

Yorkshire GREEN Project

Environmental Impact Assessment

Preliminary Environmental Information Report
Volume Two: Chapter 11: Agriculture and Soils

October 2021

nationalgrid

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11. Agriculture and Soils

11. Agriculture and Soils

11.1 Introduction

11.1.1 This chapter presents the preliminary assessment of the likely significant effects of Yorkshire Green Energy Enablement (GREEN) Project (the Project) with respect to agriculture and soils. The preliminary assessment is based on information obtained to date. It should be read in conjunction with the Project description provided in **Chapter 3: Description of the Project** and with respect to relevant parts of the following chapters:

- **Chapter 8: Biodiversity** for details of habitats and species occurring on the agricultural land discussed in this chapter;
- **Chapter 9: Hydrology** for details of the local water environment;
- **Chapter 10: Geology and Hydrogeology** for details of the underlying geology (soil parent materials); and
- **Chapter 16: Socio-economics** for details of rural and agricultural businesses.

11.1.2 This chapter describes:

- the legislation, policy and technical guidance that has informed the assessment (**Section 11.2**);
- consultation and engagement that has been undertaken and how comments from consultees relating to agriculture and soils have been addressed (**Section 11.3**);
- the methods used for baseline data gathering (**Section 11.4**);
- overall baseline (**Section 11.5**);
- embedded measures relevant to agriculture and soils (**Section 11.6**);
- the scope of the assessment for agriculture and soils (**Section 11.7**);
- the methods used for the assessment (**Section 11.8**);
- the preliminary assessment of agriculture and soils effects (**Section 11.9**);
- preliminary assessment of cumulative (inter-project) effects (**Section 11.10**);
- a summary of the preliminary significance conclusions (**Section 11.11**);
- additional measures proposed (**Section 11.12**);
- agriculture and soils residual effects assessment (**Section 11.13**); and
- an outline of further work to be undertaken for the Environmental Statement (ES) (**Section 11.14**).

Project overview

11.1.3 In summary Yorkshire GREEN comprises the following new infrastructure within the draft Order Limits:

- Shipton North and South 400kV cable sealing end compounds (CSECs);

- The YN 400kV overhead line (north of the proposed Overton Substation);
- Overton 400/275kV Substation;
- Two new sections of 275kV overhead line south of Overton Substation: the XC 275 kV overhead line to the west and the SP 275kV overhead line to the east;
- Tadcaster Tee West and East 275kV CSECs; and
- Monk Fryston 400kV Substation (adjacent to the existing substation).

11.1.4 Works to existing infrastructure within the draft Order Limits would comprise:

- Replacement of one pylon on the 2TW/YR 400kV overhead line;
- Works to the existing XC/XCP Monk Fryston to Poppleton overhead line comprising a mixture of decommissioning, replacement and realignment east of Moor Monkton and reconductoring works south of Moor Monkton. This overhead line would be reconfigured at its southern end to connect into the new substation at Monk Fryston;
- Replacement of one pylon on the Tadcaster Tee to Knaresborough (XD/PHG) 275kV overhead line route;
- Reconfiguration and removal of a short span of the Monk Fryston to Eggborough 400kV 4YS overhead line to connect this overhead line into the new substation at Monk Fryston; and
- Minor works at Osbaldwick Substation comprising the installation of a new circuit breaker and isolator along with associated cabling, removal and replacement of one gantry and works to one existing pylon. All works would be within existing operational land.

11.1.5 Please refer to **Chapter 3: Description of the Project** and **Figures 1.1** and **1.2** for an overview of the different components of the Project.

Limitations and assumptions

11.1.6 The information provided in this Preliminary Environmental Information Report (PEIR) is preliminary, the final assessment of likely significant effects will be reported in the ES. The PEIR has been produced to fulfil National Grid Electricity Transmission PLC's (National Grid's) consultation duties and enable consultees to develop an informed view of the likely significant effects of the Project, and comment on this during statutory consultation, before the design of the Project is finalised and taken forward to submission of the application for development consent.

11.1.7 As described at scoping, the preliminary impact assessment has been undertaken by means of a desk study, utilising information from published sources.

11.1.8 The Project has been based on the principal that measures have been 'embedded' into the Project design to remove potential significant effects (**Section 4.6**), for example by the considered placement and choice of infrastructure. This approach is informed by the iterative design process. Additionally, the Project would ensure that standard good practice construction measures are adopted, through the implementation of an Outline Construction Environmental Management Plan (CEMP). The preliminary appraisal of potential effects therefore assumes that both design mitigation and good practice measures are in place.

11.1.9 There are no limitations relating to agriculture and soils that affect the robustness of the preliminary assessment of the potential likely significant effects of the Project.

11.2 Relevant legislation, planning policy and technical guidance

11.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to agriculture and soils. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and Policy Overview**.

Legislation

11.2.2 A summary of the relevant legislation is given in **Table 11.1**.

Table 11.1- Legislation relevant to the agriculture and soils assessment

Legislation	Legislative Context
The Town and Country Planning (Development Management Procedure) (England) Order 2015. ¹	Schedule 4, Part (y) requires that the local planning authority consults Natural England if the area of a proposed permanent development exceeds 20ha of best and most versatile (BMV) agricultural land.
The Agriculture Act, November 2020 ²	Chapter 1 New Financial Assistance Powers. The Secretary of State may give financial assistance for, or in connection with, protecting or improving the quality of soil.

Planning policy

11.2.3 A summary of the relevant national and local planning policy is given in **Table 11.2**.

Table 11.2 - Planning policy relevant to the agriculture and soils assessment

Policy	Policy Context
National planning policy	
Overarching National Policy Statement for Energy (EN-1) ³	Section 5: Land use including open space, green infrastructure and Green Belt Paragraph 5.10.8 provides policy direction for development on agricultural land and protection of soil resources, as applicable to the assessment and mitigation of impacts to these receptors. Requires that impacts on BMV agricultural land are minimised and

¹ Statutory Instrument 2015 No. 595, The Town and Country Planning (Development Management Procedure) (England) Order 2015. Available at: <https://www.legislation.gov.uk/ukxi/2015/595/contents/made> [Accessed 2 July 2021].

² The Agriculture Act (2020). Available at: <https://www.legislation.gov.uk/ukpga/2020/21/contents/enacted> [Accessed 2 July 2021].

³ Department for Energy and Climate Change (2011). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed 2 July 2021].

Policy	Policy Context
National Policy Statement for Electricity Networks Infrastructure (EN-5) ⁴	development directed towards non-agricultural land or land of poorer quality. Requires that any effects are identified and that the developer should seek to minimise impacts on soil quality taking into account any mitigation measures proposed. Paragraph 1.7.5 provides policy direction on the effects of development on soil resources relevant to the chapter requiring the effects on soil to be considered both in the short-term and long-term, taking into consideration the specific location and the sensitivity of the receiving environment. Paragraph 2.8.9 provides consideration of the relative impacts of underground cable as opposed to overhead lines.
National Planning Policy Framework (NPPF) ⁵	Paragraph 174 provides policy direction for development on agricultural land with respect to BMV land and ecosystem services. Paragraph 175 provides policy direction for development on agricultural land, as applicable to the assessment and mitigation of impacts to this receptor.
A Green Future: Our 25 Year Plan to Improve the Environment ⁶	Provides policy direction regarding the sustainable use of natural resources including protection of BMV land, restoration of peatland, and the sustainable management of soils.
Local planning policy	
Harrogate District Local Plan, 2014 – 2035 ⁷	Policy NE8: Protection of Agricultural Land Directs development towards non-agricultural land and land of lower agricultural quality (non-BMV). An overriding need for the development of BMV agricultural land must be proven. Sites of over five hectares which may affect BMV agricultural land should produce an Agricultural Land Classification (ALC) survey

⁴ Department for Energy and Climate Change (2011). National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37050/1942-national-policy-statement-electricity-networks.pdf [Accessed 2 July 2021].

⁵ Ministry of Housing, Communities and Local Government (2021). The National Planning Policy Framework (NPPF). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004408/NPPF_JULY_2021.pdf [Accessed 21 July 2021].

⁶ HM Government (2018). 'A Green Future: Our 25 Year Plan to Improve the Environment'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf (Accessed 5 July 2021).

⁷ Harrogate Borough Council (2020). Harrogate District Local Plan 2014 – 2035. Available at <https://www.harrogate.gov.uk/planning-policy-guidance/harrogate-district-local-plan-2014-2035> . Accessed 15 February 2021.

Policy	Policy Context
Hambleton Local Plan – Publication Draft, 2019 ⁸	<p>to determine the quality, quantity, and location of BMV agricultural land.</p> <p>Proposals for development should demonstrate that soil resources have been protected and used sustainably in line with best practice.</p>
Saved Policies of the York Local Plan, 2005 ⁹	<p>Policy S5: Development in the Countryside</p> <p>Minimise impacts on BMV agricultural land. Direct development towards non-agricultural land or land of poorer non-BMV quality. Where development of BMV agricultural land is unavoidable development to be directed to the lowest quality land available - except where other sustainability considerations outweigh agricultural land quality issues or where the benefits of the development justify the loss of BMV.</p> <p>Where agricultural land would be lost the proposal will be expected to be designed so as to retain as much soil resource as possible. Sterilisation of other agricultural land, for example by severing access to farmland is to be avoided.</p> <p>Policy GP14: Agricultural Land</p> <p>For development that would result in the loss of the BMV agricultural land, planning permission will only be granted if it can be clearly demonstrated that very special circumstances exist which determine that the proposal cannot be located elsewhere.</p>
City of York draft Local Plan – Publication Draft, 2018 ¹⁰ –	Reference is made to protection of agricultural land throughout the Local Plan, however no specific Policies for the protection of BMV agricultural land or soil resources are included.
Upper Poppleton and Nether Poppleton Neighbourhood Plan, 2016 - 2036 ¹¹	<p>Neighbourhood Plan and Policy PNP 8B</p> <p>Promote the development of brownfield sites as a priority over any greenfield site particularly those impacting BMV agricultural land.</p>

⁸ Hambleton District Council (2019), Hambleton Local Plan – Publication Draft. Available at: <https://www.hambleton.gov.uk/downloads/download/224/local-plan-submission-core-documents> Accessed 15 February 2021.

⁹ City of York Council (2005). Local Plan Incorporating the 4th Set of Changes (April 2005). Available at: <https://www.york.gov.uk/downloads/file/2822/the-local-plan-2005-development-control-local-plan-full-document-and-appendices> Accessed 15 February 2021.

¹⁰ City of York Council (2018). Local Plan – Publication Draft. Available at: <https://www.york.gov.uk/downloads/file/1314/cd001-city-of-york-local-plan-publication-draft-regulation-19-consultation-february-2018-> Accessed 15 February 2021.

¹¹ City of York Council (2017). Upper Poppleton and Nether Poppleton Neighbourhood Plan, 2016 – 2036. <https://www.york.gov.uk/downloads/file/2832/upper-and-nether-poppleton-neighbourhood-plan-submission-document-2016-> Accessed 15 February 2021.

Policy	Policy Context
<p>Minerals and Waste Joint Plan¹² (North Yorkshire County Council, York City Council, North York Moors National Park Authority) - at examination stage</p> <p>(Considered as policies relate to developments in which there is temporary disturbance to soils and agricultural land as for Underground Cable and Overhead Line.)</p>	<p>Policy D12: Protection of agricultural land and soils</p> <p>BMV agricultural land will be protected from unnecessary and irreversible loss. Where development is justified, protection and enhancement of soils and the long-term potential to recreate BMV agricultural land is prioritised.</p> <p>Where relevant, development will be subject to aftercare requirements and will be required to demonstrate that all practicable steps will be taken to conserve and manage on-site soil resources, including soils with environmental value, in a sustainable way. Development which would disturb or damage soils of high environmental value such as peat or other soil contributing to ecological connectivity or carbon storage will not be permitted.</p>
<p>Selby District Local Plan, 2005¹³</p>	<p>Policy EMP9: Expansion of existing employment uses in rural area</p> <p>Irreversible loss of BMV agricultural land will not be permitted unless there is an exceptional overriding need and there is no suitable alternative site available.</p> <p>Policy EMP11: Exceptional major industrial and business development</p> <p>Minimise the loss of BMV agricultural land</p>
<p>Selby District Core Strategy Local Plan, 2013¹⁴</p>	<p>Policy SP18: Protecting and Enhancing the Environment</p> <p>The high quality and local distinctiveness of the natural and manmade environment will be sustained by:</p> <p>(7) ensuring that new development protects soil, air and water quality from all types of pollution; and</p> <p>(9) steering development to areas of least environmental and agricultural quality.</p>
<p>Selby Draft Local Plan – Preferred options, 2021¹⁵</p>	<p>SG5: Development in the countryside:</p>

¹² North Yorkshire County Council, York City Council, North York Moors National Park Authority (2016). Minerals and Waste Joint Plan – Publication Draft. Available at: <https://www.northyorks.gov.uk/minerals-and-waste-joint-plan> Accessed 27 July 2021.

¹³ Selby District Council (2005). Selby District Local Plan. Available at: <https://www.selby.gov.uk/selby-district-local-plan-sdlp-2005> Accessed 15 February 2021.

¹⁴ Selby District Council (2013). Selby District Core Strategy Local Plan. Available at: https://www.selby.gov.uk/sites/default/files/Documents/CS_Adoption_Ver_OCT_2013_REDUCED.pdf Accessed 15 February 2021.

¹⁵ Selby District Council (2021). Selby District Council Local Plan Preferred Options Consultation 2021. Available at https://www.selby.gov.uk/sites/default/files/Local_Plan_PREFERRED_Options_29-01-2021_%28Web%20Version%29.pdf Accessed 15 February 2021.

Policy	Policy Context
	<p>Avoid irreversible loss of BMV agricultural land, where possible. Where BMV agricultural land is to be developed this is to be directed at land of the lowest possible Grade. Grade 1 agricultural land to be avoided unless there are exceptional circumstances where the benefits of the proposal significantly outweigh the loss of land.</p> <p>Proposals for development should demonstrate that soil resources have been protected and used sustainably in line with best practice.</p> <p>EM4: The Rural Economy</p> <p>Development in rural areas will be expected to protect areas of best quality agricultural land.</p>

Technical guidance

11.2.4 A summary of the technical guidance for agriculture and soils is given in **Table 11.3**.

Table 11.3 - Technical guidance relevant to the agriculture and soils assessment

Technical Guidance Document	Context
HM Government (2019) Planning Practice Guidance for the Natural Environment (PPGNE) ¹⁶ Paragraphs 001 and 002	Explains the need for planning decisions to take into account the value of soils and agricultural land to enable informed choices on the future use of soil resources and agricultural land within the planning system.
Natural England (2012) Technical Information Note 049 (TIN049): Agricultural Land Classification: Protecting the Best and Most Versatile agricultural land ¹⁷	Explains the Government Policy to protect agricultural land and the ALC system and uses.
Department for the Environment, Food and Rural Affairs (DEFRA) (2009): Construction Code of Practice for the Sustainable Use of Soil on Development Site ¹⁸	Provides relevant advice on the management of soil within construction projects.
Ministry of Agriculture, Fisheries and Food (MAFF) (1988): Agricultural Land Classification of England and Wales Revised	The Technical Guidance from MAFF provides revised guidelines and criteria for grading the quality of agricultural land.

¹⁶ HM Government (2019). Planning Practice Guidance for the Natural Environment. Available at: <https://www.gov.uk/guidance/natural-environment> Accessed 15 February 2021.

¹⁷ Natural England (2012). Technical Information Note 049, 'Agricultural Land Classification: protecting the Best and Most Versatile agricultural land'. Available at: <http://publications.naturalengland.org.uk/publication/35012> Accessed 15 February 2021.

¹⁸ DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf. Accessed 15 February 2021.

11.3 Consultation and engagement

Overview

- 11.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 4.4 of Chapter 4: Approach to Preparing the PEIR**.

Scoping opinion

- 11.3.2 A Scoping Opinion was adopted by the Secretary of State, administered by the Planning Inspectorate, on 28 April 2021. A summary of the relevant responses received in the Scoping Opinion in relation to agriculture and soils and confirmation of how these have been addressed within the assessment to date is presented in **Table 11.4**.
- 11.3.3 The information provided in the PEIR is preliminary and not all of the Scoping Opinion comments have been addressed at this stage, however all comments will be addressed within the ES, where appropriate.

Table 11.4 - Summary of EIA Scoping Opinion responses for agriculture and soils

Consultee	Consideration	How addressed in this PEIR
Planning Inspectorate	In addition to the Meteorological Office guidance Climatological Data for Agricultural Land Classification (1989), the ES should be informed by the Met Office UK National Climate Projections (UKCP18) in order that forecasts of long-term changing climatic conditions can be taken into account.	Noted.
Planning Inspectorate	Information gathered for the agriculture and soils chapter should inform the cultural heritage assessment, eg in relation to potentially sensitive paleo environmental and peat deposits.	Where relevant, information will be shared between agriculture and soils and the cultural heritage assessment. Presently, there is no evidence of peat deposits or peaty soils in the available published data covering the draft Order Limits. Should peat deposits or

¹⁹ MAFF (1988). Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. Available at <http://publications.naturalengland.org.uk/publication/6257050620264448>. Accessed 5 July 2021.

Consultee	Consideration	How addressed in this PEIR
Planning Inspectorate	In addition to the measures outlined, the ES should consider the use of temporary ground protection mat systems for vehicle tracking across the most sensitive soils.	peaty soils be identified, data will be shared. This has been incorporated as a mitigation measure and is referred to in Table 11.12 .
Hambleton District Council	The permanence of structures, such as haul roads, the impacts of which are assessed as being temporary structures, but which then remain in place following construction (for example to benefit of the landowner).	Throughout the design phase of the Project, there will be ongoing negotiations between the Project's Lands Team and landowners – including any structures which the landowner may wish to retain post construction. Prior to finalising the ES, the temporary or permanent nature of such structures will be confirmed for inclusion in the impact assessment (loss of agricultural land). Additionally, a DCO only permits development as assessed. Therefore, if a structure (e.g. haul road) is assessed within the ES as being temporary it cannot be retained (made permanent) unless a separate permission is sought by the landowner.
Natural England	Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile (BMV) agricultural land as set out in paragraph 170 of the NPPF*. We also recommend that soils should be considered in the context of the sustainable use of land and the ecosystem services they provide as a natural resource, as also highlighted in paragraph 170 of the NPPF*.	The relevant paragraph of the NPPF is referenced in Section 11.2 . An assessment of the amount of BMV land present has been undertaken and used as the basis of impact assessment. Protection of the structure and function of soil resources (hence their ability to provide essential ecosystem services) has been assessed and suitable mitigation provided where required.

Consultee	Consideration	How addressed in this PEIR
Natural England	Soil is a finite resource that fulfils many important functions and services (ecosystem services) for society, for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. It is therefore important that the soil resources are protected and used sustainably.	The assessment methodology considers impacts to the soil resource in terms of potential for disturbance/damage and loss. The impact assessment focusses on the protection of soil resources and their sustainable reuse.
Natural England	The applicant should consider the following issues as part of the Environmental Statement: The degree to which soils are going to be disturbed/harmed as part of this development and whether 'best and most versatile' agricultural land is involved.	The assessment methodology considers the amount of BMV land impacted by the Project and impacts to the soil resource in terms of potential for disturbance/damage and loss.
Natural England	This may require a detailed survey if one is not already available. For further information on the availability of existing agricultural land classification (ALC) information see www.magic.gov.uk . Natural England Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land also contains useful background information.	The PEIR details the ALC data available on magic.gov.uk and references TIN49, as will be the case for the ES. Detailed survey of areas of permanent infrastructure is planned – access permitting. A desk-based analysis is proposed for areas of temporary development.
Natural England	If required, an agricultural land classification and soil survey of the land should be undertaken. 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	The methodology for baseline ALC data collection proposes that areas of permanent development (substations and CSEC are subject to detailed soil/ALC survey. Data for other areas (including pylon locations) are gathered using a desk-based methodology (with a commitment to targeted surveys being undertaken post-consent when

Consultee	Consideration	How addressed in this PEIR
Natural England	of the soil resource, i.e. 1.2 metres.	the precise routing and placement of infrastructure are known, ensuring the surveys are targeted to areas directly impacted by the Project).
Natural England	The Environmental Statement should provide details of how any adverse impacts on soils can be minimised. Further guidance is contained in the Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites ²⁰ .	Defra Construction Code of Practice for the Sustainable Use of Soil on Development Sites ²⁰ is used as the preferred referenced text for the identification of suitable soil management and mitigation measures.
Natural England	As identified in the NPPF* new sites or extensions to new sites for peat extraction should not be granted permission by Local Planning Authorities or proposed in development.	No peat deposits or peaty soils are identified in the available published data which fall within the draft Order Limits. Should peat deposits or peaty soils subsequently be identified impacts to these areas would be avoided, where practicable, in line with the requirements of other disciplines and engineering constraints.
North Yorkshire County Council	Supportive of the approach put forward at Scoping. A soil survey, assessment and management plan are needed in order to protect and manage site soils, including protection and restoration of ALC best and most versatile land where appropriate.	Surveys of areas of permanent development (excluding pylon locations) will be undertaken. In all other locations a desk-based assessment will be completed to determine ALC grades. Provision of appropriate soil management measures are integral to the assessment and associated reporting. This would ensure soils are retained at a quality where restoration to pre-development ALC status is possible. Where practicable, and in line with the requirements of other disciplines and engineering

²⁰ DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf Accessed 30 June 2021.

Consultee	Consideration	How addressed in this PEIR
		factors, impact to BMV land would be minimised.

*When Natural England's scoping response was issued in April 2021 the current version of the NPPF was dated 2019; an update to the NPPF was subsequently issued in July 2021⁵, as referenced in **Table 11.2**. The 2021 update made no change to policy requirements regarding soils and agricultural land, and the text remained unaltered; however, paragraph numbers were updated with paragraph 170 of the NPPF 2019 becoming paragraph 174 of the NPPF 2021 and so on.

Technical engagement

- 11.3.4 It has not been necessary to hold specific technical meetings or discussions in relation to Agriculture and Soils to date. This requirement will be reviewed prior to production of the ES and technical engagement meetings will be held if necessary to develop or discuss the technical assessments.
- 11.3.5 There will however be ongoing communication between the Project's Lands Team and farmers and landowners throughout the planning process. The site-specific information gained will assist in defining the routeing and micro-siting of infrastructure; and in describing site specific (bespoke) mitigation, if required.

11.4 Data gathering methodology

Study area

- 11.4.1 For the purpose of establishing the baseline conditions for the Agriculture and Soils assessment, the Study Area comprises the draft Order Limits, as defined in **Chapter 2: Description of the Project** and shown on **Figure 11.1**; as this describes the full extent of the Project. As well as areas of proposed infrastructure and land associated with its delivery; the draft Order Limits also include existing overhead lines for which works such as replacement of existing overhead conductors, replacement of pylon fittings, strengthening of steel work and works to pylon foundations will form part of the Project (see **Section 11.1**). Existing substations (Monk Fryston Substation and Osbaldwick Substation) are also included within the draft Order Limits as works will be required at these substations as part of the Project. No buffer was applied as impacts to soils and agricultural land only occur on land that would be directly impacted by the Project. As outlined in **Section 3.2** the proposed infrastructure within the draft Order Limits falls into three distinct areas (**Figure 1.2**):
- NorthWest of York;
 - Tadcaster; and
 - Monk Fryston.
- 11.4.2 **Section 3.2** also provides a description of the locations of existing infrastructure within the draft Order Limits.
- 11.4.3 The Project design will be refined in response to feedback received through the statutory consultation process, ongoing baseline data collation and ongoing consultation with landowners. The draft Order Limits may therefore change and evolve between PEIR and final submission of the DCO application.

11.4.4 Once statutory consultation is complete and a design freeze is in place for the DCO application, the ES will present a more detailed assessment of the areas of temporary and permanent loss of agricultural land as a result of the Project.

Desk study

11.4.5 A summary of the organisations that have supplied data, together with the nature of those data is outlined in **Table 11.5**.

Table 11.5 - Data sources used to inform the agriculture and soils assessment

Organisation	Data Source	Data Provided
The Soil Survey of England and Wales	Soils and their Use in Northern England and accompanying 1:250,000 map Sheet 1 ²¹ .	Mapped soil associations and details of soil characteristics.
MAFF (now Defra)	Provisional ALC 1:250,000 mapping Yorkshire and The Humber (ALC003) ²² .	Mapped ALC distributions - agricultural land quality data.
Natural England	Likelihood of Best and Most Versatile (BMV) Agricultural Land - Strategic scale map Yorkshire and The Humber (ALC015) ²³ .	1:250,000 scale mapping predicting the likelihood of BMV agricultural land.
Google	Google Maps incorporating Streetview ²⁴ .	Aerial and street level imaging of the Project.
Department of the Environment, Farming and Rural Affairs (Defra)	The Government's geographic information website: Multi-Agency Geographical Information for the Countryside MAGIC.gov.uk ²⁵ .	Administrative area boundaries, Provisional and Post-1988 ALC data, and aerial imaging available to view digitally and overlay.
Cranfield University (Knox <i>et al.</i>)	Report: Research to develop the evidence base on soil erosion and water use in agriculture ²⁶ .	Soil erosion criteria to inform soil sensitivity classifications.
MAFF	Agricultural Land Classification detailed Post 1988 ALC	Detailed ALC data for some land within the Study Area.

²¹ Soil Survey of England and Wales (1984). Soils and their Use in Northern England and accompanying 1:250,000 map Sheet 1. (Not available digitally).

²² MAFF (1993). 1:250,000 Provisional Agricultural Land Classification Sheet, Yorkshire and the Humber (ALC003). Available at:

<https://data.gov.uk/dataset/952421ec-da63-4569-817d-4d6399df40a1/provisional-agricultural-land-classification-alc> Accessed 30 June 2021

²³ Natural England (2017) Likelihood of Best and Most Versatile (BMV) Agricultural Land - Strategic scale map Strategic scale map Yorkshire and The Humber (ALC015) Available at:

<http://publications.naturalengland.org.uk/publication/5093223992655872?category=5208993007403008> Accessed 30 June 2021

²⁴ Google Maps incorporating Google Streetview. <https://www.google.com/maps>. Accessed 30 June 2021

²⁵ HM Government. Multi-Agency Geographical Information for the Countryside (MAGIC) available online @ www.magic.gov.uk Accessed 30 June 2021.

²⁶ Cranfield University, Knox *et al.* (2015). 'Research to develop the evidence base on soil erosion and water use in agriculture: Final Technical Report. pp147'. Available at <https://www.theccc.org.uk/wp-content/uploads/2015/06/Cranfield-University-for-the-ASC.pdf> Accessed 30 June 2021

Organisation	Data Source	Data Provided
	survey, Ferrybridge To Hook Moor A1(M) (ALCL06390) ²⁷	
MAFF	Agricultural Land Classification detailed Post 1988 ALC survey, Bramham, Bramham Moor (Leeds UDP) (ALCL09895) ²⁸	Detailed ALC data for some land within the Study Area.
MAFF	Agricultural Land Classification detailed Post 1988 ALC survey, Shipton by Beningbrough Bypass (ALCL13391) ²⁹	Detailed ALC data for some land within the Study Area.
Defra	Agricultural Land Classification detailed Post 1988 ALC survey, York: Poppleton, Skelton, North Of A59 To Rawcliffe (York City LP) (ALCL07698) ³⁰	Detailed ALC data for some land within the Study Area.
Cranfield University	Climatological Data for Agricultural Land Classification ³¹	Agroclimatic data to inform ALC.

11.4.6 As described at Scoping, the collection of the baseline Agriculture and Soils data for the PEIR has been desk based. The determination of ALC grading has been undertaken following a methodology which was previously agreed by Natural England for use on other linear Electricity Infrastructure Projects.

11.4.7 The 1:250,000 scale Provisional ALC mapping²² is the most current and detailed published ALC data covering the entire Study Area. However, it is important to note that this data pre-dates the revised ALC methodology issued in 1988¹⁹ and as a result, the data does not provide a distinction between ALC Subgrades 3a (BMV) and 3b (non-BMV). The Provisional ALC mapping therefore provides an indication of the land quality in the Region, but the extent and distribution of BMV agricultural land within the Study Area cannot be defined from the Provisional mapping alone.

11.4.8 There are also discrete areas covered by detailed survey data known as Post-1988 surveys^{27,28,29,30}. These data post-date the revised ALC methodology, and as such provide accurate ALC grading at the field scale including a distinction between ALC Subgrades 3a (BMV) and 3b (non-BMV). Where available, these data have been used

²⁷ MAFF (1998) 'Agricultural Land Classification detailed Post 1988 ALC survey, Ferrybridge To Hook Moor A1(M) (ALCL06390) Available at: <http://publications.naturalengland.org.uk/publication/5898163461292032> Accessed 28 July 2021

²⁸ MAFF (1995) 'Agricultural Land Classification detailed Post 1988 ALC survey, Bramham, Bramham Moor (Leeds UDP)' (ALCL09895) Available at: <http://publications.naturalengland.org.uk/publication/5942294218276864> Accessed 30 June 2021

²⁹ MAFF (1991) 'Agricultural Land Classification detailed Post 1988 ALC survey, Shipton by Beningbrough Bypass' (ALCL13391) Available at: <http://publications.naturalengland.org.uk/publication/4662146297233408> Accessed 30 June 2021

³⁰ Defra (2009) Agricultural Land Classification detailed Post 1988 ALC survey, York: Poppleton, Skelton, North Of A59 To Rawcliffe (York City LP) (ALCL07698) Available at: <http://publications.naturalengland.org.uk/publication/4627196472197120> Accessed 30 June 2021

³¹ Cranfield University (2013). Climatological Data for Agricultural Land Classification <https://data.gov.uk/dataset/8a334958-ff65-4f5c-9674-5a85e61ee269/climatological-data-for-agricultural-land-classification> Accessed 30 June 2021

in the determination of the ALC. Both the Post-1988 data and Provisional ALC data are available on the Government's geographic information website²⁵.

- 11.4.9 For areas where detailed Post-1988 data are not available, the Provisional ALC Mapping has been used to directly determine the proportions of ALC Grades 1, 2, 4 and 5. In a change to the methodology presented in the Scoping Report, for areas Provisionally mapped as Grade 3, the relative proportions of Subgrade 3a and 3b have been calculated using Natural England's Likelihood of BMV Agricultural Land mapping²³; also known as Predictive ALC mapping. The methodology put forward at Scoping proposed that the Subgrade 3a/3b subdivision would be calculated based on the standard ALC methodology¹⁹ using soil data provided by the Soil Survey of England and Wales²¹ in conjunction with available agroclimatic data³¹. The Predictive ALC mapping was produced by Natural England using a methodology very similar to that proposed at Scoping and therefore these universally accepted published data are used in preference to undertaking specific calculations for the Study Area.
- 11.4.10 The Predictive ALC data²³ spatially map the percentage chance (likelihood) of BMV land occurring within a particular area. The Predictive mapping was devised by Natural England based on soil association data from the 1:250,000 scale national soil map²¹. The methodology assessed each soil association on a regional basis using standard ALC guidelines¹⁹. The published ALC data used in the assessment were taken from detailed site surveys, where available, and the Provisional ALC mapping data; along with agroclimatic data³¹.
- 11.4.11 The data provide the likely proportion of BMV agricultural land to be encountered, using the following categories:
- High Likelihood: Areas where more than 60% of the land is likely to be BMV;
 - Moderate Likelihood: Areas where 20% to 60% of the land is likely to be BMV; and
 - Low Likelihood: Areas where less than 20% of the land is likely to be BMV.
- 11.4.12 For the purpose of this assessment and to provide a robust quantification of the area of BMV land within the Study Area, land mapped as High Likelihood has been considered as Subgrade 3a; whereas land mapped as Low Likelihood has been considered as Subgrade 3b. The land mapped as Moderate Likelihood has been split 50/50 between Subgrades 3a and 3b.
- 11.4.13 The combination of the areas identified as High Likelihood of BMV and 50% of the areas identified as Moderate Likelihood of BMV land²⁶ (mapped as Grade 3 on the Provisional mapping); and the Provisionally mapped ALC Grade 1 and 2 land, have therefore, in conjunction with the detailed Post 1988 survey data, been used to provide the total potential area of BMV within the Study Area.
- 11.4.14 It is noted that the relative proportions of Subgrade 3a and 3b within the Study Area could only be presented in a tabular form and not represented in a mapped format (due to the 50/50 split of the Moderate Likelihood of BMV land). The lack of spatial information does not affect the reporting or impact assessment as this considers the total permanent loss of BMV land for the Project as a whole.
- 11.4.15 Within the PEIR, the presented soils data are taken from Soil Survey of England and Wales²¹ and from the soil survey data provided in the four available Post-1988 survey datasets^{27,28,29,30}. Data on the erodibility of Soil Associations²⁶ has been used to identify potential areas of increased soil sensitivity for the impact assessment. The sensitivity

data will also be used to inform the iterative design process, so that areas of high sensitivity can be avoided where practicable.

- 11.4.16 This methodology of applying a desk-based approach to the gathering of baseline soils and ALC data has been used in other National Grid linear projects such as Viking Link (an interconnector from Denmark with 60km underground cable through Lincolnshire). The methodology ensures that the baseline is adequately described to ensure that all potentially significant effects are identified, allowing a thorough and robust impact assessment to be undertaken.

Survey work

- 11.4.17 No survey work has been undertaken to date. However, it is proposed that for areas of permanent development excluding new and replacement pylon locations i.e. substations, CSEC, baseline soils and ALC data will be collected through detailed survey to current guidelines¹⁹ prior to ES production, where possible; see **Section 11.12**.

11.5 Overall baseline

Current baseline

Agricultural land

- 11.5.1 The Provisional ALC data identify the land within the Study Area as comprising Grade 2, Grade 3 and Grade 4 agricultural land, as well as non-agricultural and urban land classifications (as shown in **Figure 11.1**). **Table 11.6** identifies the proportion per Provisional ALC Grading within the Study Area.
- 11.5.2 The spatial distribution of the ALC grades, shown in **Figure 11.1**, identifies that Grade 2 agricultural land is located along the majority of the southern part of the Study Area from Long Marston to Monk Fryston; whereas Grade 3 agricultural land is identified in the northern part of the Study Area from north of Long Marston to Shipton, and to the east of York in the Study Area around Osbaldwick Substation. A corridor of Grade 3 agricultural land is also identified to the north of Tadcaster, running north-west to south-east, broadly following the route of the River Wharfe. Small distinct areas of Grade 4 and non-agricultural land are mapped throughout the Study Area.
- 11.5.3 As described above, discrete areas of the Study Area are covered by detailed survey data known as Post-1988 surveys. Both the Provisional and Post-1988 data are available on the Government's geographic information website, [Magic.gov.uk](https://www.magic.gov.uk)²⁵. In total 54.35ha of land within the Study Area has been subject to Post-1988 survey (**Table 11.6**). The surveyed land comprises 29.11ha of BMV (Grades 1, 2 and Subgrade 3a) and 14.41ha of non-BMV (Subgrade 3b), with all remaining land, 10.84ha, in the surveyed areas being classified as 'other' (non-agricultural land, for example woodland, highways, built structures and other non-agricultural development). For the Post-1988 data within the Study Area, the areas mapped as Subgrade 3a and Subgrade 3b are roughly equal (51.3% versus 48.7%).
- 11.5.4 The Post-1988 surveys therefore identify 66.9% of the surveyed agricultural land (i.e. discounting the non-agricultural land incorporated in the survey areas) as being of BMV quality. However, it is worth noting that these surveys are regularly targeted to areas where BMV land (rather than non-BMV land) is thought to be present in order to identify the distribution of BMV land in more detail. The locations of the surveys within the Study

Area largely correspond with higher ALC graded land in the wider area as identified in the Provisional mapping. The spatial distribution of the ALC grades, based on the Provisional data supplemented with Post 1988 data, where available, is shown in **Figure 11.1**. The Post-1988 survey data for the Study Area is described in the following paragraphs.

- 11.5.5 Post-1988 survey data collated by MAFF to inform the upgrading of the A1 between Hook Moor and Ferrybridge²⁷ is just clipped by the Study Area around Junction 42 with the A63, to the west of Monk Fryston (**Figure 11.1**, specifically **sheet 6**). These data identify Subgrade 3b.
- 11.5.6 The Post-1988 survey data collated by MAFF in 1995 to inform the Leeds Unitary Development Plan (Bramham, Bramham Moor²⁸) identify land within the centre of the Study Area, on a spur west of the A695, to be predominantly of BMV quality (Grade 2 and Subgrade 3a, with a very small area of Grade 1 adjacent Warren Lane). Subgrade 3b agricultural land is located to the west of this area (**Figure 11.1**, specifically **sheet 4**).
- 11.5.7 The Post-1988 survey data collated by MAFF in 1991 to inform the development of the Shipton by Beningbrough Bypass²⁹, identify land within the north of the Study Area between Shipton and Skelton, as Grade 2, Subgrade 3a and Subgrade 3b agricultural land; with an area of non-agricultural land identified on aerial mapping²⁴ as woodland and scrub (**Figure 11.1**, specifically **sheet 1**).
- 11.5.8 The Post-1988 survey data collated by Defra in 2009 to inform the future development of the City of York within the confines of the ringroad³⁰, identify the discrete section of the Study Area to the east of York as being predominantly non-agricultural land (Osbalwick Substation) with Grade 2 agricultural land along the eastern boundary (**Figure 11.1**, specifically **sheet 7**).
- 11.5.9 **Table 11.7** identifies the ALC grading of land within the Study Area based on a combination of the Provisional and Post-1988 ALC data.

Table 11.6 - Provisional ALC grading within the Study Area

ALC Grade	Area within the Study Area (ha)	Percentage within the Study Area (%)
Grade 2	464.0	46.9
Grade 3	496.9	50.2
Grade 4	26.7	2.7
Non-Agricultural	1.5	0.1
Total	989.1	100.0

Table 11.7 - Provisional ALC grading supplemented with Post-1988 ALC grading within the Study Area

ALC Grade	Area within the Study Area (ha)	Percentage within the Study Area (%)
Grade 1 (Post-1988)	1.7	0.2
Grade 1 (Provisional)	0.9	0.1
Grade 2 (Post-1988)	12.2	1.2
Grade 2 (Provisional)	436.2	44.1
Grade 3a (Post-1988)	15.2	1.5
Grade 3b (Post-1988)	14.4	1.5
Grade 3 (Provisional)	469.5	47.5
Grade 4 (Provisional)	26.7	2.7
Non Agricultural (Post-1988)	10.8	1.1
Non Agricultural (Provisional)	1.4	0.1
Total	989.1	100.0

(934.7 ha of the Study Area not subject to a Post-1988 survey)

- 11.5.10 From the Provisional and Post-1988 data (and assuming a 50/50 division of the Provisionally mapped Grade 3 land onto Subgrade 3a/3b) nearly three quarters of the land within the Study Area is classified as BMV agricultural land (72.0%, see **Table 11.7**).
- 11.5.11 The Predictive ALC²³ for the Study Area is shown in **Figure 11.2** and presented in **Table 11.8**. These data show that all the agricultural land within the Study Area has a high (50.2% of the Study Area) or moderate (48.7% of the Study Area) likelihood of being BMV quality, with the remaining land being non-agricultural or urban/industrial.

Table 11.8 - Predictive ALC in the Study Area

ALC Grade	Area within the Study Area (ha)	Percentage within the Study Area (%)
High likelihood of BMV land (>60 % area BMV)	496.8	50.2
Moderate likelihood of BMV land (20 - 60 % area BMV)	481.9	48.7
Low likelihood of BMV land (<= 20 % area BMV)	0.0	0.0
Non-agricultural use	0.7	0.1

ALC Grade	Area within the Study Area (ha)	Percentage within the Study Area (%)
Urban/Industrial	9.6	1.0
Total	989.1	100.0

11.5.12 As per the methodology set out in **Section 11.4**, the ALC gradings for the Study Area have been calculated using a combination of the available Post-1988 survey data^{27,28,29,30} and the Provisional ALC dataset²² (see **Figure 11.1**) to define areas of Grade 1, 2 and 4 land; and the Predictive ALC dataset²³ to provide the Subgrade 3a:Subgrade 3b subdivision for the land Provisionally mapped as Grade 3. The calculated ALC gradings (**Table 11.9**) and show that 713.8ha (72.2%) of the agricultural land within the Study Area is calculated to be BMV quality; and 258.8ha (36.3%) is calculated to be of non-BMV quality. The remaining land is considered to be under non-agricultural land uses. Therefore, it is considered that the Project would likely impact BMV agricultural land.

11.5.13 It is noted that there is a difference in the area of non-agricultural land calculated from the Provisional²² and Post-1988 survey datasets^{27,28,29,30} (see **Table 11.7**) and that calculated from these data sets in combination with the Predictive mapping²³ (see **Table 11.9**). This is due to some of the land which is Provisionally mapped²² as Grades 2 and 3, being reclassified by Natural England as 'non-agricultural' or 'urban/industrial'²³. This is likely a consequence of development (loss) of agricultural land which has occurred between the production of the Provisional data (prior to 1988) and the Predictive data (2017); and the fact that the Provisional data does not map changes in land use of less than 80ha, whereas the Predictive mapping is more accurate in this assessment.

Table 11.9 - Calculated ALC grading for the Study Area

ALC Grade	Area within the Study Area (ha)	Percentage within the Study Area (%)
Grade 1 (BMV)	2.6	0.3
Grade 2 (BMV)	445.6	45.1
Subgrade 3a (BMV)	265.6	26.9
Subgrade 3b (non-BMV)	232.1	23.5
Grade 4 (non-BMV)	26.7	2.7
Non-agricultural/Urban/Industrial	16.5	1.7
Total	989.1	100.0
Total BMV	713.8	72.2

Soil Resources

11.5.14 The soils identified by the Soil Survey of England and Wales²¹ as being present within the Study Area are listed within **Table 11.10** and shown in **Figure 11.3**. Erodibility data are taken from research by Cranfield University²⁶.

Table 11.10 - Soils within the Study Area of the Project

Soil Association	General Description	Erodibility²⁶
Osballdwick Substation (listed north to south)		
Newport (551d)	Deep well drained sandy and coarse loamy soils. Some sandy soils affected by groundwater. Risk of wind and water erosion.	Very High Risk (Water and also wind).
Foggathorpe 2 (712i)	Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Some similar coarse loamy over clayey soils.	Very Small Risk (Water).
North West of York to Tadcaster Areas (listed north to south)		
Foggathorpe 2 (712i)	Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Some similar coarse loamy over clayey soils.	Very Small Risk (Water).
Everingham (821a)	Deep stoneless permeable fine sandy soils some with bleached subsurface horizon. Groundwater controlled by ditches. Risk of wind erosion.	High Risk (Wind).
Blackwood (821b)	Deep permeable sandy and coarse loamy soils. Groundwater controlled by ditches.	Small Risk (Wind).
Enborne (811a)	Deep stoneless fine loamy and clayey soils variably affected by groundwater. Flat land. Risk of flooding.	Very Small Risk (Water).
Escrick 2 (571q)	Deep well drained often reddish coarse loamy soils. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging.	Moderate Risk (Water).
Bishampton (572s)	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with well drained fine and coarse loamy soils in an undulating landscape.	Moderate Risk (Water).
Dunkeswick (711p)	Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils associated with similar clayey soils.	Very Small Risk (Water).
Wharfe (561a)	Deep stoneless permeable fine loamy soils over river alluvium. Some similar soils variably affected by groundwater. Occur on flat land. Risk of flooding.	Moderate Risk (Water).
Wick 1 (541r)	Deep well drained coarse loamy and sandy soils locally over gravel. Some similar soils affected by groundwater.	Moderate Risk (Water, but also wind).

Soil Association	General Description	Erodibility ²⁶
Tadcaster to Monk Fryston Areas (listed north to south)		
Aberford (511a)	Shallow, well drained calcareous fine loamy soils over limestone. Some deeper calcareous soils in colluvium	Small Risk (Water).
11.5.15	Within the Study Area eleven distinct soil associations are mapped ²¹ , with the majority of soil variation along the route identified in the North West of York to Tadcaster Areas (between Tadcaster and Moor Monkton).	
11.5.16	Nine soil associations are mapped between Tadcaster and Moor Monkton ²¹ . The Dunkeswick, Foggathorpe 2, Enborne and Blackwood associations are all identified to be at very small to small risk of erosion from water ²⁶ . The Bishampton, Wharfe and Escrick 2 soil associations were identified to be at moderate risk of erosion from water. The Wick 1 association was also identified to be at moderate risk of erosion from water, and also at risk of wind erosion, albeit this association only covers a very small area (1.4ha). The Everingham association was identified as being at high risk of erosion from wind, but again this is only mapped as covering a very small and discrete area (0.2ha) which occurs along a proposed access route west of North Hall Moor.	
11.5.17	The soil survey which accompanied the Post-1988 survey of the Shipton by Benningbrough Bypass ²⁹ was undertaken in an area mapped as belonging to the Foggathorpe 2 association (typically clayey and fine loamy over clayey soils). The ALC report describes the surveyed soils as ranging from fine or medium sandy loams to medium and heavy clay loams – reflecting the localised (field scale) variations in soil type which are not picked up by the large-scale data. However, the majority of the soils described are consistent with the Foggathorpe 2 association.	
11.5.18	One soil association, Aberford (511a) is mapped within the Study Area between Monk Fryston and Tadcaster comprising shallow fine loamy soils over limestone with a small risk of erosion from water ²⁶ . There are two Post-1988 survey areas ^{27,28} located within this section of the Study Area. Both surveys identified medium textured shallow soils over limestone, largely consistent with the Aberford association classification.	
11.5.19	The discrete section of the Study Area around Osbaldwick Substation is mapped as including two soil associations. The Foggathorpe 2 association is identified to the south and is classed as being at very small risk of erosion from water; the Newport association is identified to the north and is classed as being at very high risk of erosion from water and also from wind. The soil survey conducted for the Post-1988 survey of this area ³⁰ confirmed the presence of both clay soils (akin to the Foggathorpe 2 association) and light sandy soils (akin to the Newport association), although the distribution and extent of the soil types was not mapped. However, it should be noted that all groundworks will be located on areas of existing hardstanding inside the existing Osbaldwick substation. Additionally, although there will be a requirement to access the existing adjacent pylon (which is mapped as being on Newport soils), the access will not require the development of a stoned track (it is likely that trackway panels will be used to protect the soils/ land surface) and therefore will not require the stripping of soil resources. The existing pylon is to be upgraded rather than replaced, therefore there will be no disturbance to the highly sensitive Newport soils.	
11.5.20	The extent of each of the mapped soil associations within the Study Area is shown on Figure 11.3 and in Table 11.11 . It is noted that 3.29ha of land is mapped as urban and no soil association data are provided. It is further noted that the figure for urban land	

differs from that quoted for the calculated ALC data, again this is due both to the large scale of the soils data and the development (loss) of agricultural land / soil resources which has occurred between the production of the Soils mapping²¹ (1984) and the Predictive ALC dataset²³ (2017) which is more accurate in this assessment.

Table 11.11 - Percentage of Study Area covered by each soil association

Soil Association	Area (ha)	Percentage (%)	Erodibility²⁶
Newport (551d)	1.4	0.1	Very High Risk (Water and also wind).
Everingham (821a)	0.2	0.0	High Risk (Wind).
Escrick 2 (571q)	30.1	3.0	Moderate Risk (Water).
Bishampton (572s)	71.4	7.2	Moderate Risk (Water).
Wick 1 (541r)	1.4	0.1	Moderate Risk (Water, but also wind).
Wharfe (561a)	3.7	0.4	Moderate Risk (Water).
Blackwood (821b)	6.8	0.7	Small Risk (Wind).
Aberford (511a)	349.6	35.3	Small Risk (Water).
Enborne (811a)	12.5	1.3	Very Small Risk (Water).
Dunkeswick (711p)	52.9	5.3	Very Small Risk (Water).
Foggathorpe 2 (712i)	454.3	45.9	Very Small Risk (Water).
Urban	4.9	0.5	-
Total	989.1		

11.5.21 The data show the Study Area to be dominated by two soil associations; the Foggathorpe 2 association (45.9%) which is situated to the north of the Study Area and the Aberford association (35.3%) which is situated to the south of the Study Area. These soils are at very small and small risk of erosion, respectively.

Land use

- 11.5.22 A reconnaissance survey of the Study Area was initially proposed, in order to provide an overview of the current land use and characteristics of the agricultural land present. However, this was not undertaken due to the current Covid-19 pandemic, and information regarding current land use has been informed by the use of aerial and ‘Streetview’ imaging provided by Google²³; as well as the author’s knowledge and experience of land use in the Study Area.
- 11.5.23 The majority of the Study Area has been identified to be in arable production; this finding corroborates the ALC data presented above, as higher quality (BMV) agricultural land is more productive and better suited to arable use than land of lower quality. The arable land is interspersed with permanent pasture and some small to medium woodlands and plantations. Areas of agriculture throughout the Study Area show zones of bare ground within fields, indicating areas potentially impacted by droughtiness and/or wetness which are impacting on crop growth.

Future baseline

- 11.5.24 At this stage of the Project the information obtained by National Grid is considered to be preliminary, and more detailed and location specific information will be gathered as the Project develops. Proposed further survey work is discussed in **Section 11.12**.
- 11.5.25 The baseline presented in this chapter also has the potential to change due to other new developments within the vicinity of the Project. New developments which are lodged within the planning system (or as otherwise agreed with the Planning Authorities), would be addressed via an assessment of cumulative effects within the ES.
- 11.5.26 Changes to the agriculture baseline as a result of natural processes and systems are slow to evolve, taking tens of years or more to develop. Therefore, there is little likelihood of such changes occurring during the construction phase of the Project.
- 11.5.27 However, it is acknowledged that during the predicted operational lifespan of the Project the baseline has the potential to alter due to changes in land use and farming practice. This may include, but is not limited to, the adoption or surrender of Agri-Environmental Schemes (it being noted that under the Agriculture Act 2020² there is an emphasis towards incentivising landowners to better protect and improve soils); shifts from arable agriculture to pasture, or *vice versa*; and implementation of field drainage schemes. Changes to the baseline may therefore be positive or negative.
- 11.5.28 There is the potential for long-term changes to the baseline due to climate change. These could potentially lead to alterations in agricultural land quality (ALC grade), for example through increased levels of soil wetness in the winter and increased droughtiness in the summer. This may in turn influence extent and location of BMV agricultural land. Changes in rainfall may also affect decomposition rates and soil organic matter content.
- 11.5.29 Although there is the potential for the baseline presented in this chapter and the final ES submission to change over time, it is considered that the data presented provides a good representation of land use and agricultural conditions at this stage of the Project.

11.6 Embedded measures

11.6.1 A range of environmental measures have been embedded into the Project as outlined in **Chapter 3: Description of the Project. Table 11.2** outlines how these embedded measures would influence the agriculture and soils assessment.

Table 11.12 - Summary of the embedded environmental measures

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
Construction			
Agricultural Land	Permanent loss of agricultural land including BMV. May be direct loss as a consequence of built infrastructure, or indirect through permanent change to non-agricultural use to facilitate these developments.	As part of the route design ³² - the location of permanent development on non-agricultural land in preference to agricultural land; and on land of lower quality where agricultural land could not be avoided; where practicable and taking into account technical and other environmental considerations.	Works plans accompanying DCO application.
Agricultural Land	Temporary loss of agricultural land including BMV.	As part of the route design ³² - the location of development on non-agricultural land in preference to agricultural land; and on land of lower quality where agricultural land could not be avoided; where practicable and taking into account technical and other environmental considerations.	Works plans.
Agricultural Land	Temporary loss of agricultural land including BMV.	Where temporary landtake occurs on agricultural land, land would be reinstated to the same quality (same ALC grade) or	Outline CEMP, secured via DCO requirement, and works plans. Soil Management Plan to form part of the Outline

³² National Grid, March 2021, Yorkshire GREEN Project, Corridor and Preliminary Routeing and Siting Study

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
		better and would be returned to agricultural use. Facilitated by the correct management of the supporting soil resources.	CEMP, secured via DCO requirement, and works plans.
Soil Resources	Damage to and loss of soil resources.	Adoption of industry standard methods for the handling and storage of soils; based on Defra's current good practice guidelines ¹⁸ , standard working methods and techniques used to protect soil resources.	Soil Management Plan to form part of the Outline CEMP, secured via DCO requirement.
		Use of trackway panels rather than stoned roads to access construction areas, where practicable, would minimise the stripping and handling of soil resources.	Outline CEMP, secured via DCO requirement.

11.7 Scope of the assessment

The Project

- 11.7.1 All construction phase elements of the Project have been scoped into the assessment. However, the assessment is primarily focussed on those operations that will involve notable ground disturbance, specifically: new underground cables; substation construction; CSECs; construction compounds; permanent access roads and temporary haul roads (including bellmouths and visibility splays); dismantling of existing pylons; and the installation of foundations for new (temporary and permanent) and replacement pylons.
- 11.7.2 The operational phase involves the presence, operation and maintenance of the proposed infrastructure. Only maintenance operations, where they occur on agricultural land, are considered to have potential effects on agriculture and soils beyond those which may occur during the construction phase.

Spatial scope

- 11.7.3 The spatial scope of the PEIR assessment of agriculture and soils is the Study Area, as described in **Section 11.4**. The locations of temporary and permanent land take have been taken from the agreed design freeze for the PEIR assessment. As explained in **Section 11.4**, as the Project design will continue to evolve in response to consultation feedback, there is scope for the Study Area and the locations of temporary and permanent development to change between PEIR and final submission of the DCO application.

Temporal scope

- 11.7.4 The temporal scope of the agriculture and soils assessment is consistent with the period over which the Project would be carried out, and therefore covers the period 2024 to 2028 (for construction) and thereafter (for operation). The duration of the operational phase is not relevant to the assessment of effects, so is considered on an indeterminate basis.
- 11.7.5 The Project is expected to have a life span of more than 80 years. If decommissioning is required at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration. Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase and decommissioning effects are not discussed further in this chapter.

Potential receptors

- 11.7.6 The principal agriculture and soils receptors that have been identified as being potentially subject to effects are summarised in **Table 11.13**.

Table 11.13 - Agriculture and soils receptors subject to potential effects

Receptor	Reason for Consideration
Agricultural land and land use in terms of the loss of BMV agricultural land	Agricultural land, and BMV land in particular, is a finite natural resource as recognised in planning policy. There is the potential for the direct or indirect loss of agricultural land, including BMV land, as a consequence of the Project and for the scale of that loss to be significant.
Soil resources in terms of potential damage and loss	Soil resources, as recognised in planning policy, are a finite natural resource. There is the potential for soil resources to be lost or damaged as a consequence of the Project; and for the scale of the impact to be significant.

Likely significant effects

- 11.7.7 The effects on agriculture and soils receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 11.14**.

Table 11.14 - Agriculture and soils receptors scoped in for further assessment

Receptor	Likely Significant Effects
Agricultural land	Loss of agricultural land i.e. change of land-use to non-agricultural through placement of infrastructure, but also through indirect losses such as field severance and separation of livestock from water supplies making areas unsuitable for farming. Mainly occurring during construction, but also during small scale, isolated maintenance activities during the operational phase. It is noted that the dismantling of overhead lines during the construction phase could also result in the reinstatement of some land to agricultural use.
Agricultural land	Loss of BMV agricultural land following reinstatement (i.e. change of land-use to lower quality; arable to pasture). Mainly occurring during construction, but also during small scale, isolated maintenance activities during the operational phase.
Agricultural land	Indirect loss of agricultural land, due to limited access or requirement for change to non-agricultural use for land surrounding permanent infrastructure.
Soil resources	Damage to, or loss of soil resources through incorrect management during construction, reinstatement and small-scale isolated maintenance activities, including: <ul style="list-style-type: none"> • Damage to the structure and compaction; • Loss of nutrients (e.g. nitrogen); • Loss of soil biota (e.g. bacteria, fungi, earthworms) and reduction of its activity; • Mixing of soil horizons (especially topsoil with subsoil) reducing their potential for reuse; and • Unauthorised export.

11.7.8 Impacts on agricultural land holdings (farm viability) were scoped out in the socio-economic section of the Scoping Report (last bullet, p373). Subsequent agreement of this position was received from the Planning Inspectorate, the response stated that given the nature and scale of the Project the topic could be scoped out of the ES; but that this should be kept under review and inclusion reinstated should the potential for significant effects be identified. Should this occur the Impact Assessment Would be presented in **Chapter 16: Socio-economics**.

11.8 Assessment methodology

11.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the PEIR**, and specifically in **Sections 4.7 to 4.10**. However, whilst this has informed the approach that has been used in this agriculture and soils assessment, it is necessary to set out how this methodology has been applied,

and adapted as appropriate, to address the specific needs of this agriculture and soils assessment.

- 11.8.2 As explained in **Chapter 4: Approach to Preparing the PEIR**, the early identification of likely significant adverse environmental effects enables appropriate mitigation (e.g. measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the design of a project, or commitments to be made to environmentally sensitive construction methods and practices. The potential impacts of the Project would therefore be identified and assessed, appropriate mitigation put forward (where required) and the residual (post-mitigation) effects assessed to ensure that the overall effect of the Project on agriculture and soils is reduced as far as is practicable.
- 11.8.3 Further data, which remains to be collected up to submission of the DCO application, in relation to agricultural land and soils, comprises:
- soil survey data for areas of permanent development except new and replacement pylon locations (as described in **Section 11.4**) - to be undertaken when the locations of these elements of the Project are confirmed. General details of the planned surveys are described in **Section 11.4**.

Agricultural land

- 11.8.4 BMV agricultural land (Grade 1, 2, and Subgrade 3a) is considered to be a finite national resource and is given special consideration under the NPPF⁵. However, there are no defined criteria for the assessment of effects on agricultural land (understood as a permanent land use change, either directly through built development or indirectly through a permanent shift to non-agricultural land use), and no threshold given for BMV loss (permanent land use change) which should be regarded as significant within an Environmental Impact Assessment (EIA).
- 11.8.5 Statutory Instrument 2015 No. 595, The Town and Country Planning (Development Management Procedure) (England) Order 2015, Schedule 4, Part (y)¹, requires that the local planning authority consults Natural England if the area of a proposed permanent development exceeds 20ha of BMV agricultural land. Although the guidance does not state that this threshold should be used to determine the significance of loss, for the purpose of EIA, it is a guide to consider significance where 20ha or more of BMV is affected by a development. To determine the level of significance, other factors are considered, including whether the development is temporary or permanent and the extent of BMV in the locality.
- 11.8.6 Therefore, the loss of agricultural land will be assessed by estimating the amount and quality of land that may be affected by the Project, with a threshold of 20ha of permanent BMV loss used to determine whether the loss is significant or not. Magnitude of effect and receptor sensitivity classifications are not assigned. Rather, any permanent BMV loss that exceeds 20ha is assessed as significant, whilst any that is temporary or occupies less than 20ha is assessed as being not significant.
- 11.8.7 The assessment of the loss of agricultural land therefore does not take into account temporary land use change, as this land would be returned to agricultural use once construction is complete. Within the loss of agricultural land assessment, the areas of temporary land use change will be reported for illustrative purposes only.
- 11.8.8 The majority of the agricultural land within the Study Area is productive arable land, of which the majority is calculated as being of BMV quality, and predominantly ALC Grade 2 (see **Table 11.9**), as typical of the wider area. An overview of the land-use within the

Study Area and wider area identifies arable and horticultural land tends to be more prevalent within areas graded as BMV (i.e. Grades 1, 2 and Subgrade 3a), land under mixed rotation tends to be on good to moderate quality (i.e. Subgrades 3a and 3b), and pasture land tends to be located on areas of lower quality (i.e. Subgrade 3b, Grade 4). For the purpose of this assessment, it is assumed that agricultural land use is closely related to agricultural land quality, and current land use is therefore reflected in the ALC assessment.

- 11.8.9 The stated criteria have been adopted in previous assessments that have been agreed and accepted as best practice, for instance Viking Link (assessed through the Town and Country Planning Act, with methodology agreed by Natural England) and the North Wales Connection (prepared for assessment through the DCO process, with methodology agreed by the Welsh Government's Land Quality Advisory Service).
- 11.8.10 Where the potential impacts show a requirement for mitigation, appropriate mitigation methods will be suggested. Mitigation is likely to include, but would not be limited to, the use of field-specific data to micro-site temporary and permanent infrastructure toward areas of the lowest agricultural quality, where possible, taking into consideration technical and other environmental considerations.

Soil resources

- 11.8.11 There are no defined criteria or policy guidance on the assessment of the effects of development on soil resources. Therefore, the effect of permanent and temporary development as a consequence of the Project would be assessed in terms of the identified soil resources, their sensitivity, and the degree of loss of soil resource. The assessment criteria are based on professional experience and have been adopted in other assessments which have gained approval through the planning process (either DCO or Town and County Planning Act). These assessments were not restricted to electricity infrastructure projects (although the criteria were used on both the Viking Link and the North Wales Connection projects); and include all development types where impacts to soils had the potential to occur (for instance, mining and minerals sites, residential and commercial developments and renewable energy schemes).
- 11.8.12 The disturbance of soil resources would be assessed by reporting the workability of topsoils and their suitability for reinstatement, and effects assessed on the assumption that good working practice, such as that set out in Defra guidance²⁰, (see **Section 11.6**) is followed.
- 11.8.13 Assessing the sensitivity of soil resources to damage (i.e. resistance and resilience of the soil environment, not the importance of the land for agricultural use) is complicated, as soil resources provide a range of functions, such as supporting plant growth (including food and other crops), water filtration and regulation (role in flood control), nutrient transformation (e.g. role in the nitrogen cycle), carbon storage and sequestration, and supporting biodiversity. The sensitivity criteria for soil resources are based on the erodibility of soils or the presence of ecologically important soils, such as peat. The soil resources assessment considers both temporary and permanent damage. The receptor sensitivity criteria are provided in **Table 11.15**. The magnitude of change from the baseline is defined in terms of the damage to soil resource and loss of soil resources, as provided in **Table 11.16**.
- 11.8.14 Soil erodibility is a measure of the susceptibility of soils to loss both *in-situ* (i.e. as an undisturbed soil profile) and during soil stockpiling, due to wind or water erosion (natural erosion potential). Soil erodibility is considered in the rating of soil sensitivity, with the sensitivity classification of the different soils encountered based upon data compiled by

Cranfield University²⁶. Therefore, as a general rule, heavy (clay rich) soils are classified as low sensitivity (low soil erodibility), whilst light sandy soils are classified as high sensitivity (high soil erodibility).

11.8.15 However, it is important to note that soils of differing texture and structural development may be subject to a range of potential impacts during and following reinstatement. For example, the incorrect handling/reinstatement of a heavy (clay rich) soil whilst in a plastic state may result in a reinstated soil profile with a reduced natural drainage compared to the natural soil profile and a subsequent increased risk of soil loss (erosion) due to surface water run-off. Whereas the permeable nature of light sandy soils means that the natural structural recovery and drainage potential of the soils is more easily maintained upon reinstatement. However, as standard good practice measures for soil handling, such as those described in **Section 11.6** would mitigate against any potential adverse impacts during reinstatement regardless of the soil texture or prevailing structure, only soil erodibility (i.e. the sensitivity of the undisturbed soil profile or soil stockpiles) is considered in the sensitivity criteria of the soil assessment.

Table 11.15 - Receptor Sensitivity (Soils)

Receptor	Sensitivity Justification	
Soil Resources		
Soils with high or very high risk of erosion and organic soils (peat).	High	Development on these soils should be avoided, however if this is not possible, they require special consideration and careful planning of construction methods, e.g. use of temporary working surfaces, careful storage, protection from drying out, in order to preserve their functions. Soils of high biodiversity value. High importance as a carbon store and active role in carbon sequestration, which have little capacity to tolerate change.
Soils with moderate risk of erosion.	Medium	Standard soil management measures would provide appropriate protection to these soils; however, damage is likely to occur if worked in less than ideal conditions, e.g. when wet. These soils should be given appropriate consideration because of their importance for agricultural production.
Soils with small risk of erosion.	Low	These soils are generally more resistant to damage (except peat soils) due to permanent grass cover.
Soils with very small to no risk of erosion.	Very Low	These soils are generally more resistant to damage (except peat soils) due to permanent grass cover.

11.8.16 The magnitude of effect will be assessed in terms of the change from baseline conditions, as defined in **Table 11.16**.

Table 11.16 - Criteria to assess the magnitude of change (Soils)

	Magnitude Damage to Soil Resources	Loss of Soil Resources
High	Permanent change to the quality of the soil resource.	<25% of soil resources suitable for reuse and retained on-site.
Medium	Temporary/reversible change to the soil resource.	25-50% of soil resources suitable for reuse and retained on-site.
Low	Temporary/reversible change to the soil resource.	51-95% of soil resources suitable for reuse and retained on-site.
Very Low	No change to soil resource quality.	>95% of soil resources suitable for reuse and retained on-site.

11.8.17 The classification of effects for loss and damage of soil resources will be assessed using **Table 11.17**. Where effects are determined as Major Adverse or Moderate Adverse, the effect will be considered Significant. Where effects are determined as Minor Adverse or Negligible, the effect will be considered Not Significant.

Table 11.17 - Classification of Effects (Soils)

Sensitivity/value of receptor	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major (Significant)	Major (Significant)	Moderate (Significant)	Minor (Not Significant)
Medium	Major (Significant)	Moderate (Significant)	Minor (Not Significant)	Negligible (Not Significant)
Low	Moderate (Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
Very Low	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

11.8.18 The PEIR assesses the potential impacts based upon the extent of the temporary and permanent landtake for the Project as defined in the current agreed design freeze; although data for the whole of the Study Area are provided within the baseline section (see **Section 11.5**) for completeness.

11.9 Preliminary assessment of agriculture and soils effects

Agricultural land

11.9.1 The data in **Table 11.6** to **Table 11.9** (see **Section 11.5**) considers all land within the Study Area (draft Order Limits). However, the amount of agricultural land either

permanently lost or temporarily removed from agricultural use as a consequence of the Project would be confined to the areas where works would take place. Therefore, the amount of agricultural land directly affected would be less than that represented by the data for the whole Study Area. The assessment has therefore been based on the actual areas of temporary and permanent loss, based on the current design.

11.9.2 Based on the current Project design (**Figure 1.2**), the elements of the Project resulting in permanent landtake are: new build pylons; CSECs; permanent access roads and bellmouths for the substations and CSECs; and substations. It is noted that whilst permanent gantries will be developed, these will be within the fenced areas of the substations and CSECs. It is noted that the current design shows areas of underground cabling as permanent infrastructure; however, in terms of agricultural land the impact is temporary, as following construction the land above the cable would be reinstated to agricultural use. Therefore, for this assessment, underground cabling has been considered as temporary rather than permanent landtake. Elements of the Project resulting in temporary landtake are therefore considered to be underground cable works; temporary pylon structures and dismantled or modified pylons; pylon working areas, temporary scaffolding; temporary access roads and bellmouths; construction compounds; and stringing areas.

11.9.3 The ALC (calculated using a combination of the available Post-1988 survey data^{27,28,29,30} and the Provisional and Predictive ALC datasets^{22, 23}, as described above) for areas of permanent and temporary landtake for the Project are presented in **Table 11.18**.

Table 11.18 - Calculated ALC for areas of permanent and temporary landtake

ALC Grade	Area (ha)	Percentage of land within the Study Area (%)
Permanent landtake		
Grade 2 (BMV)	9.1	0.9
Subgrade 3a (BMV)	0.9	0.1
Subgrade 3b (non-BMV)	1.1	0.1
Grade 4 (non-BMV)	0.3	0.0
Non-agricultural/Urban/ Industrial	4.5	0.5
Total	15.8	1.6
Total BMV	10.0	1.0
Temporary landtake		
Grade 1 (BMV)	2.5	0.3
Grade 2 (BMV)	433.7	43.8
Subgrade 3a (BMV)	261.5	26.4
Subgrade 3b (non-BMV)	220.2	22.3

ALC Grade	Area (ha)	Percentage of land within the Study Area (%)
Grade 4 (non-BMV)	26.5	2.7
Non-agricultural/Urban/ Industrial	12.0	1.2
Total	956.4	96.7
Total BMV	697.7	70.5

- 11.9.4 Based on the current Project design, the total permanent landtake for the Project would be 15.8ha (1.6% of all land within the Study Area), which is predominantly the result of construction of the proposed substations. Over a quarter of the permanent development, 28.5% (4.5ha) has been sited so as to have no impact on agricultural land (mainly associated with Osbaldwick Substation, where all groundworks / new equipment will be sited on existing hardstanding within the current substation site). Given the prevalence of BMV land within the Study Area, it is unsurprising that the majority of the agricultural land which would be lost to permanent development is of BMV quality, however all Grade 1 land has been avoided with developed land comprising Grade 2 (9.1ha) and Subgrade 3a (0.9ha). The total permanent BMV landtake is therefore 10.0ha. The remaining land is Subgrade 3b (1.1ha) and Grade 4 (0.3ha).
- 11.9.5 Based on the current Project design, the temporary land take covers 956.4ha of which 98.7% (944.4ha) is located on agricultural land; which will be restored to, or maintained at, its pre-development quality and returned to agricultural use at the end of the construction period. Given the prevalence of BMV land within the Study Area nearly three quarters of the temporary landtake (697.7ha) occurs on BMV quality land of Grades 1 (2.5ha); Grade 2 (433.7ha) and Subgrade 3a (261.5ha). The non-BMV landtake comprises Subgrade 3b (220.2ha) and Grade 4 (26.5ha) land; with a further 12ha of non-agricultural land also subject to temporary development.
- 11.9.6 The criteria presented in **Section 11.8** require a permanent loss of >20ha of BMV agricultural land for significant effects to agricultural land to occur. **Table 11.18** shows the calculated ALC grading for the areas of permanent landtake. Of the 15.8ha of permanent landtake, 10.0ha would result in the loss of BMV quality agricultural land.
- 11.9.7 The embedded good practice measures (**Section 11.6**) would ensure that any agricultural land subject to temporary development is restored to its original condition (ALC grade) and that no permanent loss of BMV land occurs in these areas.
- 11.9.8 Therefore, based on the agreed design freeze for the PEIR assessment, the total permanent loss of BMV agricultural land is 10.0ha and consequently the effect is **Not Significant**.
- 11.9.9 It is also noted that there is scope for the reinstatement of some BMV land to agricultural use following the replacement of existing pylons along the 275kV Poppleton to MonkFryston (XC/XCP) overhead line, however the gains, if any, are expected to be small and would not influence the outcome of the assessment.

Loss of soil resources

- 11.9.10 Impacts to soil resources (loss and damage) only occur when soils are disturbed (which may include effects such as compaction due to works on the soil surface, as well as those caused by the handling of soils). The assessment has therefore been based on

the actual areas of soil disturbance (permanent and temporary works), based on the agreed design freeze for the PEIR assessment. The elements of the Project constituting areas of permanent and temporary landtake are as described in paragraph 11.9.2; and the data are shown in **Table 11.19**.

Table 11.19 - Soil Associations Present in areas of permanent and temporary landtake

Soil Association	Area (ha)	Percentage of Study Area (%)	Erodibility²⁶
Permanent landtake			
Newport (551d)	0.08	0.01	Very High Risk (Water and also wind)
Blackwood (821b)	0.15	0.02	Small Risk (Wind)
Aberford (511a)	9.15	0.9	Small Risk (Water)
Enborne (811a)	0.13	0.01	Very Small Risk (Water)
Foggathorpe 2 (712i)	1.94	0.2	Very Small Risk (Water)
Urban	4.38	0.4	-
Total	15.85		
Temporary landtake			
Newport (551d)	1.3	0.1	Very High Risk (Water and also wind)
Everingham (821a)	12.5	1.3	High Risk (Wind)
Escrick 2 (571q)	30.1	3.0	Moderate Risk (Water)
Bishampton (572s)	71.4	7.2	Moderate Risk (Water)
Wick 1 (541r)	1.4	0.1	Moderate Risk (Water, but also wind)
Wharfe (561a)	3.7	0.4	Moderate Risk (Water)
Blackwood (821b)	6.6	0.7	Small Risk (Wind)

Soil Association	Area (ha)	Percentage of Study Area (%)	Erodibility ²⁶
Aberford (511a)	331.4	33.5	Small Risk (Water)
Dunkeswick (711p)	52.9	5.3	Very Small Risk (Water)
Foggathorpe 2 (712i)	444.4	44.9	Very Small Risk (Water)
Urban	0.5	0.1	-
Total	956.4		

- 11.9.11 Based on the current Project design, the total permanent landtake for the Project would be 15.8ha (1.6% of all land within the Study Area), predominantly associated with construction of the proposed substations. There are five mapped soil associations²¹ in areas of permanent landtake. The majority of soils in the permanent landtake area (72.0%, 11.4ha) comprise soils which are at very small to small risk of erosion²⁶ (Blackwood, Aberford, Endborne and Foggathorpe 2). Soils of the Newport association are mapped as covering 0.08ha of the permanent landtake area at Osbaldwick Substation; these light sandy soils are at very high risk of erosion by water as well as wind.
- 11.9.12 The presence of these soils within the Study Area at Osbaldwick was verified by the soil survey accompanying the Post-1988 ALC study³⁰, however the Post-1988 data did not map the extent of the association's coverage. However, as previously described the permanent works are associated with the upgrading of the existing pylon, rather than new pylon installation; and the access to the pylon will not require the development of a stoned track (it is likely that trackway panels will be used to protect the soils/ land surface), therefore there will be no disturbance to the highly sensitive Newport soils. The presence of these soils is therefore assumed as a worst case and appropriate soil management measures will be in place. The remaining land is non-agricultural in nature.
- 11.9.13 Based on the current Project design, the total temporary landtake for the Project would be 956.4ha; with any soil resources being reinstated to, or maintained at, their pre-development quality. A total of ten soil associations are mapped within the area of temporary landtake²¹. The majority of soil resources within the temporary landtake area (87.4%, 835.4ha out of 956.4ha) are at small or very small risk of erosion²⁶ (Blackwood, Aberford, Dunkeswick and Foggathorpe 2); whilst soils at moderate risk of erosion²⁶ (Eskrick 2, Bishophampton, Wick 1 and Wharfe) cover a further 106.6ha. Soils of the Everingham association are at high risk of erosion²⁶ and cover 12.5ha of the land subject to temporary landtake and are located in a discrete area associated with the floodplain of the River Ouse (see **Figure 11.2**). As discussed above, soils of the Newport association are at very high risk of erosion²⁶ and are located at Osbaldwick Substation. They are mapped as covering 1.3ha.
- 11.9.14 It is assumed that soils excavated for the temporary works, would be stored on-site and reinstated *in situ* within the same landholding (with negligible unavoidable loss due to mixture of track-base aggregate or removal on wheels). Within the proposed cable

working widths, this is possible because the soil displaced by the cable would be added to the, much larger, amount of soil temporarily excavated for the working area and reinstated along the proposed cable route. Where excavations are to a depth where the quality/nature of the excavated material is not suitable for reuse as a subsoil material within the restoration soil profile as described above (i.e. excavations have gone deeper than the subsoil into the parent material), the material is not considered to be a soil. This non-soil substrate would also be reinstated *in situ* where possible, any excess non-soil substrate would be removed from site and to a suitably licenced and managed facility; following grant of necessary permissions where required.

- 11.9.15 Where *in situ* reinstatement is not possible (permanent development areas), the soil resource would be reused elsewhere within the same landholding, where practicable to do so, for example in landscaping and/or screening. However, it is anticipated that small volumes of topsoil generated at permanent development areas may need to be exported from site for reuse elsewhere (this may be within Order Limits or further afield and would be subject to relevant permissions).
- 11.9.16 The embedded soil management measures based on good practice guidance¹⁸ (**Section 11.6**) would ensure that appropriate handling, storage, reinstatement and transportation methodologies are employed resulting in the properties, function and structure of the soils remaining at a status suitable for reuse; either within the Project or at other consented development sites in the wider area if there is a requirement for soil to be exported from site.
- 11.9.17 The above measures would minimise the loss of soil resources such that over 95% of soil resources (as per criteria in **Table 11.16**) are retained in a state suitable for reuse; resulting in a **very low** magnitude of change (the <5% loss is due to unavoidable small-scale losses arising from factors such as trackout of soils on construction vehicle wheels).
- 11.9.18 Therefore, using the criteria set out in **Table 11.17**, the effect of soil resource loss for the **very low, low** and **medium** sensitivity soil resources would be a **very low** and **Not Significant**; the effect of soil resource loss for the **high** sensitivity soil resources would be a minor and **Not Significant**.
- 11.9.19 The majority of land within the temporary and permanent landtake areas (955ha) comprises the very low, low and medium sensitivity soils. The high and very high sensitivity soils account for 13.9ha, the majority of these being in the areas of temporary development.
- 11.9.20 During the operational phase, localised short-term soil disturbance may occur due to routine maintenance such as annual infrastructure inspections. Less frequent, non-routine, maintenance of the infrastructure may also result in soil disturbance; such work is typically limited to the planned refurbishment of particular components or the replacement of components as required.
- 11.9.21 With appropriate embedded soil management measures in place, the effects to the **low, medium** and **high** sensitivity soils are therefore considered to be the same as the temporary (construction) effects (**very low** and **minor** effects, and **Not Significant**), although the scale and extent of works would be substantially less.

Damage to soil resources

- 11.9.22 Construction activities may result in temporary disturbance to soil resources such as:

- damage to soil structure and compaction, and creation of conditions conducive to excessive drying or wetness;
- mixing of distinct soil horizons (e.g. topsoil with subsoil) reducing their potential reuse;
- changes in the soil profile stone content;
- loss of nutrients (e.g. nitrogen), biota (e.g. bacteria, fungi, earthworms) and reduction in soil fertility; and
- loss of ecosystem services, such as the ability of the soil to support food production and habitat creation.

11.9.23 The length of the construction period/duration of soil disturbance is currently predicted to be up to four years (2024 to 2028), which could result in irreversible or long-term damage to soil quality through handling, and stockpiling. However, the embedded good practice soil management measures (see **Section 11.6**) would ensure that appropriate handling, storage, reinstatement and transportation methodologies are employed resulting in the properties, function and structure of the soils being retained such that the level of damage is reduced to a level commensurate with those experienced during normal farming operations. Consequently, based upon the criteria in **Table 11.16** the magnitude of change would be reduced to **very low** (no change to soil resource quality).

11.9.24 Therefore, using the criteria set out in **Table 11.17**, the effect of soil resource loss for the **very low, low and medium** sensitivity soil resources would be negligible and **Not Significant**; the effect of soil resource loss for the **high** sensitivity soil resources would be a minor and **Not Significant**.

11.9.25 The majority of land within the temporary and permanent landtake areas (955ha) comprises the very low, low and medium sensitivity soils. The high and very high sensitivity soils account for 13.9ha, the majority of these being in the areas of temporary development.

11.9.26 During the operational phase, localised short-term soil disturbance may occur to allow for routine maintenance such as annual infrastructure inspections. Less frequent, non-routine, maintenance of the infrastructure may also result in soil disturbance; such work is typically limited to the planned refurbishment of particular components, or the replacement of components as required.

11.9.27 With appropriate embedded soil management measures in place, the effects on the **low, medium and high** sensitivity soils are therefore considered to be the same as the temporary (construction) effects (**very low** and **minor** effects, and **Not Significant**), although the scale and extent of works would be significantly less.

11.10 Preliminary assessment of cumulative (inter-project) effects

11.10.1 In accordance with Planning Inspectorate Advice Note 17³³ a long list of 'other development', including allocations, has been reviewed and screened to establish those other developments which could result in significant effects in cumulation with the Project. The process followed is described in **Section 4.9** and a long list of developments considered is provided in **Appendix 4C** of the PEIR. **Table 4.5** lists all

³³ Planning Inspectorate (2019) Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects [online]. Available at: <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/> (Accessed 13 October 2021).

the short listed developments identified to date, which will be kept under review as the Project progresses. A detailed assessment of the likely significant cumulative effects will be provided in the ES. At this stage of the Project the other developments which have the potential for significant effects in cumulation with the Project in relation to Agriculture and Soils comprise the following:

- An agricultural unit in Shipton by Beningborough (20/01004/FUL).
- Various developments close to the existing Monk Fryston Substation (proposed motorway services on the A1(M) near Lumby (2019/0547/EIA), potential minerals development (NY/2020/0204/SCO), a gas peaking plant (2020/0594/FULM) and energy storage projects (2021/0633/FULM, 2021/0789/FULM).
- An energy storage project adjacent to Osbaldwick Substation (19/01840/FULM).
- Extensions or additional works at existing quarries at Jackdaw Quarry, Stutton (NY/2021/0098/A27), Newthorpe Quarry (NY/2017/0268/ENV) and Stutton (NY/2018/0009/FUL).
- Proposed housing allocations at Tadcaster (TAD2 105 dwellings) and east of Skelton (ST14: Land West of Wiggington Road 1348 dwellings, 55Ha).

11.11 Preliminary significance conclusions

11.11.1 A summary of the results of the preliminary agriculture and soils assessment is provided in **Table 11.20**.

Table 11.20 - Preliminary summary of significance of effects

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of Change ²	Significance ³	Summary Rationale
Agricultural Land ⁴ : Permanent loss of BMV agricultural land	N/A	N/A	Not Significant	The permanent loss of BMV agricultural land (as identified from the agreed design freeze for the PEIR assessment) is 10.0ha and therefore below the threshold where a significant effect is predicted to occur.
Soil resources: Loss of soil resources	Ranges from very low to high depending upon the sensitivity of the identified soil associations to erosion.	Very low	Not Significant	The embedded soil management measures, based on good practice guidance ¹⁸ would minimise the loss of soil resources so that over 95% of soil resources are retained in a state suitable for reuse (the <5% loss is due to unavoidable small-scale losses arising from factors

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor ¹	Magnitude of Change ²	Significance ³	Summary Rationale
				such as trackout of soils on construction vehicle wheels).
Soil resources: Damage to soil resources	Ranges from very low to high depending upon the sensitivity of the identified soil associations to erosion.	Very low	Not Significant	The embedded soil management measures, based on good practice guidance ¹⁸ would reduce the risk of damage to soil structure and soil deformation (compaction and smearing) to a level where no damage or very small-scale surface damage (equivalent to that done by a typical farm machinery traffic) would be likely to occur.

1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 11.8** and is defined as very low, low, medium and high.
2. The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 11.8** and is defined as very low, low, medium and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 11.8**.
4. No receptor sensitivity or magnitude of change is presented in the assessment of loss of agricultural land, the assessment being based on a threshold of a permanent loss of BMV land greater than 20ha.

11.12 Additional measures

- 11.12.1 The assessment set out above has concluded that it will not be necessary to implement additional measures, as the preliminary impacts to soils and agricultural land are assessed as not significant. However, the approach to describing embedded mitigation (see **Section 11.6**) and additional measures used in this PEIR report is taken from the IEMA Guide to Delivering Quality Development³⁴ (see **Section 4.6**). Additional measures are therefore described as actions that will require further activity in order to achieve the anticipated outcome. There are consequently standard measures and approaches to mitigation (betterment of environmental outcomes) which will be and are being applied on the Project which fall into the additional measures classification.
- 11.12.2 **Table 11.21** therefore sets out additional mitigation measures which will be carried out with respect to soils and agricultural land and outlines how these additional measures will influence the agriculture and soils assessment.

³⁴ Institute of Environmental Management and Assessment (2016). Environmental Impact Assessment Guide to Delivering Quality Development. Available at: <https://www.iema.net/document-download/7014> [Accessed 18-08-2021].

Table 11.21 - Summary of the additional environmental measures

Receptor	Potential Changes and Effects	Additional Measures	Compliance Mechanism
Construction			
Agricultural Land	Permanent loss of agricultural land including BMV. May be direct loss as a consequence of built infrastructure, or indirect through permanent change to non-agricultural use to facilitate these developments.	<p>Micrositing of new pylons and other permanent development to divert built development away from higher quality land, where practicable and taking into account technical and other environmental considerations.</p> <p>Micrositing of new pylons to minimise development in arable land (including mixed use and silage fields) in preference of permanent pasture (as grazing is unaffected by pylon placement), where practicable and taking into account technical and other environmental considerations.</p>	Outline CEMP, secured via DCO requirement, and works plans.
Agricultural Land	Temporary loss of agricultural land including BMV.	Further design refinement within (draft or final) Order Limits to minimise temporary development in arable land (including mixed use and silage fields) in preference of permanent pasture (as grazing is unaffected by pylon placement) and ensure informed and sensitive positioning of temporary new pylons and access tracks within fields, where	Outline CEMP, secured via DCO requirement, and works plans.

Receptor	Potential Changes and Effects	Additional Measures	Compliance Mechanism
		practicable and taking into account technical and other environmental considerations.	
Agricultural Land	Temporary loss of agricultural land through indirect causes such as field severance and separation of livestock from water supplies	Continuation of considerate design facilitated by landowner communications through the Project's Land Team.	Outline CEMP (secured via DCO requirement) would include a requirement for contractors to engage with landowners to ensure that such effects within the Order Limits are minimised.

11.12.3 It is noted that the prevalence of BMV agricultural land within the Study Area, as presented in the baseline data (see **Figure 11.1**, **Figure 11.2** and **Table 11.9**), makes the complete avoidance of BMV land, through route selection and localised micrositing and considerate design, unlikely to occur in many parts of the draft Order Limits. However, it must be noted that the Provisional ALC data on which a large proportion of the baseline data are based does not map variations in ALC grading of less than c. 80ha (approximately 200 acres). Consequently, within the draft Order Limits, small-scale localised variations in ALC grading are very likely to occur; and unidentified/unmapped small areas of non-agricultural land have the potential to be present. Therefore, for example, although a pylon or haul road may be located on land mapped as Grade 2, there is potential for it to be located in lower quality land (albeit potentially still land of BMV quality). The on-going communications with landowners and farmers through the Project's Land Team will allow the identification of lower productivity land (indicative of lower ALC grading) or land which is not used for agriculture; and hence for micrositing/preferential development of these areas to be considered, where practicable. Although the scale of the mitigation achieved cannot be quantified, as the impact assessment presented in the ES will be based on the desk-based data, some betterment in environmental circumstance can be achieved utilising this site-specific method of shifting some development (either temporary or permanent) away from higher quality land where conditions allow. Such micrositing/considerate placement can continue post-consent as long as it occurs within the Limits of Deviation.

11.12.4 Direct permanent loss of agricultural land per pylon is restricted to the area of the four foundation plinths (approximately 4m² per pylon). Where pylons are located within pasture land, the area beneath the pylon can still be grazed and therefore there is no additional (indirect) permanent loss of agricultural land above the direct loss to the foundation plinths. It is acknowledged that where pylons are located within arable rotations or land used for hay and silage cropping, the area beneath the pylon is excluded from agricultural use during the operational phase (indirect loss of agricultural land), as agricultural machinery cannot be used in these areas. Also, the positioning of obstacles within arable fields can be an impediment to the use of large-scale and

automated machinery, increasing the area of exclusion. However, the on-going communications with landowners and farmers through the Project's Land Team will also allow the potential for siting pylons out of arable and silage rotations to be identified. Again, this will result in an agricultural benefit through lessening the impacts to agricultural activities, but this would not be captured in the assessment.

11.13 Residual effects assessment

- 11.13.1 The residual effects are considered to be those effects which occur after additional environmental mitigation measures are applied. However, as described above, although the measures in **Table 11.21** will be/are being applied as standard, their effects cannot be quantified.
- 11.13.2 When considering the Project as a whole, the effects of these additional mitigation measures in terms of reducing the loss of BMV land are likely to be small scale. However, at the farm-level they are likely to have a greater beneficial impact through lessening the disruption to normal farming practices.

11.14 Further work to be undertaken

- 11.14.1 The information provided in this PEIR is preliminary, the final assessment of likely significant effects would be reported in the ES. This section describes the further work to be undertaken to support the agriculture and soils assessment presented in the ES.

Baseline

- 11.14.2 Should access be available, the desk-based assessment of ALC and soils data would be supplemented by a targeted scheme of field survey (to current ALC guidelines¹⁹) at substations and CSEC sites (areas of permanent development). The proposed extent of the surveys incorporates all land which could potentially be directly (through placement of built infrastructure) or indirectly (through change of land use for example through the formation of landscaping or creation of a buffer or exclusion zone around the infrastructure) permanently removed from agricultural use. Surveys would therefore cover the whole field(s) in which the footprint of the permanent infrastructure (substations and CSECs) are sited, and consequently would on occasion extend beyond the currently described draft Order Limits. This whole field approach is considered good practice and could potentially lead to the informed alteration of the Order Limits prior to DCO submission, for example to incorporate areas of lower quality land (which lay outside the draft Order Limits) instead of areas of higher quality land (which were inside the draft Order Limits). Therefore, the baseline will be further defined as the Project progresses and is expected to evolve as data become more specific. Detailed survey of permanent infrastructure locations will allow opportunities for relocation of built development away from higher quality land to be identified, if present. This would help divert built development away from higher quality land or high sensitivity soils, where practicable and taking into account technical and other environmental considerations. Should access to these sites not be possible prior to submission of the DCO application (access refused), the areas of permanent development will be assessed using the desk-based methodology applied to the temporary development areas (see **Section 11.4**), as per the assessment presented in this chapter.
- 11.14.3 Soils would be sampled using manual tools (soil auger and spade) at an approximate density of one inspection per ha, including one soil pit per 10ha. Any permanent access

roads where the alignment is known, would be inspected at approximate 100m (linear) intervals. These data would be used to confirm the agricultural land quality (ALC grading) at the site (using the ALC guidelines¹⁹).

- 11.14.4 Although the DCO design will provide a robust basis for the final assessment of the impacts of the Project on soils and agricultural land, it is acknowledged that the precise positioning of works (for instance new pylon locations) will be subject to Limits of Deviation (LoD) and precise placement within these LoD will not be confirmed until the detailed design is produced by the contractor post-consent (should consent be granted). Therefore, it is proposed that, as agreed with Natural England for other linear electricity infrastructure projects, soil surveys for construction soil management planning would be completed post consent when the precise routeing and placement of infrastructure are known, ensuring the surveys are targeted to areas directly impacted by the Project. The surveys would be undertaken following standard sampling procedures as set out in the ALC guidelines¹⁹, as described above. Site specific data from these pre-construction surveys would be used to inform soil management planning for the Project.
- 11.14.5 For both temporary and permanent works as part of this Project, the data on the erodibility of soil associations²⁶ will be used to identify potential areas of increased soil sensitivity. This assessment would be used to inform the iterative design process, so that areas of high sensitivity can be avoided where practicable and in line with other environmental considerations.
- 11.14.6 Further baseline data will be gained through consultation with the Project's Lands Team, as discussed in **Section 11.12**. This information is likely to include site specific data gained from the Project Lands Team's discussions with farmers and landowners which would assist in defining the routeing and micro-siting of infrastructure; and in describing site specific additional mitigation, if required, to ensure that the impact of construction and operation of the Project on soils and agriculture and agricultural operations are minimised. For example, information on localised areas of peaty or other high sensitivity soils which are too small to be mapped, but which should be avoided if practicable; preferred locations for designated crossing points to minimise disruption to the movement of livestock and machinery; or details of how works could be programmed to avoid specific locations during sensitive times in the farming calendar (for instance lambing sheds during lambing season).
- 11.14.7 Therefore, consultation through the Project's Lands Team would seek to place pylons (and other development/infrastructure) at the least impactful locations, where practicable and taking into account technical and other environmental considerations. As such, where possible pylons/access tracks would be located to the edge of fields, in field margins, or less productive areas of individual fields, ensuring that the maximum area of productive land remains in agricultural use.

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