



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 3, Chapter 9: Agriculture and Soils

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Glossary

Term	Meaning
Agricultural Land Classification (ALC)	Agricultural Land Classification is a grading system used to assess and compare the quality of agricultural land in England and Wales. ALC agricultural land is graded from 1, the highest quality land to 5, the lowest quality land.
Alternating Current (AC) cables	AC cables that will connect the proposed onshore land substation to the National Grid Hawthorn Pit Substation.
Arable land	Land suitable for growing crops.
Best and most versatile (BMV)	Agricultural land that is defined as ALC grade 1, 2 or 3a.
Blue Onshore Land Substation (LSS) Option Area	Proposed location option for the onshore LSS, located west of the A19 and south of the access road to the Jade Business Park.
Commitments	Measures (embedded mitigation & secondary) to be adopted during the construction, operation and maintenance, and decommissioning phases of the Morven Hawthorn Pit Grid Connection (MHPGC) Project.
Cumulative effect	For each environmental topic, the baseline environment will be characterised, and the likely significant effect will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent
Cumulative effects assessment	Assessment of the likely effects arising from the MHPFC Project alongside the likely effects arising from other proposed developments on the same receptor or resource.
Embedded mitigation	Measures included as part of the project design. Includes both primary and tertiary mitigation.
Environmental Impact Assessment (EIA)	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Farm Holding	Buildings and associated land used for agricultural purposes including horticulture, livestock, grazing and various other uses which are commercial in nature.
Green Onshore LSS Option Area	Proposed location option for the onshore land substation, located between Jade Business Park (Spring Rd, Murton, Seaham SR7 9DR) and the National Grid Hawthorn Pit Substation.
Inter-related effects	Effects that may arise from the interactions between different EIA topic effects considered within the alone assessment, potentially leading to more significant effects than if they were to be considered in isolation.

Term	Meaning
Landfall	The area in which the offshore export cables make landfall (come onshore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area between the trenchless technique exit pits and the transition joint bay inclusive of all construction works.
Magnitude	A combination of the spatial extent, duration, frequency and reversibility of an impact.
Maximum design scenario (MDS)	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the MHPGC Project.
Mean High Water Springs (MHWS)	The average tidal height throughout the year of two successive high waters during those periods of 24 hours when the range of the tide is at its greatest.
Mean Low Water Springs (MLWS)	The average height of the low water levels of each pair of successive low waters during the periods of about 24 hours when the tidal range is at its greatest.
MHPGC Project Scoping Report	A Scoping Report for the MHPGC Project, scoping the likely significant effects of the project on the environment, was submitted and accepted by Planning Inspectorate (PINS) and submitted to the Scottish Ministers, via the Marine Directorate – Licencing Operations Team (MD-LOT) in February 2025.
MHPGC Project Scoping Opinions	Separate scoping opinions received from the Planning Inspectorate (on behalf of the Secretary of State) and MD-LOT (on behalf of the Scottish Ministers) and the Marine Management Organisation (MMO) in response to the MHPGC Scoping Report prepared by the Applicants. The MHPGC Scoping Opinions contain the range of issues that the Planning Inspectorate, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the EIA process.
MHPGC Project	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore export cables, the onshore LSS and AC connection cables.
MHPGC PEIR Red Line Boundary: Onshore	Spatial extent used to define the environmental assessment within the PEIR. The area within which all onshore components of the MHPGC Project will be located landward of MHWS, including areas required on a temporary basis during construction and/or decommissioning (e.g. construction compounds).
MHPGC Project Preliminary Environmental Information Report (PEIR)	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
National Cycle Route	Routes listed on the National Cycle Network, which is comprised of a UK-wide network of paths and routes for walking, wheeling, cycling and exploring outdoors.
National Grid Hawthorn Pit Substation	The National Grid substation at Hawthorn Pit, County Durham, which the AC connection cables will connect into from the onshore land substation.

Term	Meaning
Onshore export cables	High Voltage Direct Current (HVDC) cables which bring electricity from the Transition Joint Bay (TJB) to the onshore land substation.
Onshore land substation (LSS)	A purpose-built site comprising a compound containing the electrical components for converting the HVDC to High Voltage Alternating Current (HVAC) power. The LSS site associated with the MHPGC Project adjusts the power quality and power factor to meet the requirements of power supply being fed to the National Grid Hawthorn Pit Substation.
Operations and maintenance phase (O&M)	The operational and maintenance phase of the MHPGC Project.
Planning Inspectorate (PINS)	The Planning Inspectorate is the government agency that administers and examines Development Consent Order (DCO) applications for Nationally Significant Infrastructure Projects. PINS manages the application process, oversees consultation and examination, and makes a recommendation to the Secretary of State on whether consent should be granted.
Primary mitigation	Measures included as part of the location or design of the MHPGC Project made during the pre-application phase that are an inherent part of the MHPGC Project and do not require additional action to be taken. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the MHPGC Project, the parameters and associated commitments secured by the DCO and marine licence, or both.
Recreational resources	A collective term used for recreational facilities and assets (i.e., coastal areas, sports facilities, Heritage Coast, National Trust Land etc), Public Rights of Way (PRoW) and other promoted routes (i.e., National Cycle Routes (NCRs) and Long Distance Footpaths).
Residual effects	Effects that continue to exist after mitigation has been applied.
Secondary mitigation	Actions that will require further activity to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures both pre-mitigation and residual effects are presented.
Significance	Effect factor that is determined by the magnitude of impact along with the sensitivity of the receptor.
Tertiary mitigation	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.
The Study Area	For each environmental topic, the baseline environment will be characterised, and the potential environmental impacts will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which potential impacts of MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence).

Term	Meaning
Transboundary effects	Assessment of potential significant effects resulting from MHPGC Project on the interests of another EEA state(s).
Transboundary impact	Potential impacts resulting from MHPGC Project and affecting another European Economic Area (EEA) state.

Acronyms

Acronym	Meaning
AC	Alternating Current
ALC	Agricultural Land Classification
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BSSS	British Society of Soil Science
CEA	Cumulative Effect Assessment
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DCC	Durham County Council
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
ECow	Ecological Clerk of Works
ECP	England Coast Path
EIA	Environmental Impact Assessment
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IEMA	Institute of Environmental Management and Assessment
IQ	Institute of Quarrying
ISEP	Institute of Sustainability and Environmental Professionals
LEMP	Landscape and Ecological Management Plan
LSS	Onshore land substation
MAGIC	Multi-Agency Geographic Information for the Countryside
MAFF	Ministry of Agriculture, Fisheries and Food
MCAA	Marine and Coastal Access Act
MDS	Maximum Design Scenario

Acronym	Meaning
MHPGC	Morven Hawthorn Pit Grid Connection
MHCLG	Ministry of Housing, Communities and Local Government
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
NCR	National Cycle Route
NPPF	National Planning Policy Framework
NPS	National Policy Statements
ODMP	Operational Drainage Management Plan
OEP	Office for Environmental Protection
O&M	Operations and Maintenance
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PPG	Planning Practice Guidance
PRoW	Public Right of Way
SMP	Soil Management Plan
SocEnv	Society for the Environment
SoS	Secretary of State
SWGMP	Surface Water and Groundwater Management Plan
SWMP	Site Waste Management Plan
TJB	Transition Joint Bay
WC	Wetness Class

Units

Unit	Meaning
FCD	Field Capacity Days
ha	Hectare
km	Kilometre
m	Metre
m ²	Squared metre
m ³	Cubic metre
%	Percentage

9 Agriculture and Soils

9.1 Introduction

- 9.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary findings of the Environmental Impact Assessment (EIA) work undertaken to date for the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project'), as described in **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 9.1.1.2 The chapter considers the potential impacts and effects on agriculture and soils that could result from the construction, operation and maintenance (O&M) and decommissioning phases of the MHPGC Project. Specifically, it relates to the onshore elements of the MHPGC Project landward of Mean High Water Springs (MHWS) at landfall to the National Grid Hawthorn Pit Substation in England.
- 9.1.1.3 This chapter describes the methodology, datasets that have informed the preliminary assessment, baseline conditions, including future baseline, mitigation measures and the preliminary residual significant effects on agriculture and soils that could result from the MHPGC Project.
- 9.1.1.4 The assessment is informed by the following chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR;**
 - **Volume 1, Chapter 5: Policy and Legislation, of the PEIR;**
 - **Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PEIR;**
 - **Volume 3, Chapter 2: Water Resources and Flood Risk, of the PEIR.**
 -
- 9.1.1.5 The chapter also draws on information contained within the following annexes of the PEIR:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 1, Annex 4.2: Transboundary Screening, of the PEIR;**
 - **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR.**
- 9.1.1.6 This PEIR will offer a comprehensive overview of the MHPGC Project's potential environmental impacts and mitigation measures, presenting essential data to stakeholders for review and feedback. The PEIR will also be informed by the ongoing pre-application consultation process.
- 9.1.1.7 Following consultation on the PEIR, comments will be reviewed and considered, where appropriate, in preparation of the Environmental Statement (ES) that will accompany the application to the Planning Inspectorate (PINS) for development consent.

9.2 Legislative and policy context

9.2.1 Overview

- 9.2.1.1 The full relevant legislation and policy context for the MHPGC Project has been detailed in **Volume 1, Chapter 5: Policy and Legislation, of the PEIR**. This section sets out the legislation and planning policy that is relevant to the preliminary agriculture and soils assessment.

9.2.2 Legislation

The Environment Act 2021

- 9.2.2.1 The Environment Act 2021 passed into law in November 2021. It provides a framework and the legal basis for the establishment of the Office for Environmental Protection (OEP) but many of the associated targets, policies and regulations are yet to be established. The Environment Act 2021 requires organisations to pay regard to environmental principles including:
- The principle of preventative action, which means taking action to avert environmental damage;
 - The rectification at source principle, which means that if damage to the environment cannot be prevented it should be tackled at its origin;

- The polluter pays principle, which is the principle that those who cause pollution or damage to the environment should be responsible for mitigation or compensation;
- The precautionary principle, which states that where there are threats of serious or irreversible environmental damage, a lack of scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

9.2.2.2 The Act enhanced the 'biodiversity duty' which requires Public Authorities to consider what they can do to conserve and enhance biodiversity, agree related policies and objectives and act to deliver the same. Public authorities must also have regard to relevant Local Nature Recovery Strategies. Nationally significant infrastructure projects requiring development consent under the Planning Act 2008 will generally be required to achieve at least 10% Biodiversity Net Gain where an application for development consent is submitted on or after 2 November 2026.

Water Resources Act 1991 (as amended by the Water Act 2003)

9.2.2.3 The Water Resources Act 1991 (UK Government, 1991) provides a framework for the management of water resources, pollution control and certain flood and drainage functions; Part III contains provisions for the protection of controlled waters, including that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters.

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

9.2.2.4 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations') (UK Government, 2017) require that during screening of projects the planning authority and the Applicant must provide a description of any likely significant effects of the proposed development on the environment. Schedule 3 (Selection Criteria for Screening Schedule 2 Development) requires consideration of effects arising from *"the use of natural resources, in particular soil, land, water and biodiversity"* and that:

- *"2.(1) The environmental sensitivity of geographical areas likely to be affected by development must be considered, with particular regard, to—*
- *(b) the relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, ...) in the area and its underground."*

9.2.2.5 In Schedule 4 Information for Inclusion in Environmental Statements, the description of the development is to include:

- *"9.(d) an estimate, by type and quantity, of expected residues and emissions (such as... soil... and quantities and types of waste produced during the construction... and operation phases."*
- Schedule 4 (Information for Inclusion in Environmental Statements) explains that the description of the likely significant effects in the EIA is to include effects on land and soil (for example land take, loss of organic matter, soil erosion, compaction, or sealing).

Environmental Permitting (England and Wales) Regulations 2016

9.2.2.6 The Environmental Permitting (England and Wales) Regulations 2016 provide a consolidated framework for environmental permits and exemptions for waste operations and water discharge activities (previously consented under the Water Resources Act 1991). Discharge of silt-laden water (e.g., silty run-off from stripped soils or soil stockpiles) to surface water can result in prosecution under the Environmental Permitting (England and Wales) Regulations 2016.

The Hedgerow Regulations 1997

9.2.2.7 The Hedgerow Regulations 1997 includes legal provisions that protect 'important' hedgerows from damage or destruction, where 'important' is defined as hedgerows that have existed for 30 years or more and satisfy at least one of the criteria listed in Part II of Schedule 1 of the Hedgerow Regulations (UK Government, 1997). This provides some protection for soils supporting established vegetation and biodiversity.

9.2.3 National policy context

National Policy Statements

9.2.3.1 National Policy Statements (NPS) set out the primary policy framework for a Development Consent Order (DCO) under which the MHPGC Project will be considered. They set out the principles, requirements and considerations relevant to the examination of the application and whether development consent should be granted. **Table 9.1** provides details of the NPS relevant to agriculture and soils and how and where they are covered in the PEIR:

- Overarching NPS for energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2025a);
- NPS for electricity networks infrastructure (EN-5) (DESNZ, 2025c)

Table 9.1: Summary of the NPS provisions relevant to agriculture and soils

Summary of relevant NPS provisions	How and where considered in the PEIR
NPS EN-1	
Paragraph 5.11.3 of EN-1 states that <i>“although the re-use of previously developed land for new development can make a major contribution to sustainable development by reducing the amount of countryside and undeveloped greenfield land that needs to be used, it may not be possible for many forms of energy infrastructure”</i> .	The potential use of brownfield land for permanent infrastructure is explained in the baseline in Section 9.4 and in the assessment in Section 9.8 .
Paragraph 5.11.4 of EN-1 states that <i>“Development of land will affect soil resources, including physical loss of and damage to soil resources, through land contamination and structural damage. Indirect impacts may also arise from changes in the local water regime, organic matter content, soil biodiversity and soil process”</i> .	A preliminary assessment of the potential direct and indirect impacts of the MHPGC Project in relation to soil resources, including in relation to physical loss of, and damage to, soil resources and structural damage is set out within Section 9.8 . Potential impacts in relation to land contamination are set out within Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PEIR .
Paragraph 5.11.11 of EN-1 states that <i>“During any pre-application discussions with the applicant the LPA should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.”</i>	Consultation is a key component of the DCO application process. Consultation to date in relation to agriculture and soils is outlined Error! Reference source not found. in Section 9.3 of this chapter.
Paragraph 5.11.12 of EN-1 states that <i>“Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5).”</i>	The MHPGC Project has sought to reduce the potential impacts to best and most versatile agricultural land and soils, as part of the iterative design process as detailed in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives The baseline in relation to the agricultural land classification of soils within the Agriculture and Soils Study Area is outlined within Section 9.4 of this chapter. A preliminary assessment of the likely significant effects on agricultural land, including that considered best and most versatile (BMV), is set out within Section 9.8 of this chapter. The measures adopted to minimise impacts on soil quality are set out in Section 9.7 of this chapter.

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 5.11.13 of EN-1 outlines that <i>“Applicants should also identify any effects and seek to minimise impacts on soil health and protect and improve soil quality taking into account any mitigation measures proposed.”</i>	The baseline in relation to soils within the Agriculture and Soils Study Area is outlined within Section 9.4 of this chapter. Measures adopted as part of the MHPGC Project to avoid, manage and mitigate impacts on soils within the Agriculture and Soils Study Area are outlined within Section 9.7 and are taken into account within the preliminary assessment of the likely significant effects on soils is outlined within Section 9.8 of this chapter.
Paragraph 5.11.14 of EN-1 states that <i>“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.”</i>	Commitments adopted as part of the MHPGC Project to avoid, manage and mitigate impacts on soils within the Agriculture and Soils Study Area are outlined within Section 9.7 of this chapter. This includes the implementation of measures set out within an Outline Soil Management Plan (SMP) to be submitted with the DCO Application (CoT40). Detailed Soil Management Plan(s) will be prepared post consent in accordance with the Outline Soil Management Plan.
Paragraph 5.11.34 of EN-1 states that, in deciding an application for an order granting development consent, the SoS should <i>“ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Where schemes are to be sited on best and most versatile agricultural land the Secretary of State should take into account the economic and other benefits of that land. Where development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality”</i> .	Further details on scheme siting are provided in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives. BMV land identified in relation to the Agriculture and Soils Study Area is outlined within Section 9.4 of this chapter. The maximum design scenario, detailed in Section 9.6 has been applied in the assessment to determine potential impacts on BMV land associated with the construction, O&M, and decommissioning of the MHPGC Project. Limited site-specific Agricultural Land Classification (ALC) survey information is currently available for the MHPGC Project. Based mainly on predictive (regional scale) ALC mapping, the MHPGC PEIR Red Line Boundary: Onshore is predominately BMV (76.6%), and mainly subgrade 3a (61.5%).

Summary of relevant NPS provisions	How and where considered in the PEIR
NPS EN-5	
The Secretary of State should consider: <i>“The potentially very disruptive effects of undergrounding on ... habitats, archaeological and heritage assets, ...soil (including peat soils), hydrology, geology... (Undergrounding an overhead line will mean digging a trench along the length of the route, and so such works will often be more disruptive – albeit temporarily – to the receptors listed above than would an overhead line of equivalent rating)”</i>; The applicant’s commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils (including peat soils), particularly regarding Best and Most Versatile land, including development and implementation of a Soil Resources and Management Plan. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code of Practice for Sustainable Use of Soils on Construction Sites. (paragraph 2.9.26)	The MHPGC Project avoids peat. Measures adopted as part of the MHPGC Project to avoid, manage and mitigate impacts on soils within the Agriculture and Soils Study Area are outlined within Section 9.7 of this chapter. This includes ALC survey of agricultural land where no previous ALC survey data exists, and implementation of measures set out within an Outline Soils Management Plan (SMP) to be submitted with the DCO Application. Detailed Soil Management Plan(s) will be prepared post consent in accordance with the Outline Soil Management Plan.

National Planning Policy Framework

- 9.2.3.2 The National Planning Policy Framework (NPPF) is important and relevant to the Secretary of State (SoS) consideration of the MHPGC Project (Department for Levelling Up, Housing and Communities, 2026). **Table 9.2** provides details of the elements of the NPPF that are relevant to agriculture and soils and how and where they are covered in the PEIR or will be covered within the ES.

Table 9.2 Summary of NPPF requirements relevant to agriculture and soils

NPPF section	How and where this is considered in the PEIR
Policy 11: Making effective use of land Paragraph 187 states decisions should contribute to and enhance the natural and local environment by: f) <i>“remediating and mitigating despoiled, degraded, derelict, contaminated or unstable land, where appropriate”</i>.	The MHPGC Project includes consideration of a brownfield site for the LSS (Green LSS Option Area) which may require remediation, and which, if suitable for development will enable the MHPGC Project to comply with the NPPF and the soil hierarchy (SocEnv, 2026) by avoiding development on agricultural land and soils as detailed in Section 9.8 Historical land uses that may have impacted on land quality including soils, are detailed in Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PIER.

NPPF section	How and where this is considered in the PEIR
Policy 15: Conserving and enhancing the natural environment Paragraph 187 of the NPPF states that <i>“Planning policies and decisions should contribute to and enhance the natural and local environment by:</i> a) <i>protecting and enhancing valued landscapes, sites of ... geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);</i> b) <i>recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; ...”</i> Best and most versatile agricultural land is defined within the NPPF Annex 2: Glossary as “Land in grades 1, 2 and 3a of the Agricultural Land Classification”.	The MHPGC Project is seeking to reduce the potential impacts on BMV agricultural land and soils, as part of the iterative design process and through the application of embedded mitigation, including ALC survey to confirm the ALC grades and soil resources present within the MHPGC PEIR Red Line Boundary: Onshore to inform an Outline Soil Management Plan, as set out within Section 9.7. Available ALC survey data for the PEIR assessment is presented in Section 9.4 confirms land of Grade 2, 3a and 3b within the MHPGC Project. Predictive ALC mapping indicates that 76.6% of the MHPGC PEIR Red Line Boundary: Onshore is BMV land, however this map is at a regional scale. Consideration of buried archaeological features which rely on soils for their conservation is in Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage, of the PIER. Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PIER identifies the terrestrial ecology features within the MHPGC PEIR Red Line Boundary: Onshore that may be impacted by the MHPGC Project, including land with conservation designations, also established trees and hedgerows. These features interact with and depend upon the soils below, therefore measures to avoid or mitigate impacts on these receptors can also protect the associated soil resources and functions. By undergrounding the onshore export cables and AC connection cables, the MHPGC Project limits permanent land take to the relatively small areas required for the transition joint bays, link boxes and joint bays along the cable routes, together with the footprint of the preferred LSS Option. . Through measures in accordance with an Outline Soil Management Plan, soils would be restored to enable the land to return to the baseline condition and land use as far as reasonably practicable. All topsoil and all or most excavated subsoil can likely be reinstated over cables during construction, enabling the baseline soil functions to be restored to limit degradation of agricultural land quality. with further details to be provided in an Outline Soil Management Plan and subsequent Detailed Soil Management Plans (CoT40).

9.2.4 Local policy context

9.2.4.1 The MHPGC Project lies within the jurisdiction of Durham County Council. The following local policy that is relevant to agriculture and soils and has informed the assessment of preliminary effects in this chapter, their relevance to the MHPGC Project is outlined in **Table 9.3**:

- County Durham Plan (Durham County Council, 2020).

Table 9.3: Local policy relevant to agriculture and soils

Policy description	How and where considered in the PEIR
Durham County Council: County Durham Plan (adopted October 2020)	
Policy 14: Best and Most Versatile Agricultural Land and Soil Resource Policy 14 of the County Durham Plan seeks to conserve and protect best and most versatile agricultural land and associated soil resources, recognising their importance for ecosystem services and food production. Development of best and most versatile agricultural land will be permitted where demonstrated that the benefits of the development outweigh potential harm, accounting for economic and other benefits. Development relating to previously undeveloped land must demonstrate that soil resources would be managed and converted in a viable condition and used sustainably in line with accepted best practice.	The MHPGC Project has sought to reduce the potential impacts to BMV agricultural land and soils, as part of the iterative design process as detailed in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives and through an Outline Soil Management Plan (CoT40), as set out within Section 9.7. Where practicable, the design of the MHPGC Project will seek to avoid sensitive environmental receptors (CoT17 as set out within Section 9.7). Available ALC survey data for the PEIR assessment is presented in Section 9.4.5 and confirms land of Grade 2, 3a and 3b within the MHPGC Project. Through measures in accordance with an Outline Soil Management Plan (CoT40), land would be reinstated to previous condition and land use as far as reasonably practicable. All topsoil and all or most excavated subsoil can likely be reinstated over cables during construction, enabling the baseline soil functions to be restored.

9.3 Consultation and engagement

9.3.1 Scoping

- 9.3.1.1 A Scoping Report for the MHPGC Project was issued to the PINS and Marine Directorate – Licencing Operations Team (MD-LOT) in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, **PINS** (on behalf of the SoS) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 9.3.1.2 **Table 9.4** sets out the key comments raised during the scoping process specific to agriculture and soils, with details of how **these** comments have been addressed within the PEIR.

Table 9.4: Summary of scoping responses relevant to agriculture and soils

Comment	How and where considered in the PEIR
PINS	
ID4.9.1: The Scoping Report proposes to scope out an assessment of permanent loss of agricultural land and soil due to soil removal or soil sealing due to land use change to buildings or hard surfacing (e.g. concrete, paving slabs, tarmac etc.) during the operation and decommissioning phases. This matter is scoped in for construction on the basis that where the removal of naturally occurring soil or soil sealing takes place, it is considered to be a permanent effect which would occur during construction. Given the nature of the proposed development and the information provided within the Scoping Report, the Inspectorate agrees to scope this matter out of assessment for operation and decommissioning.	A preliminary assessment in relation to permanent loss of agricultural land and soil due to soil removal or soil sealing due to land use change to buildings or hard surfacing (e.g. concrete, paving slabs, tarmac etc.) as a result of the construction phase is detailed within Section 9.8, of this chapter. As proposed in the MHPGC Project Scoping Report, effects in relation to permanent loss of agricultural land and soil due to soil removal or soil sealing due to land use change to buildings or hard surfacing as a result of the O&M or decommissioning phases have been scoped out, as detailed in Table 9.14.
ID4.8.4: The Scoping Report proposes to scope out an assessment of soil damage and damage to agricultural land from use of construction vehicles, materials and equipment laydown and storage, handling and stockpiling of soils during the operation phase on the basis that this effect is likely to occur during construction and decommissioning. Given the nature of the proposed development and the information provided within the Scoping Report, the Inspectorate agrees to scope this matter out for operation and decommissioning.	A preliminary assessment in relation to soil damage and damage to agricultural land from use of construction vehicles, materials and equipment laydown and storage, handling and stockpiling of soils as a result of the construction and decommissioning phases is detailed within Section 9.8 of this chapter. As proposed in the MHPGC Project Scoping Report, effects in relation to soil damage and damage to agricultural land from use of construction vehicles, materials and equipment laydown and storage, handling and stockpiling of soils as a result of the O&M phase have been scoped out, as detailed in Table 9.14.
ID4.8.5: The Scoping Report proposes to scope out an assessment of soil degradation and damage to agricultural land during the operation phase on the basis that soil disturbance, vegetation stripping, excavation and stockpiling of soils will only take place during the construction and decommissioning phases. Given the nature of the proposed development and the information provided within the Scoping Report, the Inspectorate agrees to scope this matter out for operation.	A preliminary assessment in relation to soil damage and damage to agricultural land from use of construction vehicles, materials and equipment laydown and storage, handling and stockpiling of soils as a result of the construction and decommissioning phases is detailed within Section 9.8 of this chapter. As proposed in the MHPGC Project Scoping Report, effects in relation to soil damage and damage to agricultural land from soil disturbance, vegetation stripping, excavation and stockpiling of soils as a result of the O&M phase have been scoped out, as detailed in Table 9.14.

Comment	How and where considered in the PEIR
ID4.8.6: The Scoping Report proposes to scope out an assessment of degradation of topsoil due to mixing with subsoil, or contamination with other materials resulting in soil degradation and damage to agricultural land during the operation phase on the basis that this effect is likely to result from soil excavation, storage in stockpiles and handling which are only anticipated during the construction and decommissioning phases. Given the nature of the proposed development and the information provided within the Scoping Report, the Inspectorate agrees to scope this matter out for operation and decommissioning.	A preliminary assessment in relation to degradation of topsoil due to mixing with subsoil, or contamination with other materials resulting in soil degradation and damage to agricultural land as a result of the construction phase is detailed within Section 9.8 of this chapter. As proposed in the MHPGC Project Scoping Report, effects in relation to the degradation of topsoil due to mixing with subsoil, or contamination with other materials resulting in soil degradation and damage to agricultural land as a result of the O&M or decommissioning phases have been scoped out, as detailed in Table 9.14.
ID4.8.7: The Scoping Report proposes to scope out an assessment of damage to existing land drainage during the operational phase on the basis that this impact is likely to arise from ground excavation and use of plant during ground works during the construction and decommissioning phases. Given the nature of the proposed development and the information provided within the Scoping Report, the Inspectorate agrees to scope this matter out for operation.	A preliminary assessment in relation to damage to existing land drainage as a result of the construction and decommissioning phases is detailed within Section 9.8 of this chapter. As proposed in the MHPGC Project Scoping Report, effects in relation to damage to existing land drainage as a result of the O&M phase have been scoped out, as explained in Table 9.14.
ID4.8.8: The Scoping Report proposes to scope out loss of soils or agricultural land during the operation and maintenance and decommissioning phases given any loss of agricultural land will occur during the construction phase. Where there would be no further permanent losses during operational and maintenance or decommissioning activities that would result in likely significant effects on agricultural land, including Best Most Versatile (BMV), the Inspectorate is content that this matter can be scoped out of the impact assessment. However, the ES should clearly describe the assumptions made in respect of decommissioning and potential effects on agricultural land and make clear of the reasonings for the conclusions reached.	A preliminary assessment in relation to the loss of soils or agricultural land as a result of the construction phase is detailed within Section 9.8 of this chapter. Assumptions made in regards to decommissioning are detailed in Volume 1, Chapter 2: Project Description with potential effects during decommissioning considered in Section 9.8.4.
The ES should contain a clear tabulation of the areas of land in each BMV classification to be temporarily or permanently lost as a result of the proposed development, with reference to accompanying map(s) depicting the grades. Specific justification for the use of the land by grade should be provided. The applicant's attention is drawn to the comments from Natural England at appendix 2 of this Scoping Opinion. Consideration should be given to the use of BMV land in the applicant's discussion of alternatives.	For the purposes of the preliminary assessment, a summary of the baseline in relation to soils and agricultural land classification has been provided based on a desk-based review (as outlined within Section 9.4 of this chapter), to inform the preliminary assessment of temporarily and permanently lost land in Section 9.8 and updated within the ES, as required. . A response to the comments raised by Natural England regarding BMV soils can be found below within this table. Available ALC information is presented in Table 9.7 BMV agricultural land was factored into an iterative site selection process as part of the consideration of alternatives. Further detail is outlined within Volume 1, Chapter 3: Site Selection & Consideration of Alternatives, of the PEIR.

Comment	How and where considered in the PEIR
Natural England	
Soils are a valuable, finite natural resource and should also be considered for the ecosystem services they provide, including for food production, water storage and flood mitigation, as a carbon store, reservoir of biodiversity and buffer against pollution. It is therefore important that the soil resources are protected and sustainably managed. Impacts from the development on soils and best and most versatile (BMV) agricultural land should be considered. Further information is contained in the Guide to assessing development proposals on agricultural land. The following issues should be considered and, where appropriate, included as part of the ES: • The degree to which soils would be disturbed or damaged as part of the development. • The extent to which agricultural land would be disturbed or lost as part of this development, including whether any BMV agricultural land would be impacted.	The assessment in Section 9.8 considers the potential impacts of the MHPGC Project on soils and BMV agricultural land. The impacts scoped in for assessment are outlined in Section 9.6 and include the loss of soil resources and soil functions and the loss of BMV agricultural land due to land use change to hard development (buildings, roads, etc) and the potential damage to and loss of soil resource due to temporary disturbance to and handling of soils for construction or decommissioning. Consideration has been given to the Guide to assessing development proposals on agricultural land in particular the commitment to undertake ALC surveys and commitments regarding the management and protection of soils detailed in Table 9.16.
This may require a detailed Agricultural Land Classification (ALC) survey if one is not already available. For information on the availability of existing ALC information see www.magic.gov.uk. Where an ALC and soil survey of the land is required, this should normally be at a detailed level, e.g. one auger boring per hectare, (or more detailed for a small site) supported by pits dug in each main soil type to confirm the physical characteristics of the full depth of the soil resource, i.e. 9.2 metres. The survey data can inform suitable soil handling methods and appropriate reuse of the soil resource where required (e.g. agricultural reinstatement, habitat creation, landscaping, allotments and public open space).	Available baseline ALC information for the MHPGC PEIR Red Line Boundary: Onshore is reported in Section 9.4. For most of the MHPGC PEIR Red Line Boundary: Onshore, site specific ALC survey data is unavailable. ALC survey will therefore be completed to confirm the ALC grades within the MHPGC PEIR Red Line Boundary: Onshore.

Comment	How and where considered in the PEIR
The ES should set out details of how any adverse impacts on BMV agricultural land can be minimised through site design/masterplan.	Details on site design and the iterative process that was followed can be found in Volume 1, Chapter 3: Site Selection & Consideration of Alternatives and associated annex. . Commitments adopted as part of the MHPGC Project, including in relation to avoiding area of BMV agricultural land, are set out within Section 9.7 and includes the avoidance of sensitive environmental receptors, where practicable (CoT17 as set out within Section 9.7) The assessment in Section 9.8 considers the potential impacts of the MHPGC Project on soils and BMV agricultural land. The impacts scoped in for assessment are outlined in Section 9.6 and include the loss of soil resources and soil functions and the loss of BMV agricultural land due to land use change to hard development (buildings, roads, etc) and the potential damage to and loss of soil resource due to temporary disturbance to and handling of soils for construction or decommissioning.
The ES should set out details of how any adverse impacts on soils can be avoided or minimised and demonstrate how soils will be sustainably used and managed, including consideration in site design and master planning, and areas for green infrastructure or biodiversity net gain. The aim will be to minimise soil handling and maximise the sustainable use and management of the available soil to achieve successful after-uses and minimise offsite impacts.	An assessment of impacts on Agriculture and Soils is presented in Section 9.8. An Outline Soil Management Plan (SMP) will be submitted with the DCO Application (CoT40). Detailed Soil Management Plan(s) will be prepared post consent in accordance with the Outline Soil Management Plan. ALC survey is being undertaken for the MHPGC Project and information on soil resources obtained from the survey will be used to develop the Outline SMP. The Outline SMP will set out the key soil management principles, including the timing of works, to reduce the potential for adverse impacts to soils and agricultural land quality. Commitments adopted as part of the MHPGC Project, including in relation to the Outline SMP, are set out within Section 9.7.
Further information is available in the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites and The British Society of Soil Science Guidance Note Benefiting from Soil Management in Development and Construction.	The Outline SMP will include good practice measures for soil management as set out within the Construction Code of Practice for the Sustainable Use of Soil on Development Sites (Defra, 2018) and the British Society of Soil Science (BSSS) Working with Soil Guidance Note: Benefiting from Soil Management in Development and Construction (BSSS, 2022). Commitments adopted as part of the MHPGC Project, including in relation to the Outline SMP, are set out within Section 9.7.

9.3.2 Further consultation and engagement

- 9.3.2.1 Further consultation will be sought with Natural England as to the methodology of site specific ALC surveys. ALC surveys will be undertaken to confirm the nature and ALC of soil types (identified as

part of the desk study). This will confirm the characteristics of soil profiles within each of the soil types and assist in the development of the Outline Soil Management Plan (see commitments in **Table 9.16**).

9.4 Baseline Characterisation

9.4.1 Overview

9.4.1.1 **Volume 1, Chapter 2: Project Description, of the PEIR** sets out the description of the MHPGC Project and **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information.

9.4.1.2 This section describes the methods and data sources used to characterise the baseline for agriculture and soils use within the Agriculture and Soils Study Area and describes the existing baseline characteristics.

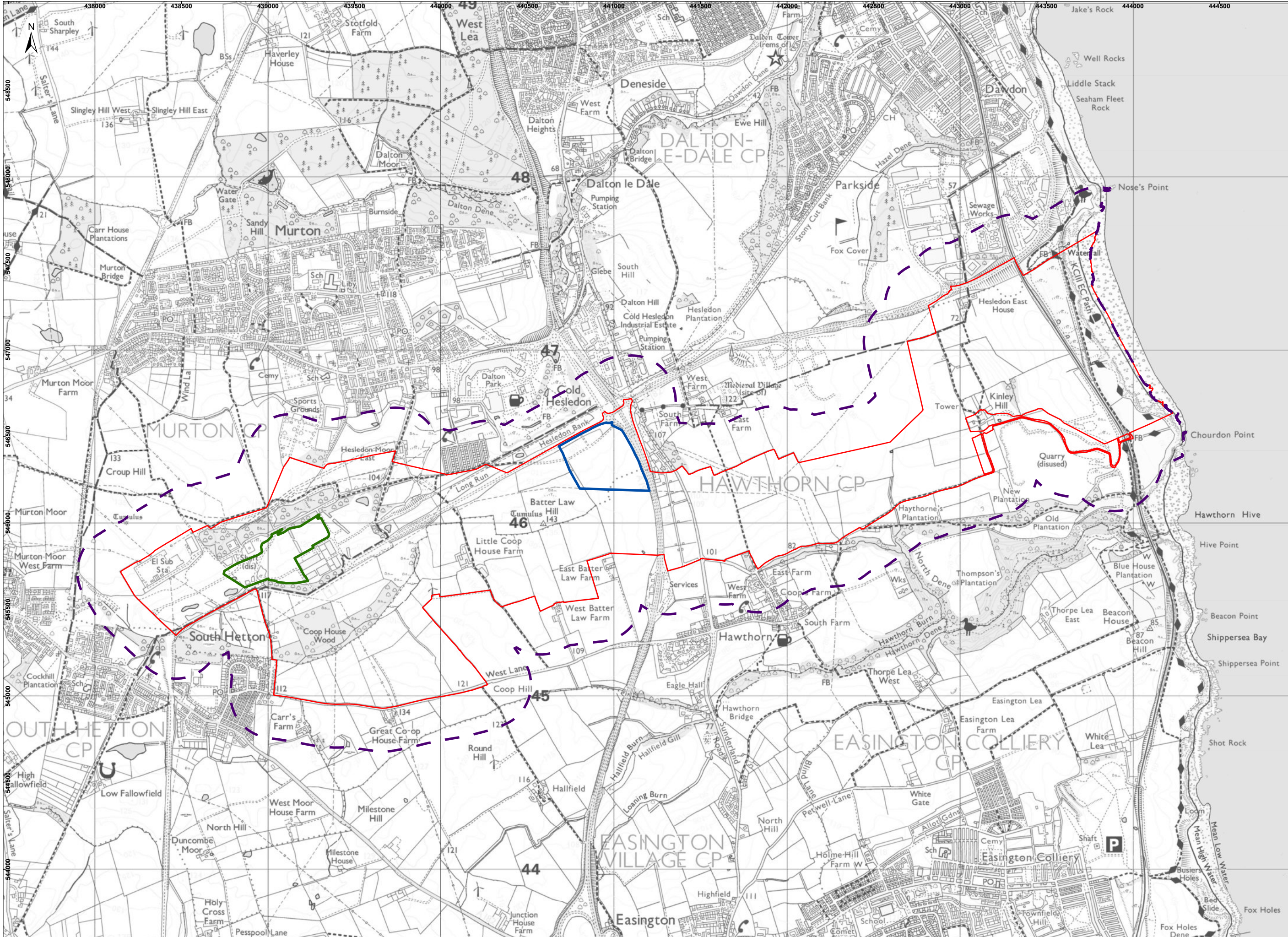
9.4.1.3 For the purposes of the assessment, agricultural land and soil baseline conditions have been considered based upon:

- Predictive ACL Map for England (Defra, 2026);
- Post 1988 ALC survey information (Natural England, 2025);
- Soil mapping (Cranfield University, 2026);
- Geology mapping (Groundsure, 2026);
- Historical land use information (Groundsure, 2026a).

9.4.2 Agriculture and Soils Study Area

9.4.2.1 The Agriculture and Soils Study Area comprises all land within the MHPGC PEIR Red Line Boundary: Onshore, landward of Mean High Water Springs (MHWS) with a 250m buffer applied. Effects on soil receptors including where these occur within BMV or lower grade agricultural land would be most likely to occur where designated features are within the MHPGC PEIR Red Line Boundary: Onshore. The 250m buffer ensures that potential impacts on adjacent/ nearby offsite receptors are also considered.

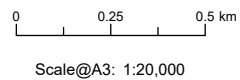
9.4.2.2 The extent of the Agriculture and Soils Study Area for the purposes of the preliminary assessment is set out within **Figure 9.1**.



- LEGEND**
- MHPGC PEIR Red Line Boundary: Onshore
 - Blue LSS Option Area
 - Green LSS Option Area
 - Agriculture and Soils Study Area (250m Buffer)

Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 9.1 AGRICULTURE AND SOILS STUDY AREA



Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
GB Background: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack
Contains public sector information licensed under the Open government License v3.0.
© Crown copyright and database rights 2026 Ordnance Survey AC0000848283

Drawing Number:
MHPGC-WSP-PEIR-LAN-027

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9.4.3 Relevant guidance

9.4.3.1 The preliminary assessment has been carried out in accordance with the following guidance documents:

- Institute of Sustainability and Environmental Professionals (ISEP), formerly Institute of Environmental Management and Assessment (IEMA) IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022);
- Planning Practice Guidance for the Natural Environment (Ministry of Housing, Communities and Local Government (MHCLG), 2025);
- Agricultural Land Classification of England and Wales: Guidelines for grading the quality of agricultural land (Defra, 2025);
- Natural England Technical Information Note 049 (TIN049): Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land (Natural England, 2019);
- Natural England Guide to Assessing Development Proposals on Agricultural Land (Natural England, 2026);
- Safeguarding our Soils: A Strategy for England (Defra, 2009) BSSS Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (BSSS, 2022);
- Institute of Quarrying (IQ) Good Practice for Handling Soils in Mineral Workings (IQ, 2021);
- CIRIA (2023) C809 Sustainable Management of Surplus Soils & Aggregates from Construction;
- Society for the Environment (SocEnv) (2026) Soil Management Hierarchy in Rural Settings;
- SocEnv (2026) Ten Principles of Good Soil and Stones Management.

9.4.4 Baseline data sources

Desk study

9.4.4.1 Baseline information in relation to the identification of agriculture and soils related receptors was collated through a detailed desk review of existing studies and datasets. These are summarised within **Table 9.5**.

Table 9.5: Agriculture and Soils data sources

Factor assessed	Source of desk study data
Land use	
Agriculture and Soils	• ALC Grades - Post 1988 (England) (Natural England, 2025); • Predictive Agricultural Land Classification Map for England (Defra, 2026); • Reserve Site at Hawthorn Pit Cokeworks: Agricultural Land Classification ALC Map and Report (Farming and Rural Conservation Agency, 1997); • Soilscales Viewer (LandIS and Cranfield University, 2025); • National Soil Map (Cranfield University, Land Information System LandIS, 2026); • England Peat Map (Natural England, 2025a); • Peaty Soils Location (England) – The Peat Layer (Natural England, 2024a).

9.4.4.2 The baseline in relation to agriculture and soils will continue to be developed as the design of the MHPGC Project is further refined.

Site specific surveys

9.4.4.3 Site-specific ALC surveys, will be completed for agricultural land within the MHPGC PEIR Red Line Boundary: Onshore. This will confirm the ALC grades present and provide details of the soil resources present to inform the Outline SMP (CoT40, **Section 9.7**).

Data limitations and assumptions

9.4.4.4 For the PEIR assessment, a combination of post 1988 ALC mapping published by Natural England and Predictive ALC mapping (Defra, 2026) has been used to establish the likely ALC grade of land

within the Agriculture and Soils Study Area. The post 1988 ALC mapping is typically sufficiently detailed to confirm the ALC grade, and this is discussed further below in **Section 9.4.5**).

- 9.4.4.5 The Predictive ALC mapping recently published by Defra (Defra, 2026) supersedes the Provisional ALC mapping (Natural England, 2019) referred to in the MHPGC Project Scoping Report. The Predictive ALC mapping has been used to classify agricultural land across the Agriculture and Soils Study Area for the PEIR assessment in **Section 9.8** where post 1988 mapping is not available.
- 9.4.4.6 The Provisional ALC map referred to in the Scoping Report did not differentiate between subgrades 3a and 3b, and only showed Grade 3, however the Predictive mapping uses a different methodology, incorporating detailed soil and climate data, and this does assign subgrades 3a and 3b. The updated methodology for classification also means that in some instances other grades will differ in extent/location compared to the Provisional ALC mapping.
- 9.4.4.7 In common with the Provisional ALC mapping, scale and resolution limitations to the Predictive ALC mapping mean that it is only intended for strategic or indicative purposes and site-specific survey is needed to confirm the ALC grades present.

9.4.5 Overview of baseline environment

- 9.4.5.1 The following section provides an overview of the baseline environment within the Agriculture and Soils Study Area.
- 9.4.5.2 The area surrounding Seaham, containing the MHPGC Red Line Boundary: Onshore, has a history of mineral extraction, including both coal and non-coal minerals. Baseline information in relation to geology, mineral resources, including mineral extraction sites and mineral safeguarding areas are outlined within **Volume 3, Chapter 1: Geology, Hydrogeology and Ground Conditions, of the PEIR**.

Agricultural land

Desktop information

- 9.4.5.3 Agriculture is the main land use within the Agriculture and Soils Study Area. Within England, agricultural land is graded in accordance with the ALC system. This ALC survey methodology has recently been updated by Defra (Defra, 2025) and applies in England and Wales, this updated guidance does not affect the conclusion of ALC surveys completed using the approach in the previous ALC guidance (Ministry of Agriculture, Fisheries and Food (MAFF), 1988).
- 9.4.5.4 The ALC system classifies land into grades according to the land capability in relation to crop yields and range, versatility of use, and the need for inputs for agriculture. The system considers characteristics of the land including gradient and climate, the soil type and thickness, and the soil's wetness and droughtiness. Grades are defined based on the presence or absence of characteristics that impose long-term limitations on agricultural use.
- 9.4.5.5 BMV land is described in NPPF as land in grades 1, 2 and 3a of the ALC system. Grade 1 is excellent quality agricultural land, Grade 2 very good quality, and Subgrade 3a good quality. Land of grades 3b, 4 and 5 is moderate to very poor agricultural land. A full description of each ALC grade is included in **Table 9.6**.

Table 9.6: Agricultural Land Classification Defra (Defra, 2025) definitions

ALC grade	MAFF definition (MAFF, 1988)
Grade 1: Excellent Quality Agricultural Land	Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.
Grade 2: Very Good Quality Agricultural Land	Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 9.

ALC grade	MAFF definition (MAFF, 1988)
Subgrade 3a: Good Quality Agricultural Land	Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Subgrade 3b: Moderate Quality Agricultural Land	Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
Grade 4: Poor Quality Agricultural Land	Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.
Grade 5: Very Poor Quality Agricultural Land	Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

- 9.4.5.6 Predictive ALC mapping (Defra, 2026) is available for all areas of England and this shows most agricultural land within the MHPGC PEIR Red Line Boundary: Onshore as subgrade 3a (BMV). A large area of Grade 2 (BMV) is also shown in the central and eastern area (Figure 9.2). As outlined in **Section 9.4.4** the predictive ALC mapping, published at 1:250,000 scale, is intended for strategic, not site-specific use. It is not suitable for confirming the ALC grades present on proposed development sites however, it provides an indication of the regional coverage of each grade.
- 9.4.5.7 Natural England also publishes previous ALC survey data at a detailed scale as the 'Post 1988 ALC map' (Natural England, 2023). In most instances, this data is suitable to confirm the site-specific ALC grades and, where available, it therefore supersedes the indicative grading shown on the predictive ALC map.
- 9.4.5.8 Where post 1988 ALC survey is available for the MHPGC PEIR Red Line Boundary: Onshore, this has confirmed areas of Grade 2 and Subgrade 3a (BMV land) and Subgrade 3b (not BMV land) and 'other' (non-agricultural) land, as follows:
- Land in the east of the MHPGC PEIR Red Line Boundary: Onshore, west of the landfall, falls partly within an area of post 1988 ALC survey for 'Land South Of Dawdon Link Road' (Natural England, 2016). The onsite survey area covers 16.3 hectares (ha), 14.0 ha of which was confirmed to be subgrade 3a (BMV), and 2.3 ha subgrade 3b.
 - Land in the west of the MHPGC PEIR Red Line Boundary: Onshore falls partly falls within an area of post 1988 ALC mapping. The onsite survey covers 61.6 ha of land, including most of the footprint of the Green LSS Option Area. Of the total survey area, 40.9 ha is in previously developed area (brownfield), associated with the former Hawthorn Mine and Jade Business Park. Within the Green LSS Option Area 10 ha of land is included in the survey report and mapped as 'other' land. This land and the remaining 9.2 ha of the Green LSS Option not included in the survey would be classed as 'urban' land by any future ALC survey, in accordance with the current ALC grading guidelines (Defra, 2025), reflecting that the land has been previously developed (brownfield). In the surrounding fields to the north and south, the survey found 4.3 ha of Grade 2 and 2.8ha of subgrade 3a (7.1 ha of BMV land), and 13.7 ha of subgrade 3b. The ALC report detailing this survey is not published by Natural England and has therefore not been available to review. The grade 2 land was all located to the north of the Green LSS Option Area.
- 9.4.5.9 The post 1988 ALC survey data and historical mapping (Groundsure, 2026a) reviewed for the Green LSS Option confirms that it is entirely within previously developed brownfield land.
- 9.4.5.10 **Section 9.1** provides a summary of the ALC grades in terms of area in hectares and percentage split, using the post 1988 ALC grades and the predictive ALC grades where detailed survey is not available. Predictive ALC mapping and post 1988 ALC survey results within the Agriculture and Soils Study Area are set out in **Figure 9.2**.

Table 9.7: Approximate ALC grade split and percentage per MHPGC Project component

ALC grade	Green LSS Option Area		Blue LSS Option Area		MHPGC PEIR Red Line Boundary: Onshore excluding LSS Option Areas	Total MHPGC PEIR Red Line Boundary: Onshore including LSS Option Areas		
	ha	%	ha	%		ha	%	ha**
1	-	-	-	-	-	-	-	-
2	-	-	-	-	71.3	17.0%	71.3 (central and eastern areas)	15.1%
3a	-	-	13.7	100%	276.5	69.4%	290.2	61.5%
3b	-	-	-	-	26.7	2.7%	26.7	5.7%
4	-	-	-	-	6.5	9.7%	6.5	9.4%
5	-	-	-	-	8.8	2.2%	8.8	9.9%
Other*	10	89.3%	-	-	54.6	6.0%	64.6	13.7%
Urban	9.2	10.7%	-	-	2.6	9.0%	3.8	0.8%
dBMV (Grades 1, 2 and 3a)	-	-	13.7	100%	347.8	77.8%	361.5	76.6%

*Examples of 'other' land categories used on ALC maps include: non-agricultural (e.g., 'soft' land uses where land could be returned to agricultural, such as golf courses, private parkland, public open space), woodland, open water, and agricultural buildings, also land not surveyed.

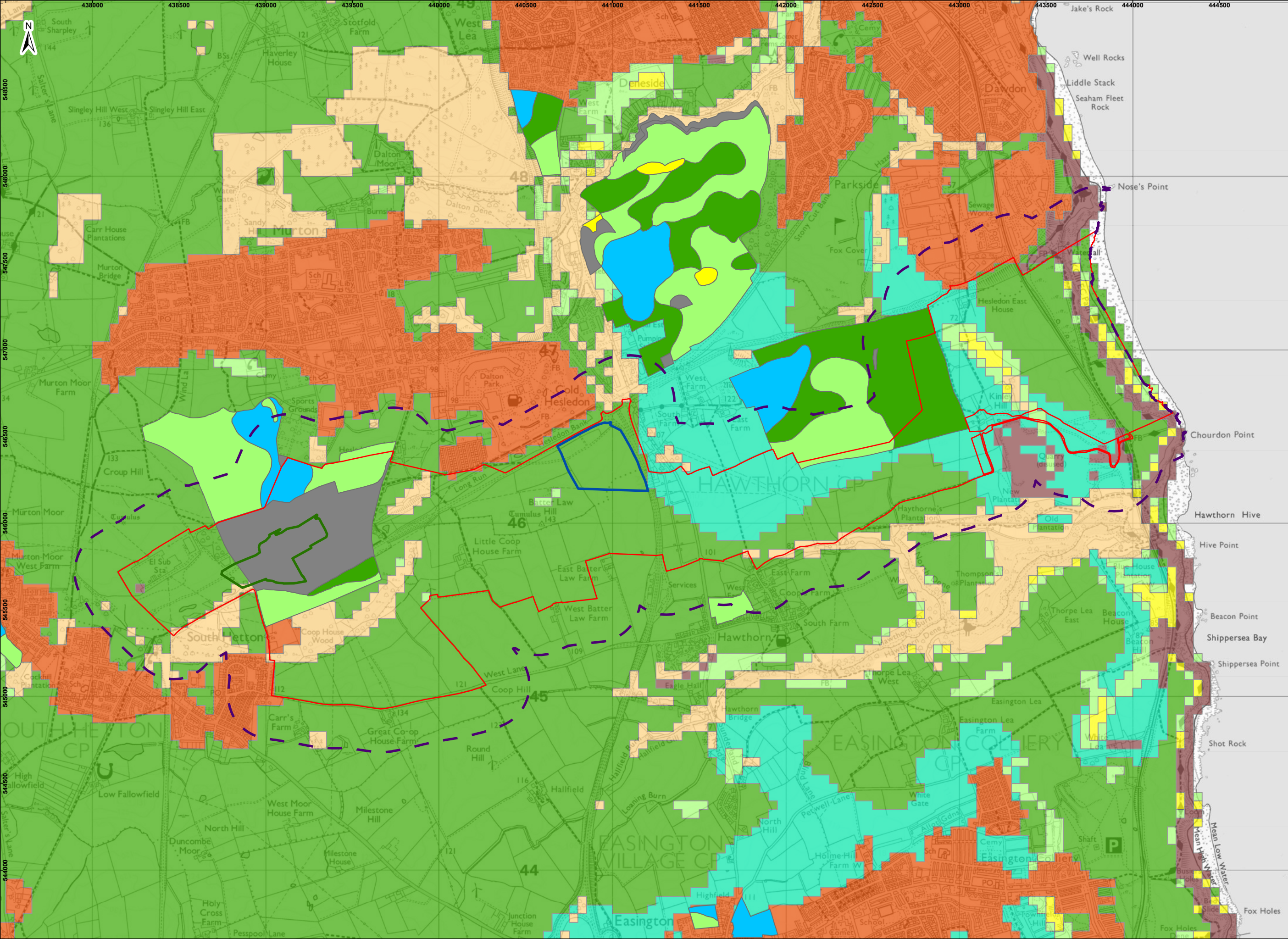
**Due to the map scale of the predictive ALC mapping, the total area in Table 9.7 does not align exactly with the MHPGC PEIR Red Line Boundary: Onshore, however the total areas of each ALC grade are only approximate until they can be updated with site-specific survey data. Site specific survey will be completed on the MHPGC PEIR Red Line Boundary: Onshore, the results of which will be reported in the ES.

- 9.4.5.11 Based on **Table 9.7**, for the MHPGC PEIR Red Line Boundary: Onshore as a whole, 76.6% of the land is shown as BMV, comprising of subgrade 3a (61.5% of the total area) and grade 2 (15.1% of the total area). No grade 1 has been identified to date. The remaining land is shown as subgrade 3b (5.7%), grade 4 (9.4%), grade 5 (9.9%), and other or urban land use (14.5%).
- 9.4.5.12 The lower grade land shown on the predictive ALC map is located near the coast, mainly east of the railway line in the east of the MHPGC Project PEIR Red Line Boundary: Onshore. This is likely associated with slopes and thinner soils towards the cliff edge. This land will largely be avoided by the MHPGC Project due to the trenchless techniques proposed at landfall. For the purpose of the preliminary assessment, it is therefore assumed that all land proposed for development is BMV land. Predictive ALC mapping within the Agriculture and Soils Study Area is set out within **Figure 9.2**.
- 9.4.5.13 To provide regional context, County Durham covers an area of approximately 223,089.8 ha of which 206,176.3 ha (92.42%) is classed as agricultural land. Predictive ALC mapping in **Table 9.8** shows that most agricultural land in County Durham is classed as Grade 3 (38.20%), followed by Grade 5 (32.60%) and Grade 4 (20.01%).
- 9.4.5.14 The prominence of Grade 4 and Grade 5 land (47.2% of all agricultural land in the region) is due to the presence of upland landscapes, notably the Pennines, occupying much of the west of County Durham. Small areas of Grade 2 land (5.17% of all agricultural land) are present in eastern areas of County Durham, tending to be associated with river valleys. Areas of non-agricultural land are also present, the largest of which can be attributed to large scale forestry plantations. A total of 34,886.9ha (18.74%) of agricultural land within County Durham is predicted to be of BMV quality. Subgrade 3b is the most common ALC grade in the region, estimated at 34.05% of all agricultural land, followed by Grade 5 (33.91%).

Table 9.8: Predictive ALC grading across County Durham

ALC grade	Area (ha)	Percentage of land area (%)	Percentage of agricultural land area (%)*
Grade 1	63.3	0.03%	0.03%
Grade 2	9,630.9	4.32%	5.17%
Subgrade 3a	25,192.7	11.29%	13.53%
Subgrade 3b	63,390.5	28.41%	34.05%
Grade 4	24,770.5	11.10%	13.30%
Grade 5	63,136.2	28.30%	33.91%
Non-Agricultural	21,709.0	9.73%	-
Urban	15,199.7	6.81%	-
Total	223,093	100%	100%
Total BMV	34,886.9	15.64%	18.74%

*Excludes land classified by provisional ALC mapping as non-agricultural or urban



LEGEND

MHPGC PEIR Red Line Boundary: Onshore

Blue LSS Option Area

Green LSS Option Area

Agriculture and Soils Study Area (250m Buffer)

Post 1988 ALC Grade

Grade 2

Grade 3a

Grade 3b

Grade 4

Other

Predictive ALC Grade

Grade 1

Grade 2

Grade 3a

Grade 3b

Grade 4

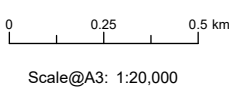
Grade 5

Non agricultural

Urban

Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 9.2 AGRICULTURAL LAND CLASSIFICATION

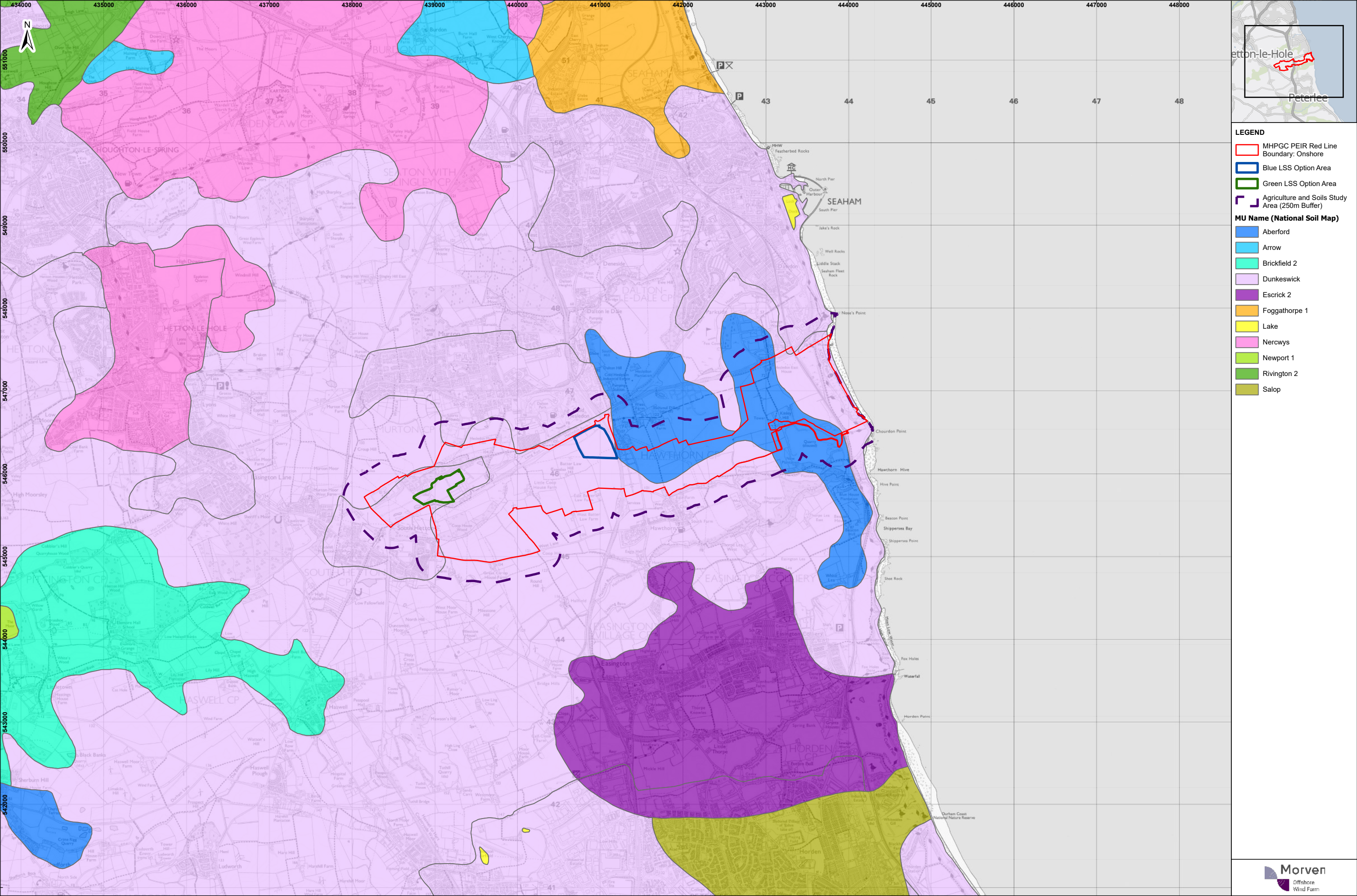


Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid

Data Sources:
BP, Ordnance Survey, DEFRA

Service Layer Credits:
GB Background: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack
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LEGEND

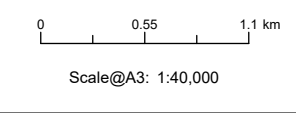
- MHPGC PEIR Red Line Boundary: Onshore
- Blue LSS Option Area
- Green LSS Option Area
- Agriculture and Soils Study Area (250m Buffer)

MU Name (National Soil Map)

- Aberford
- Arrow
- Brickfield 2
- Dunkeswick
- Escrick 2
- Foggathorpe 1
- Lake
- Nercwys
- Newport 1
- Rivington 2
- Salop

Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
FIGURE 9.3 NATIONAL SOIL MAP



Geodetic Information:
Datum: OSGB 1936
Projection: British National Grid

Data Sources:
BP, Ordnance Survey, Cranfield University, DEFRA

Service Layer Credits:
GB Background: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack
Contains public sector information licensed under the Open government License v3.0.
Contains LandIS data © Cranfield University and Defra 2026
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Drawing Number:
MHPGC-WSP-PEIR-LAN-029

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MHPGC PEIR Red Line Boundary: Onshore Soils

- 9.4.5.15 LandIS Soilscales and the National Soil Map (Cranfield University, 2026) show the MHPGC PEIR Red Line Boundary: Onshore and the MHPGG Agriculture and Soils Study Area covered by two different soil types.
- 9.4.5.16 Across most of the MHPGC PEIR Red Line Boundary: Onshore, the National Soil map shows the Duneswick (0711p) soil association, comprising of seasonally wet deep loam to clay.
- 9.4.5.17 In some of the eastern parts of the MHPGC Project Agriculture and Soils Study Area the Aberford (0511a) soil association is shown. These soils comprise loam over limestone. Further description of each soil type is below. The National Soil Map (Cranfield University, 2026) for the Agriculture and Soils Study Area is presented in **Figure 9.3**.
- 9.4.5.18 LandIS Soilscales (Cranfield University, 2026) is a simplified version of the National Soil Map and provides summary soil information including details in relation to landcover and habitats associated with the soils, drainage, fertility and carbon storage. This mapping describes the Duneswick (0711p) soils as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils with impeded drainage. Drainage is to stream networks. Carbon storage potential is low. The main risks in relation to water protection for this soil type are associated with overland flow from compacted or poached fields, as well as organic slurry dirty water, fertiliser, pathogens and fine sediment can all move in suspension or solution with overland flow or drain water. In terms of cropping, this soil type is mostly suited to grass production for dairying or beef or for cereal production, often for feed. For cropping, the timeliness of stocking and fieldwork for this soil type is important and wet ground conditions are typically to be avoided at the beginning and end of the growing season to avoid damage to soil structure.
- 9.4.5.19 LandIS Soilscales mapping describes the Aberford (0511a) soils as freely draining lime-rich loamy soils, with typical land cover of arable land or grassland at higher altitude. Drainage is to chalk or limestone groundwater. Carbon storage potential is low. The main risks in relation to water protection for this soil type are its vulnerability to leaching of nitrate to groundwater and that surface capping and erosion of chalk soils under cereals can be linked with nutrient enrichment and silting of chalk streams and their gravel spawning beds. For cropping, this soil type is well suited to spring and autumn-sown cereals and other crops including grass, though can be typically nitrate vulnerable.
- 9.4.5.20 No peat soils are recorded within the MHPGC PEIR Red Line Boundary: Onshore or the Agriculture and Soils Study Area on the National Soil Map (Cranfield University, Land Information System LandIS, 2026).
- 9.4.5.21 Peat mapping for England was consulted, including the older peaty soils mapping (Natural England, 2024a) and the new peat map for England (Natural England, 2026a). The new map is known to have limitations in the extent of lowland peat it shows, this is due to survey data being harder to gather and due to expanses of peat having been modified by historical agricultural use. Both maps show no areas of peat within the MHPGC PEIR Red Line Boundary: Onshore or the Agriculture and Soils Study Area.
- 9.4.5.22 No peat soils were identified during habitat surveys completed as part of the baseline characterisation to inform the preliminary assessment of terrestrial ecology (as set out in **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**). On this basis, no peat is expected to be present within the MHPGC PEIR Red Line Boundary: Onshore within the maximum excavation depths of onshore components.
- 9.4.5.23 Soils data is included as part of a 1997 'Reserve Site at Hawthorn Cokeworks' ALC survey (Farming and Rural Conservation Agency, 1997). The survey found the soils to be of a medium clay loam to medium sandy loam topsoil over sandy clay loam to lay subsoils, they were imperfectly drained, with characteristics of gleying in the subsoil, characteristic of the Duneswick association.

9.4.6 Future baseline conditions

- 9.4.6.1 During the 35-year operational lifetime of the MHPGC Project, the Agriculture and Soils baseline can be expected to evolve both on a natural basis and in response to global trends such as climate change and other anthropogenic activities. The Infrastructure Planning (EIA) Regulations 2017 require that "an outline of the likely evolution thereof without implementation of the development as

far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge" is included. Therefore, an assessment of future baseline conditions, in the absence of the MHPGC Project, has been undertaken and is described within this section.

- 9.4.6.2 In the absence of the MHPGC Project, it is expected that land uses within the MHPGC PEIR Red Line Boundary: Onshore and Agriculture and Soils Study Area would remain broadly similar to the baseline, i.e., mainly agricultural. However further urban expansion of residential and commercial developments, and further renewable energy or battery storage projects, are likely to occur, based on planning applications reviewed for the CEA in **Section 9.9**.
- 9.4.6.3 Changes to agricultural policy in England are possible and could impact on agricultural land use, and in turn soil health (e.g., actions such as moving away from intensive farming to regenerative agricultural to promote biodiversity and reduce chemical inputs is likely to improve soil health).
- 9.4.6.4 The likely increases in the frequency and severity of severe weather events due to climate change will increase financial risks for farm businesses and could mean that farming activities rapidly cease or change, which would also affect agriculture and soils, and potentially result in rapid changes of land use from agriculture to other land uses. The National Biodiversity Climate Change Vulnerability Model (NBCCVM) was created to provide a spatial assessment of the relative vulnerability of priority habitats, of which soils form a part, based on established climate change adaptation principles. The MAGIC interactive map shows a medium priority Climate Change Vulnerability Zone in the east of the MHPGC PEIR Red Line Boundary: Onshore and Agriculture and Soils Study Area, including the landfall, and a low priority Climate Change Vulnerability Zone west of this extending approximately to the A19. These are areas assessed to be at medium or low vulnerability to climate change, based on established climate change adaptation principles.

9.5 Impact assessment methodology

9.5.1 Overview

- 9.5.1.1 **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the preliminary agriculture and soils assessment. The methodologies for assessing sensitivity, magnitude and significance for agriculture and soils are described in more detail below.
- 9.5.1.2 The approach to the assessment is consistent with the methodology set out in the ISEP land and soils in EIA guidance (ISEP, 2022). This uses a soil function approach to define receptor sensitivity, which is designed to take account of key soil functions and ecosystem services, including as a growing medium for crops, as a store of organic matter including carbon, nutrient cycling, providing habitat and being a key part of terrestrial biodiversity, and soil's role in the hydrological cycle. For soils in BMV agricultural land, the ALC grade is often the main criteria resulting in high sensitivity to development due to the versatility of these soils for growing crops and biomass.
- 9.5.1.3 Impact magnitude is assigned based on the extent of agriculture and soils that may be directly affected by the MHPGC Project and whether the effects would be permanent or temporary. This area-based approach reflects that fact that soils take such a long time to form that they are effectively non-renewable natural resources, and that permanent or temporary changes in land use can have very rapid and severe and long-lasting or permanent impacts on soils. It also reflects the fact that soils are geographically specific, being the product of the geological, topographical, ecological, hydrological, hydrogeological, and climatic conditions in which they develop.

9.5.2 Receptor sensitivity

- 9.5.2.1 The criteria to determine receptor sensitivity is presented in **Table 9.9**, in general accordance with the ISEP land and soils in EIA guidance (ISEP, 2022).
- 9.5.2.2 There are interactions between soil receptors and other receptors considered in the PEIR. Chapters dealing with receptors that depend heavily on soils include: **Volume 3, Chapter 1: Geology**,

Hydrogeology and Ground Conditions, of the PEIR (soil health can be affected by contaminants and contaminated soils can impact on land contamination receptors, notably human health, flora and fauna); **Volume 3, Chapter 2: Water Resources and Flood Risk, of the PEIR** (well-structured and heathy soils can filter and store water, reducing flood risk) ; **Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**; and, **Volume 3, Chapter 4: Onshore Archaeology and Cultural Heritage, of the PEIR** (e.g., soils can function to protect and conserve archaeological features).

Table 9.9: Definition of terms relating to the sensitivity of the receptor

Sensitivity	Definition
Very high	Soils in Grade 1 and 2 ALC agricultural land. Soils directly supporting a European Union (EU) designated site (e.g. SAC, SPA, Ramsar). Soil carbon: Peat soils, peatlands - blanket bog, raised bog, fen peat soils (mapped peatland and peatland with any statutory designation including SSSI).
High	Soils in Grade 3a ALC agricultural land. Soils (other than peat) directly supporting a UK designated site (e.g. SSSI, Local Nature Reserve (LNR)). Soils supporting protected features within a UK designated site (e.g. United Nations Educational, Scientific and Cultural Organization (UNESCO) Geoparks, SSSI or Area of Outstanding Natural Beauty (AONB), Special Landscape Area); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UK Biodiversity Action Plan (BAP) Priority habitats). Soil carbon: Organo-mineral soil (soil with <0.4m thickness of organic material – can include humus-iron podzols, peaty podzols, peaty gleys, peaty rankers and podzolic rankers).
Medium	Soils in Grade 3b ALC agricultural land. Soils supporting protected or valued features in non-statutory designated sites (e.g. LNRs, Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; Non-Native Forest and woodland soils). Soil carbon: Mineral soils.
Low	Soils in Grade 4 and 5 ALC agricultural land. Soils supporting non-designated notable or priority habitats, soils on greenfield sites not in agricultural use (e.g. amenity land in urban areas, parks, and gardens). Soils supporting limited community/recreational/educational access to land Soil carbon: Mineral soils.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

9.5.3 Magnitude of impact

9.5.3.1 The magnitude of an impact that could affect agriculture and soils is influenced by several key factors, including the scale of the change, the spatial extent the impact is likely to occur and the duration and frequency of the impact. When defining the magnitude of the impact, criteria in accordance with the ISEP land and soils in EIA guidance (ISEP, 2022) has been followed (see **Table 9.10**). As set out in **Table 9.10**, impacts on receptors can adverse or positive.

Table 9.10: Definition of terms relating to the magnitude of an impact

Magnitude	Definition
High	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20Ha or loss of soil-related features (including effects from temporary development*), Or, Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20Ha.

Magnitude	Definition
Medium	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20Ha or loss of soil-related features (including effects from temporary development*), Or, Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20Ha
Low	Permanent, irreversible loss over less than 5Ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil-related features, Or, Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5Ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

*Temporary development can result in a permanent impact if resulting disturbance or land use changes causes permanent damage to soils.

9.5.4 Significance of effect

- 9.5.4.1 The significance of the effect upon agriculture and soils is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The method employed for this assessment is presented in **Table 9.11**.
- 9.5.4.2 Following the classification of an effect using this methodology, a clear statement will then be made as to whether that effect is significant or not significant in EIA terms. Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement is applied in reaching conclusions as to the significance of effects, particularly where a range of significance is concluded. Typical definitions for the classification of effects are set out in **Table 9.12**.

Table 9.11: Significance Evaluation Matrix: Agricultural and Soils

Sensitivity of Receptor		Magnitude of Impact			
		High	Medium	Low	Negligible
Sensitivity/importance/value	Very high	Major	Major or Moderate	Moderate	Minor
	High	Major or Moderate	Moderate	Moderate or Minor	Minor
	Medium	Moderate	Moderate or Minor	Minor	Negligible or Minor
	Low	Moderate or Minor	Minor	Negligible or Minor	Negligible or Minor
	Negligible	Minor	Negligible or Minor	Negligible or Minor	Negligible

Table 9.12: Significance definitions

Significance classification	Definition	Significance of effect
Major	A large and detrimental change to a valuable/sensitive receptor, likely exceeding an accepted threshold. A very large and beneficial change, resulting in enhancements in baseline conditions, transitioning from previously poor conditions to new legal compliance, or making a major contribution to national goals. Effects at this level are material in the decision-making process. Potentially associated with sites and features of international or national importance. Major effects may relate to features that are unique and irreplaceable.	Significant
Moderate	A medium scale change that, although not beyond an accepted threshold, is still considered to be generally unacceptable, unless offset by significant positive benefits of the project. If adverse, these effects are likely to be important at a regional or local scale and on their own could influence on decision making. A positive moderate effect is a medium scale change that is improves baseline conditions sufficiently to contribute to guideline targets.	Significant
Minor	A minor adverse change that remains within legal and planning policy limits. minor positive change that is unlikely to significantly impact the overall balance of considerations. These effects might be raised as local issues and could be relevant to the detailed design of a project, but they are unlikely to be critical in the decision-making process.	Not significant
Neutral	A very small change that is so inconsequential it can be considered acceptable to disregard. These effects fall below perceptible limits, lie within normal variations, or fall within the margin of forecasting error. They are unlikely to influence decision-making.	Not significant

9.5.5 Assumptions and limitations of the assessment

- 9.5.5.1 The information presented within the PEIR is preliminary with the final assessment of likely significant effects to be presented within the ES as part of the DCO application. The preliminary assessment has been undertaken based on the maximum design scenario as outlined within **Section 9.6.2**. The design process of the MHPGC Project is iterative and the assessment will be updated in the ES to reflect how it further evolves. Evolution of the MHPGC Project design will likely result in

refinement to areas of land take and soil disturbance, both of which will be accounted for in the assessment set out in the ES.

- 9.5.5.2 For the preliminary assessment, it has been assumed that all areas temporarily disturbed during construction and decommissioning would have soils restored so that the existing land use can resume. The assumptions for permanent land take are set out in paragraph 9.6.2.3.
- 9.5.5.3 As noted in **Section 9.4.4**, the preliminary assessment in relation to agriculture and soils has been based on desk-based ALC information and reasonable worst-case assumptions.

9.6 Key parameters for assessment

9.6.1 Scope of the assessment

- 9.6.1.1 The approach to assessment of potential effects on soil resources and BMV agricultural land was presented in the MHPGC Project Scoping Report and has been since been refined, including on the basis of feedback received through the MHPGC Project Scoping Opinion received from PINS as detailed in **Section 9.3**
- 9.6.1.2 **Table 9.13** summarises the impacts considered as part of the assessment, while a summary of the effects scoped out of the assessment is presented in **Table 9.14**.

Table 9.13: Impacts scoped into the assessment

Impact	Potential effects scoped into the assessment
Construction phase	
Permanent development	
Construction of buildings, infrastructure, hardstanding (hard development) on soils	Permanent loss of soil resources due to soil removal or soil sealing, resulting in loss of soil functions, such as carbon and nutrient cycling, water filtration and storage, terrestrial biodiversity, biomass production.
Construction of buildings, infrastructure, hardstanding (hard development) on BMV agricultural land	Permanent loss of the best available agricultural land according to the ALC system.
Temporary development	
Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils, resulting in soil compaction.	Temporary and/or permanent loss of soil functions. Potential for ALC grade to be lowered.
Soil disturbance and vegetation stripping, excavation and stockpiling of soils resulting in soil erosion and loss of organic matter resulting in soil degradation and damage to agricultural land.	Temporary and/or permanent loss of soil functions. Potential for the ALC grade to be lowered.
Soil excavation, storage in stockpiles and handling during construction resulting in degradation of topsoil due to mixing with subsoil, or contamination of soils by other materials (e.g. wastes or invasive plant species) resulting in soil degradation and damage to agricultural land.	Temporary and/or permanent loss of soils function. Potential for the ALC grade to be lowered.
Ground excavation and use of vehicles and plant can result in damage to existing land drainage (agricultural drainage systems which may include buried clay/other drains), resulting in structural damage to soil, waterlogging or erosion of soil around damaged sections, increased surface run-off, and damage to agricultural land.	Temporary and/or permanent loss of soils function. Potential for the ALC grade to be lowered.
O&M phase	
Agriculture and soils – no impacts have been identified as requiring assessment for impacts on soil and BMV land receptors during the O&M phase, however it should be noted that the following impacts that are predicted to occur during the construction phase are permanent and would therefore <i>continue</i> to affect receptors during the O&M phase: - Permanent loss of soil resources due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing - Permanent loss of BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	
Decommissioning phase	
Temporary development	
Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils, resulting in soil compaction.	Temporary and/or permanent loss of soils function. Potential for ALC grade to be lowered.
Soil disturbance and vegetation stripping, excavation and stockpiling of soils resulting in soil erosion and loss of organic matter resulting in soil degradation and damage to agricultural land.	Temporary and/or permanent loss of soil functions. Potential for the ALC grade to be lowered.
Soil excavation, storage in stockpiles and handling during construction resulting in degradation of topsoil due to mixing with subsoil, or contamination of soils by other materials (e.g. wastes or invasive plant species) resulting in soil degradation and damage to agricultural land. Potential for the ALC grade to be lowered.	Temporary and/or permanent loss of soils function.

Impact	Potential effects scoped into the assessment
Ground excavation and use of vehicles and plant can result in damage to existing land drainage (agricultural drainage systems which may include buried clay/other drains), resulting in structural damage to soil, waterlogging or erosion of soil around damaged sections, increased surface run-off, and damage to agricultural land. Potential for the ALC grade to be lowered.	Temporary and/or permanent loss of soils function.

Table 9.14: Impacts scoped out of the assessment

Impact	Justification for scoping out of the assessment
Construction phase	
N/A	N/A
O&M phase	
Permanent loss of soil resources due to maintenance of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	The potential for permanent loss of soil resources and land suitable for agriculture is confined to the construction phase as detailed in Section 9.6.2 . This impact would <i>continue</i> to affect receptors during the O&M phase but is not reassessed as the loss will only take place once. During the O&M phase, any soil disturbance would be limited to small-scale, temporary maintenance activities and is not expected to result in permanent loss of soils or agricultural land.
Permanent loss of BMV agricultural land due to maintenance of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	The potential for permanent loss of BMV land would occur during the construction phase as detailed in Section 9.6.2 . This impact would <i>continue</i> to affect receptors during the O&M phase but is not reassessed as the loss will only take place once. During the O&M phase, any soil disturbance would be limited to small-scale, temporary maintenance activities and is not expected to result in the permanent loss of BMV land.
Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils, resulting in soil compaction. Potential for ALC grade to be lowered.	During operation, condition of the cables will be monitored remotely with occasional site visits and reactive maintenance. Access to monitoring boxes and link boxes is expected on an annual basis for routine checks. Joint bays are only expected to require intrusive access in the event of a cable failure or fault resulting in replacement or repair. If required, ground disturbance would be likely to be minimal and short-term. Soil handling would be in accordance with industry good practice.
Soil disturbance and vegetation stripping, excavation and stockpiling of soils resulting in soil erosion and loss of organic matter resulting in soil degradation and damage to agricultural land. Potential for the ALC grade to be lowered.	During operation, condition of the cables will be monitored remotely with occasional site visits and reactive maintenance. Access to monitoring boxes and link boxes is expected on an annual basis for routine checks. Joint bays are only expected to require intrusive access in the event of a cable failure or fault resulting in replacement or repair. If required, ground disturbance would be likely to be minimal and short-term. Soil handling would be in accordance with industry good practice.
Soil excavation, storage in stockpiles and handling during construction resulting in degradation of topsoil due to mixing with subsoil, or contamination of soils by other materials (e.g. wastes or invasive plant species) resulting in soil degradation and damage to agricultural land. Potential for the ALC grade to be lowered.	During operation, condition of the cables will be monitored remotely with occasional site visits and reactive maintenance. Access to monitoring boxes and link boxes is expected on an annual basis for routine checks. Joint bays are only expected to require intrusive access in the event of a cable failure or fault resulting in replacement or repair. If required, ground disturbance would be likely to be minimal and short-term. Soil handling would be in accordance with industry good practice.
Ground excavation and use of vehicles and plant can result in damage to existing land drainage (agricultural drainage systems which may include buried clay/other drains), resulting in structural damage to soil, waterlogging or erosion of soil around damaged sections, increased surface run-off, and damage to agricultural land. Potential for the ALC grade to be lowered.	During operation, condition of the cables will be monitored remotely with occasional site visits and reactive maintenance. Access to monitoring boxes and link boxes is expected on an annual basis for routine checks. Joint bays are only expected to require intrusive access in the event of a cable failure or fault resulting in replacement or repair, if this is required ground disturbance would be likely to be minimal and short-term. Soil handling would be in accordance with industry good practice.
Decommissioning phase	

Impact	Justification for scoping out of the assessment
Permanent loss of soil resources due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	Onshore export and AC connection cables would be left in situ and LSS deconstructed therefore much lower temporary disturbance would be required. Permanent loss of soil resources and land suitable for agriculture is not anticipated during the decommissioning phase as no new hard development is likely and any soil disturbance would be temporary.
Permanent loss of BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	Onshore export and AC connection cables would be left in situ and LSS deconstructed therefore much lower temporary disturbance would be required. Permanent loss of soil resources and land suitable for agriculture is not anticipated during the decommissioning phase as no new hard development is likely and any soil disturbance would be temporary.

9.6.2 Maximum design scenario

- 9.6.2.1 The maximum design scenario (MDS) for each impact identified in **Section 9.6.1** has been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The MDS presented in **Table 9.15** has been selected from the parameters provided in **Volume 1, Chapter 2: Project Description, of the PEIR** and methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.
- 9.6.2.2 The MHPGC PEIR Red Line Boundary: Onshore covers an area of approximately 468.5ha, however the maximum areas of temporary and permanent land take required for the MHPGC Project will be much smaller.

Permanent development

- 9.6.2.3 Where land take is required for the MHPGC Project and where this will result in soils being 'sealed' or removed for development of buildings or infrastructure, this loss is assessed to take place during the construction phase of the MHPGC Project. The impact would occur during construction and would be permanent, i.e. it would continue during the O&M phase and decommissioning phase.
- 9.6.2.4 Along onshore export cable and AC connection cable routes through agricultural land, once cables are installed, the topsoil and all or most of the excavated subsoil would be replaced over the cables following construction. With the embedded commitments in **Table 9.16**, this will enable the baseline soil functions and agricultural land use to be restored during the operational phase of the MHPGC Project. There is however a need for permanent land take due to surface level structures including link box covers and access covers associated with TJBs and monitoring boxes, these features are therefore included in the assessment of permanent development (utilising data from the construction section of the MDS as a maximum worst-case area).
- 9.6.2.5 Based on the design information provided in **Table 9.15** the maximum (worst-case) permanent hard development (meaning areas where soils are 'sealed' or removed for development of buildings or infrastructure) resulting in land take for the MHPGC Project is 9.1ha, based on the Transition Joint Bays (TJBs), link boxes, monitoring boxes and the LSS.
- 9.6.2.6 An area of land to the south Hawthorn Pit within the MHPGC PEIR Red Line Boundary: Onshore has been identified for habitat creation including Biodiversity Net Gain. The area identified as potentially suitable for net gain, enhancement and/or mitigation is shown in **Figure 2.7, Volume 1, Chapter 2: Project Description, of the PEIR**. Further design refinement will be undertaken to establish the works and the affected area will be assessed in the Environmental Statement to consider any potential impacts on soil and agricultural receptors.

Temporary development

- 9.6.2.7 Based on **Table 9.15** the maximum (worst-case) area of temporary development (meaning areas where soils are likely to be disturbed e.g., excavated, trafficked over, or where soils will be temporarily stored/ stockpiled and then reused on site) for the MHPGC Project is 102.34ha, comprising of the following.

Limitations

- 9.6.2.8 Temporary access tracks to the cable corridor (excluding the main haul road which is considered within the working width of the onshore export cable and AC connection cable corridors) are not considered as the spatial extent is not yet defined. Once the design has progressed and information is available, these will be included in the ES. Areas required for BNG are not yet determined and therefore assessment will be undertaken following design refinement and determination of location and area to be used.

Table 9.15: MDS relevant for the assessment of potential impacts on agriculture and soils

Impact	Maximum Design Scenario	Explanation
Construction		
<i>Landfall</i>		
Landfall construction and associated earthworks resulting in a permanent loss of soil resources due to construction of infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	Landfall (trenchless technique) - Landfall trenchless drill installation method: Horizontal Directional Drilling (HDD) or Direct Pipe; - Maximum burial depth of trenchless drill (per bore): 80m bgl; - Maximum trenchless drill length: 2km; - Duration of trenchless drilling activity: 300 days; - Construction period for Landfall: 3.5 years. Landfall Infrastructure onshore (landward of MHWS) - Maximum width of trenchless drill area, west of Durham Coast Line: 400m; - Corridor length: 800m; - Number of trenchless drill entry points: 4 bores; - Material quantities associated with excavation: 130,000m³. Transition Joint Bays - Number of TJBs: 2; - Location of TJBs: Within 150m of landfall trenchless drill entry point; - Working Area for TJB (construction): 750m² - Depth of TJB: 2.5m Landfall construction compound - Number of main compounds: 1; - Dimension of main compound: 48,000m²; - Number of secondary compounds: 1; - Dimension of secondary compound: 900m²; - Number of access tracks: 2 from A192; - Construction access track widths: 10m; - Drilling mud: bentonite and/or polymer fluids.	These parameters represent the MDS with respect to area and duration and the maximum area of disturbance to soils and agriculture receptors within the Landfall area.

Impact	Maximum Design Scenario	Explanation
<i>Onshore Export Cable and AC Connection Cable</i>		
Onshore cable construction and associated earthworks (temporary development): Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils Soil disturbance and vegetation stripping, excavation and stockpiling of soils	Construction corridor length: 9.59km Construction period for Onshore Export Cable: 42 months Installation of cables - onshore export cable (HVDC) 320kV HVDC circuit comprising of Fibre Optic and Conductor cables; - Construction period for Onshore Export Cable: 3.5 years Dimensions of trench for AC connection export cable (HVAC) – Blue LSS - Number of export cables: 24; - Length of cable route: 4,260m; - Number of cable trenches: 4; - Width of cable corridor (temporary including permanent): 100m; - Onshore cable area (temporary): 426,000m²; - Trench width at top per circuit: 4.8m; - Trench width at base per circuit: 2.8m; - Trench depth per circuit: 9.8m; - Depth of stabilised backfill: 450mm; - Number of cable route joint bays: 32; - Number of link boxes: 32; - Volume of material excavated per joint bay: 2,264m³ (<u>total = 18,112m³, assuming 4 circuits are jointed in a single excavation</u>); - Construction land take for joint bay (surface area): 1,472m² (<u>total = 11,776m², assuming 4 circuits are jointed in a single area</u>); - Construction land take for link box: 100m² (total = 3200m²); - Volume of material excavated per link box: 12.5m³; - Volume of material excavated (link boxes): 400m³. Dimensions of trench for onshore export cable (HVDC) – Blue LSS - Number of export cables: 4;	These parameters represent the MDS with respect to area and duration and resultant extent of disturbance to soils and agriculture receptors within the Onshore Export Cable and AC Connection Cable Corridor. The Onshore Export Cable and AC Connection Cable parameters defined in this MDS are those required to construct the MHPGC Project, including the Blue LSS option. The Blue LSS option constitutes the worst-case due to the larger cable corridor width and thus area of temporary land-take required, when compared to the Green LSS Option.

Impact	Maximum Design Scenario	Explanation
	- Length of cable route: 4.83km; - Width of cable corridor (temporary inc. permanent): 40m; - Number of cable trenches: 2; - Onshore cable area (temporary): 193,200m²; - Trench width at top: 6.85m; - Trench width at base: 4m; - Cable trench depth: 9.8m; - Depth of stabilised backfill: 450mm; - Number of cable route joint bays: 12; - Volume of material excavated per joint bay: 700m³ (total = 8,400m³); - Construction land take per joint bay (surface area): 600m² (Total for all joint bays = 7,200m²) (<i>permanent development area</i>); - Volume of material excavated per monitoring box: 18m³ (total = 216m³); - Construction land take per monitoring box: 64m²; - Construction land take for all monitoring boxes: 768m²; Infrastructure - Number of haul roads: 1; - Haul road construction: geogrids and 500mm stone; - Haul road widths: 8m; - Haul road depth: 0.5; - Dimensions of temporary culvert/bridge crossings for the haul road: 10 x 6 x 5; - Number of main compounds: 2; - Main compound dimensions: 7ha; - Total area of main compounds: 14ha ; - Number of secondary construction compounds: 6; - Dimensions per secondary construction compound: 10,000m²; - Total area of secondary construction compounds: 6ha. Trenchless Drill Crossings Major Crossings would be A19, B1432 and Hesledon Moor SSSI. - Trenchless drill methodology: HDD, micro-tunnelling (auger bore or direct pipe);	

Impact	Maximum Design Scenario	Explanation
	- Number of trenchless drill compounds: 6 (3 entry and 3 exit trenchless drill compounds); - Dimensions of trenchless drill compounds: 6,000m²; - Total trenchless drill compound area: 36,000m²; - Trenchless depth (excluding landfall): 30m; - Drilling mud used: bentonite and/or polymer fluids. Construction Access - Number of construction access tracks (excluding existing tracks): 6.	
<i>Onshore Land Substation</i>		
Onshore Land Substation construction and associated earthworks resulting in a permanent loss of soil resources due to construction of infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	- Construction period for LSS: 4.5 years; - Area of temporary construction footprint: 7ha (<i>used for temporary development area</i>); - Area of temporary works (laydown and storage): 3.5ha (<i>used for temporary development area</i>); - Number of buildings: 15; - Width of main building/structure: 100m; - Length of main building/structure: 200m. LSS Construction - Description of foundations: raft or pile caps (suspended structure) or piled foundations and suspended structures; - Volume of excavation for foundations: 20,000m³; - Cut and fill balance: 50,000m³; - Material types and quantities associated to excavation: 14,000m³ topsoil, 65,000m³ other materials; - Estimated waste quantities: 50,000m³. Access - Temporary width of access including passing bays: 15m; - Number of temporary accesses: 2; - Reinstatement of temporary land: 4 months. Permanent footprint Area of permanent footprint: 6.73ha	These parameters represent the MDS with respect to area and duration and resultant extent of disturbance to soils and agriculture receptors within the LSS Areas (Green and Blue). With respect to the optionality between an AIS and GIS solutions, the MDS is defined by the largest footprint.
O&M		

Impact	Maximum Design Scenario	Explanation
Landfall – see Construction section above for permanent development assessed at construction stage		
Onshore Export Cable – see Construction section above for permanent development assessed at construction stage		
Land Substation - see Construction section above for permanent development assessed at construction stage		
Decommissioning		
<i>Landfall</i>	Leave cables in place, to minimise/avoid environmental disturbance. Leaving the cables in place has little or no environmental impact whilst recovering them would disturb the local environment.	
<i>Onshore Export Cable</i>		
<i>Land Substation</i>	Deconstruction in the inverted sequence of installation, after the Land Substation (LSS) has been decommissioned. All equipment and materials including foundations will be demolished and disposed of, in accordance with the latest relevant guidance. The site will be reinstated in accordance with best practice at the time.	

9.7 Commitments adopted as part of the MHPGC Project

- 9.7.1.1 As set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** and **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**, several measures have been adopted as part of the MHPGC Project to reduce the potential for impacts on agriculture and soils.
- 9.7.1.2 Embedded mitigation includes the following measures as identified in the ISEP, formerly IEMA Guide to Shaping Quality Development (IEMA, 2015):
- Primary mitigation - measures included as part of the project design. ISEP (formerly IEMA) describes these as *“modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken”*. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and marine licence, or both;
 - Tertiary mitigation - ISEP (formerly IEMA) describes these as *“actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects”*.
- 9.7.1.3 Embedded mitigation measures that will form part of the final design (and are established legislative requirements/good practice, or both) have been taken into account as part of the initial assessment presented in **Section 9.8** (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures that the Applicant is committed to are considered in the assessment of effects.
- 9.7.1.4 Where an assessment identifies likely significant adverse effects, secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by ISEP (formerly IEMA) as *“actions that will require further activity to achieve the anticipated outcome”* and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures both pre-mitigation and residual effects are presented.
- 9.7.1.5 The measures relevant to agriculture and soils are outlined in **Table 9.16**. As there is a secured commitment to implementing these measures, they are considered inherently part of the design of the MHPGC Project and have therefore been considered in the assessment presented in **Section 9.8**.

Table 9.16: Embedded commitments relevant to agriculture and soils implemented as part of the MHPGC Project

Commitment number	Measure adopted	How the measure will be secured
CoT16	An Onshore Decommissioning Plan will be developed prior to decommissioning. It will include provisions for the removal of all onshore above ground infrastructure and the decommissioning of below ground infrastructure (if and where relevant and practicable), and details relevant to flood risk, pollution prevention, protection of soils and avoidance of ground disturbance. The Onshore Decommissioning Plan will be in line with the latest relevant legislation and available guidance at the time of production, as far as reasonably practicable.	Will be secured via DCO Schedule &/or Requirement
CoT17	Where practicable, the siting of the temporary and permanent footprint of the MHPGC Project will avoid areas of Flood Risk Zone 2 and 3, sensitive historic, cultural, ecological and other environmental receptors, both statutory and non-statutory, during the site selection process for the MHPGC Project.	Will be secured via DCO Schedule &/or Requirement
CoT18	An Outline Code of Construction Practice (CoCP) will be prepared and submitted with the application for development consent. A Detailed CoCP will be developed substantially in accordance with the Outline CoCP. The Outline CoCP will include (but is not limited to) measures to maintain and address: • Flood protection and control measures; • Water environment and drainage; • Noise and vibration management measures; • Air quality and dust management; • Pollution prevention and management; • Geology and ground conditions; • Soil and materials management; • Land use, tourism and recreational assets; • Waste management.	Will be secured via DCO Schedule &/or Requirement
CoT23	An Outline Surface Water and Groundwater Management Plan (SWGMP) will form part of the Outline CoCP, will be submitted with the application for development consent. The Outline SWGMP will set out measures to protect surface water and groundwater during construction, covering surface water and drainage management measures, flood risk control measures, and management of foul water from construction compounds. A Detailed SWGMP will be developed substantially in accordance with the Outline SWGMP.	Will be secured via DCO Schedule &/or Requirement
CoT40	An Outline SMP will form part of the Outline CoCP, which will be prepared and submitted as part of the application for the development consent. A Detailed SMP will be developed substantially in accordance with the Outline SMP, in order to characterise and manage soil materials during construction. Soil types would be determined via site-specific survey work as set out in the Outline SMP.	Will be secured via DCO Schedule &/or Requirement

Commitment number	Measure adopted	How the measure will be secured
CoT42	Vegetation, including trees, woodland and hedgerows, will be mapped through a Vegetation Retention Plan (or similar) to inform construction activities, with vegetation retained wherever practicable. All vegetation works will be undertaken in accordance with BS 5837:2012, including the implementation of appropriate root protection measures. These measures will be consolidated within an Arboricultural Management Plan that will form part of the Outline Landscape and Ecological Management Plan, which will be prepared and submitted with the application for development consent.	Will be secured via DCO Schedule &/or Requirement
CoT43	An Outline Landscape and Ecological Management Plan (LEMP) will be prepared and submitted with the development consent application and will establish the mitigation and management measures relevant to terrestrial and intertidal ecology and conservation. It will include: • mitigation measures relating to protected or notable species and/or sensitive habitats; • appointment of an Ecological Clerk of Works (ECoW) where required; • details of mitigation planting at the onshore substation site including the number, location, species and details of management and maintenance of planting. A Detailed LEMP will be developed substantially in accordance with the Outline LEMP.	Will be secured via DCO Schedule &/or Requirement
CoT47	An Outline Construction Fencing Plan, will form part of the Outline Code of Construction Practice (CoCP), which will be prepared and submitted with the development consent application. All temporary working areas, including in relation to the Transition joint bays, onshore export cables, the preferred onshore LSS option, and the AC connection cables will be made clear through the use of signage and secured with appropriate fencing. A Detailed Construction Fencing Plan will be developed in accordance with the Outline Construction Fencing Plan.	Will be secured via DCO Schedule &/or Requirement
CoT62	A Design Principles will be produced and submitted as part of the application for development consent. It will focus on design elements associated with the onshore LSS fulfilling the requirement for 'good design', as prescribed in the National Policy Statements EN-1, EN-3 and EN-5.	Will be secured via DCO Schedule &/or Requirement

9.8 Assessment of impacts

9.8.1 Overview

- 9.8.1.1 This section includes the assessment of the impacts to agriculture and soils arising from the construction, O&M and decommissioning phases of the MHPGC Project. A summary of the effects is presented in **Table 9.18**. Where impacts listed in **Table 9.13** result in similar potential effects, these have been grouped below to avoid repetition.

9.8.2 Construction phase

Permanent development

- 9.8.2.1 The construction associated with the MHPGC Project will result in the permanent removal, displacement, burial and sealing of soil resources within the LSS area, at the TJBs and link box locations. As identified in **Table 9.13**, this may result in the permanent loss of or significant reduction of most soil functions. The potential impact pathways associated with the permanent development of the MHPGC Project are:

- Permanent loss of soil resources due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing.
- Permanent loss of BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing.

- 9.8.2.2 The maximum area of potential permanent hard development associated with the MHPGC Project is estimated to be 9.1ha, as detailed in **Section 9.6.2**. This represents the worst-case scenario for soils and BMV agricultural land due to land use change from agricultural to hard development.

Receptor sensitivity

- 9.8.2.3 The soil resource sensitivity is defined as per **Table 9.9** using the baseline information in **Section 9.4**. Based on the likely presence of BMV land in areas proposed for permanent development, the main criteria influencing soil sensitivity is the ALC grade, reflecting the versatility and biomass production capability of soils in BMV land.

- 9.8.2.4 For the TJBs and the permanent infrastructure located along the cable route including joint bays, link boxes and monitoring boxes, and the Blue LSS Option Area, a precautionary approach has been made to assume that these features are located in BMV land comprising ALC subgrade 3a or grade 2 soils. In accordance with **Table 9.9**, these land grades correspond to a receptor sensitivity of **high to very high**, respectively. **Table 9.7** indicates that most agricultural land within the Agriculture and Soils study area is likely to comprise ALC Subgrade 3a, however available post 1988 survey information also confirms that some Grade 2 and Subgrade 3b land occurs within the Agriculture and Soils study area. Lower ALC grades may also be present. The distribution of ALC grades will be confirmed through site-specific ALC surveys undertaken for the ES.

- 9.8.2.5 No ALC Grade 1 land has been identified within the MHPGC Project area based on post-1988 ALC survey data, nor is it predicted to occur within the site according to the predictive ALC mapping. Furthermore, **Table 9.8**, indicates that Grade 1 land represents only approximately 0.03% of agricultural land within County Durham, suggesting a very low likelihood of the MHPGC Project affecting this highest quality Grade 1 agricultural land.

- 9.8.2.6 Given the available evidence and the expectation that the majority of land affected by the permanent infrastructure and Blue LSS Option Area is likely to be ALC Subgrade 3a, the sensitivity of the agricultural land resource is refined to **high** for the purposes of the assessment. This represents a realistic worst-case scenario pending the completion of site specific ALC surveys.

Impact magnitude

- 9.8.2.7 Of the 9.1ha required for permanent land take, 6.5ha of this is associated with the Blue LSS Option and is grade 3a as detailed in **Table 9.7**.

- 9.8.2.8 If the Green LSS Option Area was selected, this would utilise brownfield land and the maximum area of permanent development on soils assumed to be in BMV agricultural land would drop to 2.31ha

which would be a low magnitude of impact, however for this initial assessment the worst-case scenario associated with the Blue LSS has been applied.

- 9.8.2.9 As the Blue LSS Option would result in the permanent, irreversible loss of soil resource and BMV agricultural land over an area of between 5 and 20Ha or loss of soil-related features, the impact magnitude, according to **Table 9.10** is **medium**.

Significance of effect

- 9.8.2.10 Based on **high** or **very high** sensitivity soil resources in BMV agricultural land, and a **medium** magnitude of impact, using the matrix in **Table 9.11** the resulting effect is **moderate** or **major or moderate** and **significant** in EIA terms.

Additional mitigation and residual effect

- 9.8.2.11 For the worst-case scenario assessed in the PEIR, no additional mitigation has been identified at this stage. Based on a **high** or **very high** sensitivity receptor and a **medium** magnitude of impact, the residual effect is concluded to be **moderate** or **major or moderate** and **significant** in EIA terms.

Temporary development

- 9.8.2.12 As explained in **Table 9.11**, impacts to soils and agricultural land that occur during temporary development work (e.g., construction) can be permanent if soils are irreparably damaged (examples could be severe compaction of subsoil and topsoil, contamination of topsoils, loss of topsoil due to vegetation stripping and subsequent erosion of soils by heavy rain). The potential impact pathways associated with the temporary development of the MHPGC Project are:

- Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils, resulting in soil compaction (with potential for ALC grade to be lowered);
- Soil disturbance and vegetation stripping, excavation and stockpiling of soils resulting in soil erosion and loss of organic matter resulting in soil degradation and damage to agricultural land (with potential for the ALC grade to be lowered);
- Soil excavation, storage in stockpiles and handling during construction resulting in degradation of topsoil due to mixing with subsoil, or contamination of soils by other materials (e.g. wastes or invasive plant species) resulting in soil degradation and damage to agricultural land (with potential for the ALC grade to be lowered).

- 9.8.2.13 The construction of the MHPGC Project could temporarily affect areas of BMV land during the construction phase due to activities including movement and parking of vehicles and plant, creation of temporary laydown areas and temporary access routes, vegetation stripping, soil excavation, soil storage and subsequent soil handling (including where soils can be replaced over buried cables), temporary compounds (main compounds, secondary compounds, trenchless crossing entry/exit compounds).

- 9.8.2.14 The maximum area of temporary development associated with the MHPGC Project is estimated to be up to 102.34 ha, as detailed in **Section 9.6.2**. This represents the worst-case scenario for soils and BMV agricultural land due to temporary impacts on soil resources and BMV land. For the assessment it is assumed that the Blue LSS Option Area is selected, as this results in the longest possible onshore cable routing from the landfall.

Receptor sensitivity

- 9.8.2.15 The soil resource sensitivity is defined as per **Table 9.9** using the baseline information in **Section 9.4**.
- 9.8.2.16 The onshore export cable corridor and AC connection cable corridor are assumed to be located in BMV land of either ALC subgrade 3a or grade 2, giving a receptor sensitivity according to **Table 9.9** of high to very high. Based on **Table 9.7**, a larger proportion of the land is likely to be subgrade 3a which is high sensitivity. Grade 2 is possible, which is very high sensitivity. Lower ALC grades are also possible and the true proportion of each ALC grade will need to be confirmed by site specific ALC survey. No Grade 1 land has been confirmed to date by post 1988 ALC data, or is predicted to be onsite by the predictive ALC map. Based on this information and **Table 9.8**, there is a low likelihood of the MHPGC Project encountering Grade 1 land, as Grade 1 is estimated to be present

in just 0.03% of the agricultural land in County Durham. For assessment purposes receptor sensitivity of **high to very high** has been applied as a worst case.

Impact magnitude

- 9.8.2.17 The magnitude of impact is considered to be **negligible**, with the implementation of relevant embedded mitigation measures to protect soils, including CoT40, to develop an Outline Soil Management Plan (SMP) to form part of the Outline CoCP, ensuring appropriate handling and sustainable use of soils.
- 9.8.2.18 There is also a commitment to develop a Vegetation Retention Plan (or similar) to inform construction activities, with vegetation retained wherever practicable and the implementation of appropriate root protection measures (CoT42). These measures will be consolidated within an Arboricultural Management Plan that will form part of the Outline Landscape and Ecological Management Plan (CoT43), which will be prepared and submitted with the application for Development Consent. This will protect long undisturbed soils at the boundaries of or within agricultural fields and can help to conserve soil biodiversity that will be integral to the recovery of disturbed soils back to baseline levels post construction of the MHPGC Project.
- 9.8.2.19 In regard to preventing compaction of soils, other relevant measures include the commitment to develop an Outline Construction Fencing Plan (CoT46), to form part of the Outline CoCP. This will define temporary working areas, using signage and appropriate fencing which will limit the area of soil disturbance to areas where soil protection measures are in place (such as access tracks or compounds where topsoil has been temporarily removed to protect it and temporary hard surfaces are in place).

Significance of effect

- 9.8.2.20 Based on **high** or **very high** sensitivity soil resources in BMV agricultural land, and a **negligible** magnitude of impact, using the matrix in **Table 9.11** the resulting effect is concluded to be **minor** and **not significant** in EIA terms. The likely receptor sensitivity is considered to be high given that most land proposed for development is likely, according to **Table 9.7**, to be subgrade 3a at best.

Additional mitigation and residual effect

- 9.8.2.21 For the worst-case scenario assessed in the PEIR, no additional mitigation has been identified. Based on a **high** sensitivity receptor and a **negligible** magnitude of impact, the residual effect is concluded to be **minor** and **not significant** in EIA terms. No further mitigation is required as the residual effect is not significant.

9.8.2.22 A further impact pathway associated with the temporary development of the MHPGC Project is:

- Ground excavation and use of plant during ground works can result in damage to existing land drainage (agricultural drainage systems which may include buried clay/other drains), resulting in structural damage to soil, waterlogging or erosion of soil around damaged sections, increased surface run-off, and damage to agricultural land (with potential for the ALC grade to be lowered).

9.8.2.23 Land drains may be present on agricultural land affected by the Proposed Development, particularly where clayey soils are present and may include buried clay drains, typically at 0.75m to 9.20m below ground level, and which can be damaged during excavation work. If this is not addressed, it can result in ponding or waterlogging of previously well-drained land.

9.8.2.24 The area of potential impact is unlikely to exceed the maximum area of temporary development of 102.34ha and this has therefore been used in the assessment.

Receptor sensitivity

9.8.2.25 The onshore export cable corridor and AC connection cable corridor are assumed to be located in BMV land of either ALC subgrade 3a or grade 2, giving a receptor sensitivity according to **Table 9.9** of high to very high. Based on **Table 9.7**, a larger proportion of the land is likely to be subgrade 3a which is high sensitivity. Grade 2 is possible, which is very high sensitivity. Lower ALC grades are also possible and the true proportion of each ALC grade will need to be confirmed by site specific ALC survey. No Grade 1 land has been confirmed to date by post 1988 ALC data or is predicted to be onsite by the predictive ALC map. Based on this information and **Table 9.8**, there is a low likelihood of the MHPGC Project encountering Grade 1 land, as Grade 1 is estimated to be present in just 0.03% of the agricultural land in County Durham. For assessment purposes receptor sensitivity of **high to very high** has been applied as a worst case.

Magnitude of impact

9.8.2.26 As outlined above, there is the potential for damage to occur to existing agricultural drainage systems which could result in structural damage to soils which could cause waterlogging, compaction, and erosion, however the implementation of relevant embedded mitigation measures, as set out in **Section 9.7** will minimise the magnitude of impact. The Outline CoCP (CoT18) will include measures to maintain and address water environment and drainage, and soil and materials management.

9.8.2.27 The Outline Surface Water and Groundwater Management Plan (Outline SWGMP) (CoT23) will form part of Outline CoCP and will set out measures to protect surface water and groundwater during construction, including surface water and drainage management measures, and flood risk control measures.

9.8.2.28 The Outline SWGMP (CoT23) will include measures to protect existing land drainage regimes during construction and ensure existing systems are reinstated to pre-existing condition following the completion of works where practicable.

9.8.2.29 Based on the implementation of the commitments above, the magnitude of impact is assessed as **negligible**.

Significance of effect

9.8.2.30 Based on high or very high sensitivity soil resources in BMV agricultural land, and a negligible magnitude of impact, using the matrix in **Table 9.11** the resulting effect is concluded to be **slight** and **not significant** in EIA terms. The likely receptor sensitivity is considered to be high given that most land proposed for development is likely, according to **Table 9.7**, to be subgrade 3a at best.

Additional mitigation and residual effect

9.8.2.31 For the worst-case scenario assessed in the PEIR, no additional mitigation has been identified. Based on a **high sensitivity** receptor and a **negligible impact**, the residual effect is concluded to be **minor** and **not significant** in EIA terms.

9.8.3 Operation and Maintenance

9.8.3.1 Although no likely significant effects have been identified as requiring assessment for impacts on soil and BMV land receptors during the O&M phase, the following impacts that are predicted to occur during the construction phase (as identified within **Section 9.8.2**, of this chapter) are permanent and would therefore continue to affect receptors during the O&M phase:

- Permanent loss of soil resources and permanent loss of BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing.

9.8.4 Decommissioning phase

9.8.4.1 The following impacts are predicted to occur during the construction phase (as identified within **Section 9.8.2**, of this chapter) are permanent and would therefore continue to affect receptors during the decommissioning phase:

- Permanent loss of soil resources and permanent loss of BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing.

9.8.4.2 The extent of works relating to the decommissioning phase and the interaction with soils and BMV will be determined through further refinement of the Project to inform the application for development consent.

9.9 Cumulative effects

9.9.1 Cumulative effects assessment

9.9.1.1 The Cumulative Effects Assessment (CEA) considers the impacts associated with the MHPGC Project together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter, are based upon the results of a screening exercise (**Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR**). Each project or plan has been considered on a case-by-case basis for screening in or out of the soil resources and BMV agricultural land CEA based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

9.9.1.2 The specific projects and plans screened into the CEA for soil resources and BMV agricultural land are outlined in **Table 9.17**. All the projects and plans screened in are located partly or fully within the Agriculture and Soils Study Area, which is the MHPGC PEIR Red Line Boundary: Onshore, landward of MHWS with a 250m buffer applied.

9.9.1.3 Agricultural land and soil resources are effectively finite non-renewable resources due to the long periods over which soils form, and therefore there will be a cumulative impact on these receptors from other developments where they result in temporary disturbance to soils (without suitable mitigation to avoid soil damage), and/ or hard development where soils are removed or sealed. These impacts will occur during the construction phase and are likely to be permanent. The sensitivity of the soils within the MHPGC PEIR Red Line Boundary: Onshore has been defined for the assessment based on their ALC grade, given that the land affected by the MHPGC Project is mainly in agricultural use, BMV land is present, and no other features that would increase soil sensitivity (such as the presence of peat or nature conservation designations) as set out in **Table 9.9** were identified. The CEA therefore considers the potential permanent loss of agricultural land and soil resources that may result from these projects and plans in combination with the MHPGC Project, which as outlined **Section 9.6.2** may result in the permanent loss of up to 9.1 ha of BMV land and high sensitivity soil resources.

9.9.1.4 Commentary is included in **Table 9.17** on the potential of the other projects and plans to permanently impact soil resources and BMV agricultural land. This is based on review of information on the planning portal. Based on the available information reviewed, developments on agricultural land total approximately 179.43ha (11 + 60 + 77.5 + 6 + 8.93 + 6 + 10 ha), of which around 84 ha could be BMV (based on estimates of only ALC grade 2 and subgrade 3a – no grade 1 land is recorded). This is a

conservative area estimate as the planning information typically does not provide details of how much BMV land will be permanently impacted. In combination with the MHPGC Project this could result in the loss of 93.19ha of BMV agricultural land. The period over which this loss could occur is unclear from the available planning information, and some of the projects are already under construction (i.e. the loss has already occurred). Using the construction timescale for the MHPGC Project (5 years) this could equate to an average annual loss of 18.64ha (of which the average annual contribution from the MHPGC Project would be 9.5%).

- 9.9.1.5 The total estimated loss of BMV land is equivalent to 0.27% of BMV land in Durham, this percentage is based on **Table 9.8** which records the total BMV land area in County Durham as around 34,886.9ha. If the loss is divided over 5 years to match the MHPGC Project construction timescale, this drops to 0.05% per year. Land use change statistics for agricultural land and specifically BMV agricultural land are not presently available for County Durham to see how this loss compares to the average annual loss. County Durham is noted to have a much lower percentage of BMV agricultural land (18.74%) than the average for England, which is estimated at 50.9% of all agricultural land (Cranfield Environment Centre, 2025), this means the loss is greater in the local context than in the national context. Given the higher regional sensitivity to loss of BMV land, conservatism in the area of BMV land assumed to be lost, and the average annual loss of BMV land being in the region of 0.05% of the total area of BMV land, the cumulative effect is considered to be **not significant** in EIA terms.

Table 9.17: Projects and plans screened in to Agriculture and Soils CEA

Project / Plan name	Type	Tier and status	Construction timeframe	Planning document review summary for Agriculture and Soils receptors	Development on confirmed or possible BMV land?
DCC3 - Land West of Units 1-3 Admiralty Way Seaham, Erection of a petrol filling station and drive thru' coffee outlet (Class E)	Commercial	1 – consented	Under construction	Development covers 11ha on agricultural land shown on the predictive ALC map as Grade 2.	Yes
DCC4 - EGL1 Visitor Centre	Commercial	1 – in planning – application submitted	Detail not available	Brownfield land.	No
DCC5 - Croup Hill Solar Farm	Renewable energy	1 – consented	Detail not available	Development covers >60ha agricultural land, shown as subgrade 3b (post 1988 ALC map) and subgrade 3a (predictive ALC map).	Yes - partial
DCC6 - Seaham Garden Village - 1500 dwellings	Residential	1 – consented	Under construction, due to be complete 2030	Development covers 77.75ha, on agricultural land of ALC grades 2, 3a and 3b.	Yes – partial
DCC7 - Phase 2 Jade Business Park	Commercial	1 – consented	Detail not available	Brownfield land	No
DCC8 - Transport hub and active travel scheme	Transport	1 – consented	Under construction, due to be complete April 2027	Brownfield land.	No

Project / Plan name	Type	Tier and status	Construction timeframe	Planning document review summary for Agriculture and Soils receptors	Development on confirmed or possible BMV land?
DCC9 - Temporary installation of a battery energy storage system	Renewable energy	1 – in planning – application submitted	Detail not available	Brownfield land.	No
DCC10 - Battery Energy Storage System	Energy	1 – in planning – application submitted	12-month construction programme	Development covers ~6ha on agricultural land confirmed by ALC survey to subgrade 3b.	No (subgrade 3b)
DCC11 - Eastern Green Link 1, Converter Station	Energy	1 – consented	Under construction, works to be complete in 2029	Development is on previously developed land restored to agriculture, covering 8.93ha. Partial post 1988 ALC mapping shows subgrade 3a and 3b.	Yes - partial
DCC12 - 81 homes and a convenience store	Mixed residential/commercial	1 – in planning – application submitted	Detail not available	Development covers ~6ha on agricultural land, post 1988 ALC map shows 3b and predictive ALC map 3a. Soil resource management strategy in place.	Yes - partial
DCC13 - 149 homes, Land East of Seaham Garden Village	Residential	1 – in planning – application submitted	Detail not available	Development covers 10ha on agricultural land, post 1988 ALC map shows subgrade 3a and predictive ALC map grade 2. Soil resource management strategy in place.	Yes

9.10 Transboundary effects

- 9.10.1.1 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects from the construction, O&M and decommissioning phases of the MHPGC Project upon interests of other states has been assessed as part of the PEIR.
- 9.10.1.2 The potential transboundary impacts are screened within **Volume 1, Annex 4.2: Transboundary Screening, of the PEIR**.
- 9.10.1.3 There are no potentially significant transboundary effects on Agriculture and Soils receptors from the MHPGC Project and these are therefore not considered further in this chapter.

9.11 Inter-related effects

- 9.11.1.1 Inter-related effects are the combined impact of multiple aspects of the MHPGC Project on a single receptor. These are as follows:
- **Project lifetime effects:** Assessment of the scope for effects that occur throughout more than one phase of the MHPGC Project (construction, O&M and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases.
 - **Receptor led effects:** Assessment of the scope for all effects (including inter-relationships between environmental topics) to interact, spatially and temporally, to create inter-related effects on a receptor.
- 9.11.1.2 Inter-related effects are assessed within **Volume 4, Chapter 5: Inter-related Effects, of the PEIR** and are summarised below:
- Project lifetime effects from permanent loss of soil resource and BMV agricultural land and disturbance.
 - Receptor led effects for interactions with those effects assessed in **Volume 3, Chapter 2: Water Resources and Flood Risk, of the PEIR, Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology of the PEIR, Volume 3, Chapter 5: Traffic and Transport, of the PEIR, Volume 3, Chapter 8: Land Use, Tourism and Recreation, of the PEIR and Volume 4, Chapter 3: Socio-economic, of the PEIR**.
- 9.11.1.3 No significant inter-related effects have been identified and assessment conclusions are detailed within **Volume 4, Chapter 5: Inter-related Effects, of the PEIR**.

9.12 Summary

9.12.1 Summary of effects

- 9.12.1.1 This chapter has assessed the potential impacts on agriculture and soils resulting from the construction, O&M and decommissioning phases of the MHPGC Project.
- 9.12.1.2 **Table 9.18** presents a summary of impacts and confirms the residual effects.

9.12.2 Summary of secondary mitigation and monitoring

- 9.12.2.1 No secondary mitigation or monitoring is proposed at this stage.

Table 9.18: Summary of potential impacts and residual effects

Impact	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Construction phase					
Permanent loss of soil resources and BMV agricultural land due to construction of buildings, infrastructure, hardstanding (hard development) resulting in soil removal or soil sealing	High to very high	medium	moderate to major (significant)	N/A	moderate to major (significant)
Potential impacts relating to soil disturbance and handling during construction work, are as follows: • Use of vehicles, and plant, materials and equipment laydown and storage activity, and handling and stockpiling of soils, resulting in soil compaction. Potential for ALC grade to be lowered. • Soil disturbance and vegetation stripping, excavation and stockpiling of soils resulting in soil erosion and loss of organic matter resulting in soil degradation and damage to agricultural land. Potential for the ALC grade to be lowered. • Soil excavation, storage in stockpiles and handling during construction resulting in degradation of topsoil due to mixing with subsoil, or contamination of soils by other materials (e.g. wastes or invasive plant species) resulting in soil degradation and damage to agricultural land. Potential for the ALC grade to be lowered.	High to very high	negligible	minor (not significant)	N/A	minor (not significant)
Ground excavation and use of plant during ground works can result in damage to existing land drainage (agricultural drainage systems which may include buried clay/other drains), resulting in	High to very high	negligible	minor (not significant)	N/A	minor (not significant)

Impact	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
structural damage to soil, waterlogging or erosion of soil around damaged sections, increased surface run-off, and damage to agricultural land (with potential for the ALC grade to be lowered)					
O&M phase					
No further effects beyond those reported to commence within the construction phase considered permanent.					
Decommissioning phase					
The decommissioning phase will not result in any new or materially different impacts on agriculture and soils beyond those already assessed for the construction and O&M phases.					

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