to the prevention of new contamination being generated during the operational phase and the avoidance of adverse operational phase effects.

Secondary Mitigation – Decommissioning Phase

10.6.20 A FDMP has been prepared (Appendix 5.4) which provides a framework for the future decommissioning of the Proposed Development and restoration of the land. A framework is provided to reflect the amount of time that will elapse between the construction of the Proposed Development and the time at which a document suite would be required for the management of environmental effects associated with its decommissioning.

10.6.21 The effects of decommissioning are likely to be of a similar magnitude to those associated with construction as the anticipated level of activity and activities to be undertaken, and thus the potential for new contamination to be introduced, are broadly the same.

10.6.22 In respect of existing contamination in the ground, the construction of the Proposed Development will resolve certain known-unknowns, e.g., the potential for unexpected contamination which, if encountered during construction, will be managed and remediated appropriately such that

[56] HM Government (2000). The Pollution Prevention and Control (England and Wales) Regulations 2000 No. 1973.
[57] HM Government (2001). Control of Pollution (Oil Storage) Regulations 2001 No. 2954.

hazards present during construction are unlikely to be present during decommissioning.

10.7 Residual Effects

10.7.1 The assessment of residual effects presented in this section considers the additional mitigation measures defined in section 10.6 above. As discussed in section 10.3, remedial or mitigation solutions that do not reduce the quantum of contamination present (relative to the baseline condition) mean that the assessed magnitude of the impact does not change despite implementing mitigation. Such solutions will however reduce the likelihood of an impact being realised.

Construction Phase

Construction Phase – Human Health

10.7.2 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.3 The additional mitigation measures described above are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Construction Phase – Surface Water

10.7.4 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.5 The additional mitigation measures described above are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Construction Phase – Groundwater

10.7.6 In the absence of secondary and tertiary mitigation measures a Minor Adverse effect has been identified.

10.7.7 The additional mitigation measures described above are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Construction Phase – Buildings and Structures

10.7.8 In the absence of secondary and tertiary mitigation measures a Negligible (not Significant) effect has been identified.

10.7.9 The additional mitigation measures described above are considered to further reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect remaining as **Negligible (not Significant)**.

Construction Phase – Soil Resource Including Peat

10.7.10 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.11 Additional mitigation measures are outlined in the OCEMP (Appendix 5.1) and OSMP (Appendix 5.3). Adoption of these measures will enable the protection of soil resources during the construction phase and will lead to no discernible loss or reduction of soil functions or soil volumes that restrict current or proposed land use, i.e., a magnitude of impact of Negligible. The residual effect is therefore **Negligible** (**not Significant**).

Operational Phase

Operational Phase – Human Health

10.7.12 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.13 The additional mitigation measures described above are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Operational Phase – Surface Water

10.7.14 In the absence of secondary and tertiary mitigation measures a Negligible effect has been identified.

10.7.15 Whilst it is not anticipated that additional mitigation will be required for this receptor during the operational phase, the inclusion of any additional mitigation measures found to be necessary following ground investigation and subsequent assessment will further reduce the likelihood of any effect. A **Negligible (not Significant)** residual effect has therefore been identified.

Operational Phase – Groundwater

10.7.16 In the absence of secondary and tertiary mitigation measures a Negligible effect has been identified.

10.7.17 A **Negligible (not Significant)** residual effect has therefore been identified.

Operational Phase – Buildings and Structures

10.7.18 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.19 The measures described above are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Operational Phase – Soil Resource including Peat

10.7.20 In the absence of secondary and tertiary mitigation measures a Moderate Adverse effect has been identified.

10.7.21 Following adoption of the construction phase mitigation measures outlined in the OSMP (Appendix 5.3) soil resource will have been conserved. Operational phase activities relating to soils management will be detailed in the Landscape Environmental Management Plan ('LEMP') (to be substantially in accordance with the OLEMP (Appendix 7.7) **[REF: 6.3]** and are expected to lead to no discernible loss or reduction of soil

functions or soil volumes that restrict current or proposed land use, i.e., a magnitude of impact of Negligible. The operational phase residual effect is therefore **Negligible (not Significant)**.

Decommissioning Phase

Decommissioning Phase – Human Health

10.7.22 In the absence of additional mitigation measures a temporary Moderate Adverse effect has been identified. The operational phase additional mitigation measures described in section 10.6 are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Decommissioning Phase – Surface Water

10.7.23 Should the decommissioning phase involve excavation such as removal of foundations and soil stockpiling, in the absence of additional mitigation measures a temporary Minor Adverse effect has been identified. The additional mitigation measures described in section 10.6 are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible** (**not Significant**).

Decommissioning Phase – Groundwater

10.7.24 Should the decommissioning phase involve excavation such as removal of foundations and soil stockpiling, in the absence of additional mitigation measures a temporary Moderate Adverse effect has been identified. The additional mitigation measures described in section 10.6 are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

Decommissioning Phase – Buildings and Structures

10.7.25 In the absence of secondary and tertiary mitigation measures a Negligible (not Significant) effect has been identified.

10.7.26 The inclusion of the additional mitigation measures does however alter the likelihood of the effect occurring. The measures described in section 10.6

are considered to further reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect remaining as **Negligible (not Significant)**.

Decommissioning Phase – Soil Resource Including Peat

10.7.27 In the absence of additional mitigation measures a permanent Major Adverse effect has been identified. The additional mitigation measures described in section 10.6 are considered to reduce the likelihood of the effect occurring from 'Likely' to 'Unlikely' with the resulting most likely residual effect being **Negligible (not Significant)**.

10.8 Cumulative Effects

10.8.1 The approach to cumulative impact assessment considers whether the Site is within a zone of influence associated with contamination or instability. This is informed by professional judgement and considerations of the following:

- Release of contaminated dust – typical wind direction and distance;
- Release of contaminated water – flow direction;
- Release of contaminated gases – typical wind direction and distance for above ground releases and a maximum of 250m for below ground; and
- Alterations to adjacent / nearby ground levels or groundwater levels that could induce land stability changes.

10.8.2 The cumulative schemes to be considered are outlined in Table 2.6 of Chapter 2 – EIA Methodology.

10.8.3 The DMRB[58] provides a specific methodology for assessing the significance of cumulative impacts. This has been used as a guide for the purposes of this assessment by considering:

- Which receptors or resources are affected?
- How will the activity or activities affect the condition of the resource?
- What are the probabilities of such effects occurring?
- What ability does the receptor/resource have to absorb further effects before change becomes irreversible?

[58] National Highways (2019) DMRB.

10.8.4 Identified cumulative impacts are categorised as 'construction' (temporary impacts that will only occur during the construction phase) or 'operational' (permanent effects that will be present during the operational phase). The significance of the identified effects is defined in line with DMRB guidance, as set out below:

- **Severe** – Effects that the decision-maker must take into account as the receptor/resource is irretrievably compromised;
- **Major** – Effects that may become key decision-making issues;
- **Moderate** – Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance;
- **Minor** – Effects that are locally significant; and
- **Not significant** – Effects that are beyond the current forecasting ability or are within the ability of the resource to absorb such change.

10.8.5 To enable consideration of a worst-case situation, it is assumed where development consent has been granted or has been applied for, developments could be constructed at the same time as the Proposed Development or in the following months, thus giving rise to potential construction-related cumulative effects.

10.8.6 The nearest of the identified potential cumulative schemes is Lostrigg Solar (EN0110004), located immediately north of the Site. This scheme comprises a proposed solar farm with over 50MW capacity, solar PV modules, and associated mounting structures, inverters, transformers, switch gear, and control equipment, a substation, point of connection, energy storage equipment, and underground on and off-road cabling.

10.8.7 The following text considers impacts of releases of contamination to the ground, and to the atmosphere.

Cumulative Schemes – Releases of Contamination to Groundwater

10.8.8 There is potential that releases of contamination at the Site into groundwater, could migrate to the adjacent cumulative scheme.

10.8.9 The Phase 1 GCA (Appendix 10.1) assessed the construction phase and operational phase risks to groundwater, in absence of any mitigation, as Very Low.

10.8.10 The Geo-Environmental Desk Study and Preliminary Risk Assessment prepared for Lostrigg Solar[59] assessed the risks to groundwater (in absence of mitigation) as Very Low to Low.

10.8.11 Construction of the Proposed Development will be undertaken in accordance with the mitigation measures described in the sections above to minimise impacts from contamination. It is assumed that the Lostrigg will similarly be governed by a CEMP or Code of Construction Practice and will apply best practice construction methods to minimise impacts from contamination.

10.8.12 Based on the above, the likelihood of a release of contamination to groundwater during construction of the Proposed Development, which then subsequently migrates to the adjacent scheme is considered highly unlikely. Similarly, the likelihood of a release of contamination to groundwater during construction of Lostrigg Solar, which then subsequently migrates to the Site is considered highly unlikely.

10.8.13 The residual construction and operational phase impacts to groundwater, in the absence of cumulative schemes have been assessed as Negligible. It is considered that the very low likelihood of a release of contamination and the incorporation of the mitigation measures described above means that the cumulative impact due to releases of contamination to groundwater are **Negligible** and **not Significant**.

10.8.14 The next nearest scheme is located approximately 1.3km west of the Site 'Land at Lillyhall North' (FUL/2021/0009). Based on the significant distance between the Site and this cumulative scheme it is considered that

[59] Wardell Armstrong, 2024, Geo-Environmental Desk Study and Preliminary Risk Assessment, ref: CA12978 v1.0. Available at [redacted] Accessed October 2024

a release of contamination at the Site into the groundwater is unlikely to be discernible at this, or the other more distant cumulative schemes.

Cumulative Schemes – Releases of Contamination to Air

10.8.15 Releases of contamination (were it to be present) to the air would likely be discernible at the adjacent solar scheme but would not be discernible over the distance to the next nearest of the identified cumulative schemes. The primary receptor for releases to air is human health.

10.8.16 The Phase 1 GCA (Appendix 10.1) assessed the construction phase risk to off-site human health, in absence of any mitigation, as low, assuming the use of the adjacent land remains agricultural. With the introduction of an adjacent human health receptor (construction and maintenance workers working on / at Lostrigg Solar) the assessed risk is increased to moderate.

10.8.17 The Geo-Environmental Desk Study and Preliminary Risk Assessment prepared for Lostrigg Solar does not assess the risks to off-site human health. The Lostrigg Solar assessment considers the risks to on-site human health during construction of Lostrigg Solar (in absence of mitigation) to be moderate to low. The assessment also assumes that in absence of ground disturbance during the operational phase, risks to human health are not present. Construction of the Proposed Development will be undertaken in accordance with the mitigation secured by the OCEMP. It is assumed that Lostrigg Solar will similarly be governed by a CEMP or equivalent and will apply best practice construction methods to minimise impacts from contamination.

10.8.18 Based on the above, the likelihood of a release of contamination to air during construction of the Proposed Development, and Lostrigg Solar is considered ‘Unlikely’.

10.8.19 It is considered that the low likelihood of a release of contamination and the incorporation of the mitigation measures described above means that the cumulative impact due to releases of contamination to air are **Negligible** and **not Significant**.

10.8.20 The next nearest scheme is located approximately 1.3km west of the Site Land at Lillyhall North. Because of the significant distance between the Site and this cumulative scheme it is considered that releases of contamination to the air would not be discernible over the distance to this, or the other more distant cumulative schemes.

Cumulative Schemes – Land Stability

10.8.21 The Proposed Development in the vicinity of Lostrigg Solar comprises PV arrays only. These arrays will be constructed on small-scale piled (driven or screw) foundations or will be ballasted with 'concrete shoes'. Such a form of construction, in the absence of any significant excavation, is not anticipated to introduce land stability hazards to Lostrigg Solar.

10.8.22 Lostrigg Solar documentation outlines that the cumulative scheme is within a similar mining setting. Given the similarity in geological setting and development infrastructure, it is anticipated that Lostrigg Solar will utilise similar approach to solar array construction as the Proposed Development. Such a form of construction, in the absence of any significant excavation, is not anticipated to introduce land stability hazards to the Site.

10.8.23 The next nearest scheme is located approximately 1.3km west of the Site Land at Lillyhall North. On the basis of the significant distance to the remaining identified potential cumulative schemes, cumulative land stability effects are not anticipated.

10.8.24 Cumulative effects to land stability are therefore considered to be **Negligible** and **not Significant**.

10.9 Summary

10.9.1 This chapter assesses the potential effects from the disturbance of ground and contamination on human health and the environment during the proposed construction, operational, and decommissioning phases. This chapter also assesses the effects of potentially contaminated ground or groundwater and ground instability on the Proposed Development as well

as the effects of construction of the Proposed Development upon soil resources.

10.9.2 A Phase 1 GCA was undertaken (Appendix 10.1) **[REF: 6.3]** to identify potential land contamination sources, instability hazards and sensitive receptors within the study area and a preliminary conceptual model was developed identifying where sources and receptors may interact through pathways (also known as a contaminant linkage).

10.9.3 The desk-based study identified that on-Site potential sources of contamination are likely to be limited to:

- Backfill within the historical opencast coal mine in the north of the Site (Areas A, B, and D) which may contain elevated concentrations of metals;
- Agrichemicals (residual and point of use, not storage) within the agricultural land in Area C;
- Access tracks potentially formed using imported materials of unknown origin which may contain contaminants, including asbestos-containing materials; and
- Mine gas emissions (noting that this hazard would only apply to entry into confined spaces during construction and the Proposed Development where structures with enclosed spaces are present).

10.9.4 Off-Site activities with the potential to generate contamination are the garage/car dealer immediately to the southeast and Rigg House Farm to the east, where bulk storage of fuels and chemicals may have taken place.

10.9.5 Following appropriate ground investigation, monitoring and assessment work undertaken prior to commencement of construction, any mitigation measures found to be necessary will be included in the design and construction of the Proposed Development.

10.9.6 Embedded mitigation to manage ground stability hazards, damage to soil resources, and the release of any historical ground contamination (if present) and creation of new ground contamination will be provided through detailed design (informed by ground investigation and through use of a CEMP and SMP, and also by avoidance of construction in areas

identified peat) and through DNO obligations under the Electricity Act 1989.

10.9.7 The potential construction and operational phase effects of the Proposed Development have been assessed. Without the inclusion of the secondary and tertiary mitigation measures, the assessed effects range from **Negligible** to **Moderate Adverse**. The inclusion of the secondary and tertiary mitigation does not alter the assessed effect magnitude but does reduce the likelihood of the effects being realised, making the most likely effects to be **Negligible**.

10.9.8 In absence of the secondary and tertiary mitigation measures, the potential decommissioning phase effects of the Proposed Development are assessed to be **Minor** to **Major Adverse**. The inclusion of the mitigation does not alter the assessed effect magnitude but does reduce the likelihood of the effects being realised, making the most likely effects to be **Negligible**.

Table 10.9: Table of Significance – Ground Conditions

Potential Effect	Nature of Effect	Significance	Secondary / Tertiary Additional Mitigation	Geographical Importance						Residual Effect
				I	UK	E	R	UA	L	
Construction Phase										
Human Health exposure to potential contamination through ground disturbance	Temporary	**Moderate Adverse**	Design of the Proposed Development to be informed by ground investigation and interpretative assessment. Where necessary remediation / mitigation measures will be included as part of the design to break construction phase pollutant linkages. The CEMP to be substantially in accordance with the measures set out in the OCEMP. The CEMP will provide construction phase controls and following all appropriate legislative requirements during the construction phase.							Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon surface water	Temporary	**Moderate Adverse**					X			Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon groundwater	Temporary	Minor Adverse					X			Negligible
Buildings and Structures exposure to potential contamination	Temporary	Negligible							X	Negligible
Loss of soil resource due to ground disturbance	Permanent	**Moderate Adverse**	Outline Soil Management Plan (OSMP) (Appendix 5.3) sets out how soils are to be managed. The SMP will be substantially in accordance with the OSMP.						X	Negligible
Operational Phase										
Human Health exposure to potential contamination through ground disturbance	Temporary	**Moderate Adverse**	The CEMP to be substantially in accordance with the measures in the OCEMP, to define what materials can / cannot be re-used and require that materials brought to the Site are suitable for use from the perspective of human health during the operational phase.							Negligible

Potential Effect	Nature of Effect	Significance	Secondary / Tertiary Additional Mitigation	Geographical Importance						Residual Effect
				I	UK	E	R	UA	L	
Mobilisation of existing potential contamination through ground disturbance impacting upon surface water	Temporary	Negligible	Whilst it is not anticipated that additional mitigation will be required for these receptors during the Operational phase, any additional mitigation measures found to be necessary following ground investigation and subsequent assessment will be included.				X			Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon groundwater	Temporary	Minor Adverse					X			Negligible
Buildings and Structures exposure to potential contamination	Temporary	**Moderate Adverse**	Design, informed by ground investigation, such that the proposed structures are suitably located, geotechnically designed and constructed of appropriate materials.						X	Negligible
Loss of soil resource due to ground disturbance	Permanent	**Moderate Adverse**	Adoption of additional mitigation measures at the construction phase will safeguard soil (resource) during the operational phase.						X	Negligible
Decommissioning Phase										
Human Health exposure to potential contamination through ground disturbance	Temporary	**Moderate Adverse**	A DMP suite to provide decommissioning phase controls and following all appropriate legislative requirements during the construction phase, this will be substantially in accordance with the FDMP.							Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon surface water	Temporary	Minor Adverse					X			Negligible
Mobilisation of existing potential contamination through ground disturbance impacting upon groundwater	Temporary	**Moderate Adverse**					X			Negligible

Potential Effect	Nature of Effect	Significance	Secondary / Tertiary Additional Mitigation	Geographical Importance						Residual Effect
				I	UK	E	R	UA	L	
Buildings and Structures exposure to potential contamination	Temporary	Negligible							X	Negligible
Loss of soil resource due to ground disturbance	Permanent	**Major Adverse**	Preparation of Decommissioning Phase Soil Management Plan (DSMP), to be substantially in accordance with the FDMP, which sets out how soils are to be managed during the decommissioning phase.						X	Negligible
Cumulative Effects										
Construction Phase										
None Identified.	n/a	Negligible	None Identified						X	Negligible
Operational Phase										
None Identified.	n/a	Negligible	None Identified						X	Negligible
Decommissioning Phase										
None Identified.	n/a	Negligible	None Identified						X	Negligible

Nature of Effect * Permanent or Temporary Short-term, Medium-term, or Long-term
Significance** Major/ Moderate/ Minor/ Negligible Beneficial/ Adverse
Geographical Importance *** I = International; UK = United Kingdom; E = England; R = Regional; UA = Unitary Authority; L = Local
Residual Effects **** Major / Moderate / Minor / Negligible Beneficial / Adverse