NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Chapter 22 Land Use and Agriculture

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Contents

Tables

Figures (Volume 3.2)

Glossary of Acronyms

ALC	Agricultural Land Classification
BMV	Best and Most Versatile
CBS	Cement bound sand
CEA	Cumulative Effect Assessment
CO_2eq	Carbon dioxide equivalent
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way
CS	Countryside Stewardship
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ELMS	Environment Land Management schemes
ELS	Entry Level Stewardship
EMF	Electric and Magnetic Fields
EN-1	Overarching NPS for Energy
EN-3	Overarching NPS for Renewable Energy Infrastructure
EN-5	Overarching NPS for Electricity Networks Infrastructure
ES	Environmental Statement
ESS	Environmental Stewardship Scheme
ETG	Expert Topic Group
FRA	Flood Risk Assessment
HDD	Horizontal Directional Drilling
HLS	Higher Level Stewardship
HVAC	High Voltage Alternative Current
IPCC	Intergovernmental Panel on Climate Change
LoWS	Local Wildlife Site
MAFF	Ministry of Agriculture, Fisheries and Food
NFOW	North Falls Offshore Wind Farm Limited
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OCoCP	Outline Code of Construction Practice
OELS	Organic Entry Level Stewardship
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way

RWE	RWE Renewables UK Swindon Limited
SMP	Soil Management Plan
SSER	SSE Renewables Offshore Windfarm Holdings Limited
SSSI	Site of Special Scientific Interest
TCC	Temporary Construction Compound
TJB	Transition Joint Bay

Glossary of Terminology

400kV onshore cable route	Onshore route within which the onshore substation to national grid connection point onshore export cables and associated infrastructure would be located.
400kV onshore cables	The cable circuits which take the electricity from the onshore substation on to the national grid connection point. These comprise High Voltage Alternative Current (HVAC) cables, buried underground.
Bentley Road improvement works	Works involving the widening and improvement of the carriageway along Bentley Road, required to facilitate heavy goods vehicle and abnormal indivisible load access to the onshore cable route and the onshore substation.
Cable circuit	The onshore export cables are comprised of cable 'circuits'. Each cable circuit is typically comprised of three power cables, as well as fibre cables and earth cables. It is expected that each circuit would compromise up to seven cables in total.
Cable ducts	Housing for the onshore export cables, typically comprising plastic high-density polyethylene (HDPE) pipes buried underground. Each cable circuit will potentially comprise up to seven individual ducts (i.e. one per cable).
Haul road	The track along the onshore cable route used by construction traffic to access different sections of the onshore cable route.
Horizontal directional drill (HDD)	Trenchless technique to bring the offshore export cables ashore at landfall. The technique will also be the primary trenchless technique used for installation of the onshore export cables at sensitive areas of the onshore cable route.
Jointing bay	Underground structures, constructed at regular intervals along the onshore cable route to connect the sections of cable together so that each cable is a continuous length, as well as facilitating the installation of the cables into the buried cable ducts.
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Landfall compound	Compound at landfall within which horizontal directional drill (HDD) or other trenchless technique would take place.
Link boxes	Underground chambers or above ground cabinets next to the onshore export cables housing low voltage electrical earthing links.
National grid connection point	The grid connection location for the Project. National grid are proposing to construct new electrical infrastructure (a new substation) to allow the Project to connect to the grid, and this new infrastructure will be located at the national grid connection point.
National grid substation connection works	Infrastructure required to connect the Project to the national grid connection point.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Onshore export cables	The cables which take the electricity from landfall to the onshore substation. These comprise High Voltage Alternative Current (HVAC) cables, buried underground.
Onshore project area	The boundary within which all onshore infrastructure required for the Project will be located (i.e. landfall; onshore cable route, accesses, construction compounds; onshore substation and cables to the National Grid substation)
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the national grid.
Onshore substation construction compound	Area set aside to facilitate construction of the onshore substation. Will be located adjacent to the onshore substation.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.

Temporary construction compound	Area set aside to facilitate construction of the onshore cable route. Will be located adjacent to the onshore cable route, with access to the highway where required.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Transition joint bay	Underground structures that house the joints between the offshore export cables and the onshore export cables.
Trenchless crossing	Use of a technique to install limited lengths of cable below ground without the need to excavate a trench from the surface, used in sensitive areas of the onshore cable route to prevent surface disturbance. Includes techniques such as HDD.
Trenchless crossing compound	Areas within the onshore cable route which will house trenchless crossing (e.g. HDD) entry or exit points.

22 Land Use and Agriculture

22.1 Introduction

1. This chapter of the Environmental Statement (ES) considers the likely significant effects of the North Falls Offshore Windfarm (hereafter 'North Falls' or 'the Project') on land use and agriculture. The chapter provides a characterisation of the existing environment for the onshore project area, followed by an assessment of likely significant effects for the construction, operation and decommissioning phases of the Project.
2. This chapter has been written by Royal HaskoningDHV, with the assessment undertaken with specific reference to the relevant legislation and guidance, of which the principal policy documents with respect to Nationally Significant Infrastructure Projects (NSIPs) are the National Policy Statements (NPS). Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Effects Assessment (CEA) are presented in Section22.4.
3. The ES has been prepared to accompany the Development Consent Order (DCO) application.
4. The assessment should be read in conjunction with following linked chapters (Volume 3.1):
    - ES Chapter 19 Ground Conditions and Contamination (Document Reference: 3.1.21);
    - ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25);
    - ES Chapter 24 Onshore Ornithology (Document Reference: 3.1.26);
    - ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference: 3.1.27);
    - ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28);
    - ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29);
    - ES Chapter 28 Human Health (Document Reference: 3.1.30);
    - ES Chapter 30 Landscape and Visual Impact Assessment (Document Reference: 3.1.32);
    - ES Chapter 31 Socio-Economics (Document Reference: 3.1.33); and
    - ES Chapter 32 Tourism and Recreation (Document Reference: 3.1.34).

22.2 Consultation

5. Consultation with regards to land use and agriculture has been undertaken in line with the general process described in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8). The key elements to date have included scoping and the ongoing technical consultation via the seascape, landscape and visual impact, land use, health and socio-economics and tourism Expert Topic Group (ETG). The feedback received has been considered in preparing the ES. Table

22.1 provides a summary of how the consultation responses received have influenced the approach that has been taken.

6. This chapter has been updated following the consultation on the Preliminary Environmental Informational Report (PEIR) in order to produce the final assessment. Full details of the consultation process will also be presented in the Consultation Report (Document Reference: 4.1) as part of the DCO application.

Table 22.1 Consultation responses

Consultee	Date / Document	Comment	Response / where addressed in the ES
Planning Inspectorate	26/08/2021 Scoping Opinion	Table 3.3 – Potential impacts – mineral resources Loss, damage or sterilisation of mineral resources is scoped into the ES as part of the assessment of ground conditions and contamination. The Inspectorate considers that the economic impact and associated effects of this matter should also form part of the socio-economic assessment, where significant effects are likely to occur.	Potential impacts and likely effects on mineral resources are considered further in ES Chapter 19 Ground Conditions and Contamination (Document Reference: 3.1.21). Consideration of the effects upon economic resources are detailed within ES Chapter 31 Socio-economics (Document Reference: 3.1.33).
Planning Inspectorate	26/08/2021 Scoping Opinion	Table 3.11 – Agricultural productivity during operation. On the basis that the Scoping Report states that there may be permanent loss of best and most versatile (BMV) land during operation of the Proposed Development, which may result in a loss of agricultural productivity, the Inspectorate considers that there is potential for likely significant effects in respect of this matter and does not agree to scope it out of the ES.	Permanent loss of BMV land will be required for the footprint of the onshore substation works area, O&M accesses and the Bentley Road improvement works during the operational phase of the Project. Potential impacts and likely effects on agricultural productivity during operation are considered in Section 22.6.3.
Planning Inspectorate	26/08/2021 Scoping Opinion	Table 3.11 – Loss of BMV land during construction and decommissioning. The Scoping Report indicates that there is potential for impacts to Best and Most Versatile (BMV) agricultural land, with a large extent of the onshore scoping area falling within Grades 1 and 2, but at this stage limited information is presented about the location of construction activity and any need for excavation, handling and storage of soil from BMV land. The Inspectorate therefore does not have sufficient information to conclude that there would be no likely significant effects to BMV land as a result of temporary disturbance during construction and this matter should be scoped into the ES.	Temporary loss of BMV land will be required for the footprint of the onshore cable route, temporary construction compounds, off route haul road and onshore landfall compound. Potential impacts and likely effects on BMV land during construction and decommissioning are considered in Section 22.6.1 and 22.6.3.
Planning Inspectorate	26/08/2021 Scoping Opinion	Table 3.11 – Soil heating during construction and decommissioning. On the basis that impacts arising from soil heating would be associated with the operational phase of the Proposed Development, i.e. relating to buried cable systems, the Inspectorate agrees that this matter can be scoped out of the ES.	Confirm soil heating effects during construction and decommissioning have been scoped out of this assessment. The potential impact and likely effects during operation is considered in Section 22.6.3.3. Buried cable systems emit some heat, however, the electrical system is designed to minimise heat loss to a level which will not affect crop growth.

Consultee	Date / Document	Comment	Response / where addressed in the ES
Planning Inspectorate	26/08/2021 Scoping Opinion	Table 3.11 – Public health and safety during construction and decommissioning (impacts from electric and magnetic fields (EMF)). On the basis that impacts arising from EMF would be associated with the operational phase of the Proposed Development, i.e. the onshore substation, cables and associated infrastructure, the Inspectorate agrees that this matter can be scoped out of the ES.	Confirm likely effects of EMFs during construction and decommissioning have been scoped out of this assessment. The potential operational impacts and likely effects of EMFs are discussed further and assessed in ES Chapter 28 Human Health (Document Reference: 3.1.30).
Planning Inspectorate	26/08/2021 Scoping Opinion	Section 3.4.2, Table 3.10 – Approach to data collection. The Inspectorate considers that sufficient information should be made available to establish the extent and type of receptors, together with the study area, that will be assessed in the ES with respect to land use. If no surveys are conducted to establish relevant receptors this should be clearly explained and justified in the ES. The Applicant should make effort to agree these matters with relevant consultation bodies.	The approach to data collection is considered in Section 22.4. In an ETG meeting in July 2021 NFOW[1] consulted with Natural England, Essex County Council, Suffolk County Council and East Suffolk Council on the data sources, key constraints and the EIA methodology for land use and agriculture. No comments on the proposed methodology were raised.
Planning Inspectorate	26/08/2021 Scoping Opinion	Section 3.4.3.4 – Potential cumulative effects. The Scoping Report states that onshore cumulative effects will be considered as set out in Section 1.8. Potential cumulative effects related to land use include other nearby development projects interacting with the same utilities or existing land uses with temporal overlaps with the project's construction phase. The ES should clearly explain how the onshore cumulative effects of the Proposed Development and other relevant developments have been assessed so that any conclusions over the significance of cumulative effects can be demonstrated. Other relevant projects should be identified in consultation with relevant consultation bodies.	The cumulative list of projects was consulted on at PEIR stage. Table 22.19 contains a list of the projects scoped in and out of the cumulative assessment for land use and agriculture. In summary, Five Estuaries Offshore Wind Farm ('Five Estuaries') and Norwich to Tilbury are the two projects scoped in to the cumulative assessment. Cumulative effects for the ES assessment are considered in Section 22.8.

[1] NFOW is a joint venture between SSE Renewables Offshore Windfarm Holdings Limited (SSER) and RWE Renewables UK Swindon Limited (RWE).

Consultee	Date / Document	Comment	Response / where addressed in the ES
Planning Inspectorate	26/08/2021 Scoping Opinion	Approach to the assessment. The ES should describe how likely significant effects have been assessed and determined with respect to the land use aspect, with reference to the over-arching methodology which has been presented in Section 1.8.2 of the Scoping Report or any specific methodology that is used. The ES should be clear on how any conclusions on likely significant effects have been reached for the land use assessment taking into account relevant guidance.	The approach to the assessment is considered in Section 22.4.
Planning Inspectorate	26/08/2021 Scoping Opinion	Mitigation. The ES should how explain how any mitigation that may be considered necessary to address likely significant effects has been identified and how this mitigation would be secured.	Embedded mitigation is considered in Section 22.3.3.
Planning Inspectorate	26/08/2021 Scoping Opinion	Consultation. The ES should explain how consultation with the relevant consultation bodies informed the assessment of land use including the study area, methodology adopted to identify likely significant effects and appropriate mitigation measures as necessary.	Consultation is considered in Section 22.2.
Natural England	16/08/2021 Scoping Opinion	Section 1.6.3 Points 70 + 76 We welcome consideration of Public Rights of Way (ProW). We would expect consideration for techniques for crossing the Coast Path and ProW to be included in the EIA. Further detail on crossing ProWs including details of suitable techniques to be included in the ES.	Impacts on Public Rights of Way (PRoWs) are considered in ES Chapter 32 Tourism and Recreation (Document Reference: 3.1.34).
Little Bromley Parish Council	09/08/2021 Scoping Opinion	Little Bromley Parish Council supports the need for Offshore Windfarms as part of the UK overall power mix. We request that there is minimal impact on the Parish for the Onshore part of this development. We are concerned that a requirement has been made for up to 70 metre working width for laying underground cables as this will be very disruptive. We would also like to point out that many of the farms in the Parish rely on crop irrigation systems for which extensive underground pipework is present. These irrigation systems will need to	Impacts on utilities are assessed in Section 22.6.2.2 and 22.6.4.2. Impacts on agricultural land drainage are also assessed in Section 22.6.1.1.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		be considered alongside any water mains, gas mains and electric mains in the Parish.	
Defence Infrastructure Organisation	16/08/2021 Scoping Opinion	It is appreciated that at this stage aspects of the onshore element of the proposed development have not yet been finalised. The MOD would request to be consulted to allow any impact on MOD assets to be assessed. Maps identifying an indicative cable corridor and landfall are included in the Scoping Report (Drawing nos. PB9244-RHD-ZZ-OF-DR-GS-0008 Rev. 04, PB9244-RHD-ZZ-OF-DR-GS-0011 Rev. 04, and PB9244-RHD-ZZ-LN-DR-GS-0073 Rev.01), MOD request that we are consulted when the cable route and onshore landfall location are finalised.	The MoD will be consulted on the ES, which indicates a refined onshore project area from that presented in the Scoping Report.
Network Rail	09/08/2021 Scoping Opinion	Upon review of the information provided at this stage, Network Rail would like to inform you that any pylons to be installed will require Wayleaves from Network Rail. Interactions between the development and level crossings, where possible, must be avoided. I trust the above clearly sets out Network Rail's position on the planning application. Should you require any more information from Network Rail, please do not hesitate to contact me.	Pylons are not currently being proposed within the Project's design envelope. Furthermore, direct interaction with level crossings is not included within the Project's design envelope.
Natural England	14/07/2023 PEIR	Taking into consideration the outcomes of the Offshore Transmission Network Review (OTNR) Natural England's preference would be for a shared onshore corridor between North Falls and Five Estuaries OWF projects. This would minimise impacts at the landfall and along the onshore cable route and reduce disruption to protected sites and species. The potential for the first project to install the ducts for the second project should be considered within the application and draft Development Consent Order, to minimise impacts and disturbance. We also note within the Dogger Bank South PEIR that there is a proposal for the DBS East and West cables to be bundled together, irrespective of the build out scenario and project developer. This is something we would also anticipate the Application considering as part of embedded project design mitigation options.	The grid connection options considered in the ES are outlined below: Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a Project alone onshore cable route and onshore substation infrastructure. Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries. Option 3: Offshore electrical connection, supplied by a third party.

Consultee	Date / Document	Comment	Response / where addressed in the ES
			Option 2 has been selected for assessment within this chapter (as a worst case scenario). It is worth noting that the location of the onshore cable route for North Falls has been designed in collaboration with Five Estuaries, regardless of whether or not the first project installs the ducts for the second project (as set out in Option 2 above). Realistic worst case scenario parameters (for Option 2) for the construction of the onshore cable route are considered in Table 22.2. Embedded mitigation is set out in Section 22.3.3. The likely significant effects of the first project installing the ducts for the second project are considered in Section 22.6.
Natural England	14/07/2023 PEIR	More detailed information will need to be provided in the ES regarding the anticipated HDD activities, including access routes from the intertidal until the exit pits. Potential impacts arising from HDD activities will also need to be considered and assessed in the ES.	HDD will be used as the preferred construction method at the landfall, reducing the potential for disturbance of surface features of the Holland Haven Marshes Site of Special Scientific Interest (SSSI). Installation by HDD would require a fenced landfall construction compound. A maximum 150 x 75m temporary landfall construction compound for up to two transition joint bays (TJBs) may be required. An Outline Horizontal Directional Drill Method Statement and Draft Contingency Plan is submitted with the DCO application (Document Reference 7.15). More information on HDD is provided in ES Chapter 5 Project Description (Document Reference: 3.1.7).
National Farmers Union (NFU)	14/07/2023 PEIR	The NFU strongly feels that RWE need to consult fully with landowners affected by any onshore apparatus and cable construction works. Section 22.6.1.1.3 within Chapter 22 of the PIER in relation to	The Applicant has undertaken negotiations with a group of land agents (“Land Agency Group”) to agree a precedent set of Heads of Terms in respect of an Option Agreement. The Land Agency Group

Consultee	Date / Document	Comment	Response / where addressed in the ES
		the temporary loss of agricultural land, states that the planning and timing of works will be discussed with landowners and private agreements are to be sought with the relevant landowners and occupiers. It is also stated that private agreements will help manage the short term loss (up to 2 years) of agricultural land and ensure full land recovery within 5 years post-construction. The NFU is pleased to see that the North Falls project intend to engage with landowners and occupiers to minimise the impact on their property and businesses. The NFU would like to see this begin in the early stages to understand the businesses that will be impacted and any mitigation measures or timings of the works being able to be incorporated into the scheme design and programme at the outset. The NFU would also like to see discussions regarding private agreements take place as early as possible to enable these discussions to progress ahead of the submission of the DCO.	currently represents 68% of Category 1 Owners or Reputed Owners with a further 6% represented by other land agents outside of the group. A summary of those negotiations undertaken can be found in the Statement of Reasons (Document Reference: 6.5) with status of negotiations with each relevant land interest set out within the Compulsory Acquisition Schedule (Document Reference: 6.6). The statutory consultation process and evidence of the Project's consultation with stakeholders to date is captured in ES Chapter 7 Technical Consultation (Document Reference: 3.1.9). At PEIR, temporary loss of agricultural land was assessed as minor adverse, which is not significant in EIA terms. At ES, temporary loss of agricultural land is assessed as moderate adverse, which is significant in EIA terms. The change in likely significant effect is due to greater certainty regarding the location of the Project infrastructure. At PEIR, uncertainty existed regarding the location of the onshore project area due to a wider project envelope being considered at the time. Now the location of the onshore cable route, Temporary Construction Compound (TCCs), access points and onshore substation works area have been identified, greater certainty regarding the sensitivity of the receptor can be concluded. >20ha of the onshore project area is now confirmed as BMV, which is categorised as a receptor of 'high' sensitivity, which therefore results in an effect of moderate adverse significance. Full details of the updated assessment are provided in Section 22.6.
NFU	14/07/2023 PEIR	Section 22.8.3 within Chapter 22 of the PIER, states that the Five Estuaries Wind Farm and that the Norwich to Tilbury project (formerly known as Norwich to Tilbury) have potential direct cumulative impacts. It is stated that the applicant is in regular and ongoing dialogue with Five Estuaries Offshore Wind Farm Ltd. The NFU would like to see that the project is exploring options to work collaboratively with other infrastructure projects in the area, such as Five Estuaries and the Norwich to Tilbury project which will reduce the overall cumulative impact. The NFU would like to understand further how the projects are working together to reduce the overall impact of	Although subject to separate DCOs, North Falls and Five Estuaries have undertaken activities to work collaboratively as far as possible. This has included co-design of the projects' onshore cable route and the co-location of both projects' onshore substation infrastructure and including options in both projects' DCOs for a joint build-out of the two projects' cable ducting to minimise certain environmental effects, including a reduction in the working footprint required therefore reducing effects on land and agriculture. Co-ordination on assessment has also taken place to ensure alignment on mitigation can be delivered where practicable.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		the projects in the area. Specifically, the NFU would like to understand how the Five Estuaries Wind Farm and the North Falls Wind Farm projects are working collaboratively to reduce the cumulative impact of the construction of the projects in one area in terms of land requirements and construction timings.	Furthermore, North Falls, Five Estuaries and national grid have also co-ordinated in sharing data and seeking to work together on a number of aspects of the projects' environmental assessment. Full details on co-ordination and collaboration can be found in the Co-ordination Report (Document Reference 2.5), submitted with the DCO application. As a result of ongoing collaboration, a detailed CEA for effects arising from the development of both North Falls and Five Estuaries has been undertaken for land use and agriculture in Section 22.8.3.1.
NFU	14/07/2023 PEIR	Heat dissipation is a concern amongst farmers affected by the scheme, which can impact the land for the lifetime of the project. Heat dissipation has been seen on previous underground cable schemes and can have a significant impact on the crops growing in fields affected, causing crops to grow at different rates which leads to issues in carrying out agricultural operations at the best time to care for such crop effectively. Section 22.6.3.3 of the PEIR (Land Use and Agriculture) states that the design of the onshore cable system would seek to minimise any energy losses. The NFU would like to further understand the measures taken to reduce the impact of heat dissipation on the scheme.	Any effect on soil heating would be highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables would be buried at a depth no shallower than 1.2m below ground level depending on ground conditions. Where necessary, for example if there is rock, concrete or another obstacle close to the surface, the cables may need to be laid at a shallower depth, with warning tape or tiles placed no less than 0.9m below the surface. In addition, the use of Cement Bound Sand (CBS) will remove any material heat transfer from the cables to the surrounding environment. As stated in the PEIR, the design of the onshore cable system would seek to minimise any energy losses through the use of a stabilised backfill such as CBS. A stabilised backfill like CBS is used to encase the cable ducts as it has low thermal resistance to conduct the heat produced during electricity transmission. This is commonly used to ensure that the thermal conductivity of the material around the cables is of a known consistent value for the length of the installation.
NFU	14/07/2023 PEIR	Section 22.5.2.2 of the PIER (Land Use and Agriculture) states that 9.84% of the onshore project area is Grade 1 agricultural land, whilst 20.21% is grade 2 and 54.80% is grade 3 (Table 22.13). Paragraph 76 also highlights that the onshore substation zone is located within	Where works are to take place within BMV / BMV is to be lost as part of the Project, this is only considered in situations where no reasonable alternative could be identified when balancing other

Consultee	Date / Document	Comment	Response / where addressed in the ES
		Grade 1 agricultural land and therefore this area of land will be acquired permanently and removed from agricultural production. The NFU strongly feels that that the project should avoid best and most versatile land wherever possible, in particular where permanent acquisition is required. The NFU also feels strongly that the impact the project will have on agricultural businesses needs to be considered in the development of the project. Section 22.6.1.1.3 within chapter 5 of the PEIR stated that the land temporarily taken out of production for the cable route, could be done so for a period of 18 months, which could be two growing seasons. The NFU is pleased to see that consideration has been given to the impact of the scheme on agricultural land and businesses, including access to severed land, discussing the timings of construction works with farmers to reduce the impact on agricultural productivity and avoiding land within environmental schemes wherever possible (Chapter 22 of the PEIR, Land Use and Agriculture – Table 22.3). Although it is noted that the onshore substation zone and the some of the onshore cable route is proposed on land within environmental schemes. The construction and surface apparatus may cause significant disruption to agricultural land and businesses. The NFU would expect there to be consultation with farmers over practical matters including access, position of surface apparatus and accommodation works required to mitigate the impact on agricultural businesses.	project engineering and design feasibility, planning and environmental constraints. Description of the Project's site selection process is presented in ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6), and assessment of the effects upon BMV is set out in Section 22.6. The site selection process has taken impacts on BMV land into account as a balance against other technical engineering, planning and environmental constraints when selecting a location for the siting of the onshore substation. As such, the loss of agricultural land has been minimised where practicable, whilst also taking into account the technical and safety requirements of the site, the screening and environmental mitigation requirements. Embedded mitigation for the permanent loss of agricultural land is discussed Section 22.3.3.
NFU	14/07/2023 PEIR	The NFU notes and is pleased to see that a draft Code of Construction Practice will be submitted with the DCO application (Chapter 22 of the PIER, Land Use and Agriculture – Table 22.3). The NFU is also pleased to see that RWE will appoint a local specialised land drainage consultant to develop both pre and post-construction drainage plans, as stated within section 22.6.1.1, Chapter 22 of the PIER. It is also noted that the outline Code of Construction Practice (CoCP) will include soil management measures. The NFU has specific wording that it would like to see included in an Outline Code of Construction Practice to cover how practical aspects of the construction should be dealt with in relation to agricultural land and would welcome the opportunity to engage with RWE on this. The NFU wording covers the following: a) Role of an Agricultural Liaison Officer	This has been noted by the Applicant. The Outline Code of Construction Practice (OCoCP) will consider the NFUs comments and proposed wording for inclusion and would be happy to discuss this with NFU following DCO application submission. A Construction Practice Addendum is being negotiated with the Land Agent Group. This is a document which would be an appendix to the agreed option agreements, addressing points a) to g) directly. The Construction Practice Addendum is not a DCO application document but is intended to provide additional detail to that contained within the OCoCP (Document Reference: 7.13) and will serve as a legal commitment by North Falls as to how items a) to g) will be managed within the final Code of Construction Practice, secured through DCO Requirement.

Consultee	Date / Document	Comment	Response / where addressed in the ES
		b) Records of Condition c) Biosecurity d) Irrigation e) Agricultural Land Drainage f) Treatment of Soils g) Agricultural Water Supplies	
Little Bromley Parish Council	07/2023 PEIR	An onshore development would industrialise our precious rural landscape with a large substation and large swathes of farmland permanently affected by underground cabling. Such a development would be a permanent disfigurement of the parish, remove valuable arable land necessary for food security from production, generate significant construction and ongoing noise, and affect residents and community amenities. There is concern that the development will negatively affect sale potential and sale value of properties in the area.	Details of the likely significant effects of the Project have been considered in detail throughout this ES; in particular effects from loss of agricultural land are considered within this chapter (Section 22.6).
Forestry Commission	19/04/2024 Targeted consultation	It should be noted there is also a 1.28ha area of woodland within the area marked for the Project's National Grid Connection Point that was either established or managed with the support of public money from the Farm Woodland Premium Scheme (FWPS). (Approx location: TM 0756 2924) This grant is still in obligation. The landowner is expected to meet all the Terms and Conditions of the agreement contract. Failure to do so would likely require the Forestry Commission to seek to recover all of the relevant grant that has been paid for that area.	NFOW are not proposing works to the existing land within the national grid connection point within this DCO application. We are proposing works within a site already made ready by national grid, for NFOW to install connecting electrical infrastructure (switchgear bays, termination infrastructure, control equipment). It will be within national grid's consent application regarding what the intention is to do with any woodland on site.
Little Bromley Parish Council	21/04/2024 Targeted consultation	An onshore development would industrialise our precious rural landscape with a large substation and large swathes of farmland permanently lost and/or permanently affected by underground cabling. Such a development would … remove valuable arable land necessary for food security from production.	As outlined in the response above, an assessment of the potential permanent effects upon agricultural land from underground cabling, either from soil heating, EMF and from changes to topsoil, are unlikely to occur. Full details on assessment of these factors are provided in Section 22.6. Details of the likely significant effects of the project have been considered in detail throughout this ES; in particular effects from loss of agricultural land are considered within this chapter (Section 22.6).

22.3 Scope

22.3.1 Study area

7. The study area for direct effects on land use and agriculture has been defined on the basis of the onshore project area identified for ES. The study area for land use and agriculture is shown on ES Figure 22.1 (Document Reference: 3.2.18).

22.3.2 Realistic worst case scenario

8. The final design of North Falls will be confirmed through detailed engineering design studies that will be undertaken post-consent. In order to provide a precautionary but robust impact assessment at this stage of the development process, realistic worst case scenarios have been defined in order to assess the likely significant effects that may arise. This approach to EIA, referred to as the Rochdale Envelope, is common practice for developments of this nature, as set out in Planning Inspectorate Advice Note Nine (2018). The Rochdale Envelope for a project outlines the realistic worst case scenario for each individual impact, so that it can be safely assumed that all other scenarios within the design envelope will have less impact. Further details are provided in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

9. A brief description of the realistic worst case scenario is provided below, and the worst case scenario parameters for the assessment of likely significant effects scoped into the EIA for the land use and agriculture assessment are then summarised in Table 22.2. These parameters are based on ES Chapter 5 Project Description (Document Reference: 3.1.7), which provides further details regarding the Project's design, construction and operation.

22.3.2.1 Grid connection options

10. The worst case scenario presented here is based on the grid connection option which represents the worst case for this topic. The grid connection options considered in the ES are outlined below:

    - Option 1: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, with a project alone onshore cable route and onshore substation infrastructure.
    - Option 2: Onshore electrical connection at a national grid connection point within the Tendring peninsula of Essex, sharing an onshore cable route and onshore duct installation (but with separate onshore export cables) and co-locating separate project onshore substation infrastructure with Five Estuaries.
    - Option 3: Offshore electrical connection, supplied by a third party.

11. Grid connection Option 2 is considered the realistic worst case scenario for the land use and agriculture assessment because the build out requires four sets of cable ducts and associated joint bays to be installed, impacting upon the largest footprint of the three grid connection options.

12. Under Option 2, the Project's onshore infrastructure comprises the following elements:

- Landfall, where the offshore export cables are brought ashore;
- Onshore cable route, which includes space for temporary works for the installation of cable ducts and buried onshore export cables, including areas for TCCs, construction and operation and maintenance accesses (including Bentley Road improvement works);
- Onshore substation, proposed to be located west of Little Bromley;
- Onshore substation works area, which includes land required for temporary construction, export cables, means of access, drainage, landscaping and environmental mitigation for the onshore substation;
- The search area for the East Anglia Connection Node (EACN) (the Project's national grid connection point), within which will be located the Project's national grid substation connection works.

13. Collectively, the footprint of the Project's onshore infrastructure is referred to herein as the 'onshore project area' and is shown on ES Figure 5.2 (Document Reference: 3.2.3). The Project's onshore infrastructure outlined above is proposed to be located entirely within the Tendring peninsula of Essex.

Table 22.2 Realistic worst case scenario of effects arising from development of North Falls alone – Option 2 (installation of ducts for a second project)

Element of the onshore infrastructure	Parameter	Notes
Construction		
Landfall	Landfall HDD (temporary works) physical parameters: HDD temporary works area (2 circuits) = 75m x 150m Individual TJB dimensions / permanent land take = 4 x 15m Maximum No. of TJB = 2 Maximum HDD depth = 20m	Duration includes compound establishment, HDD, transition bays, and reinstatement.
	Duration: 13 months (of which HDD = 6 months) HDD to include 24 hour / 7 days working where required	
Onshore cable route	Cable route construction physical parameters: Working width = 72m open trench, 90m at shallow HDD crossings, 130m at deeper HDD crossings Corridor length = 24km Cable trench width (max.) = 3.75m No. of sets of cable ducts = 4 No. of trenches = 4 Maximum cable burial depth = 2m Minimum cable burial depth (to top of protection tile) = 0.9m Minimum target cable burial depth = 1.2m Haul road carriageway width = 6m (up to 10m at passing places) Jointing bays = Up to 192 (approximately every 500m) buried below ground Jointing bay construction footprint (per bay) = 4 x 15m Jointing bay depth = 2.15m Temporary construction compound footprint = 150 x 150m (main compound) 100 x 100m (satellite compounds) No. of compounds (est.) = 11	Overall duration includes establishing / reinstating TCCs and haul roads, cable installation (trench excavation, duct installation, cable jointing), HDD (includes compound establishment, HDD and reinstatement).

Element of the onshore infrastructure	Parameter	Notes
	Trenchless crossings physical parameters: Maximum width of buried cable = 130m Maximum trenchless crossing depth = 20m HDD compound dimensions = 75 x 150m	
	Durations: Bentley Road improvement = 6-9 months Cable route works = 18-27 months per project, with a 57 month gap in between i.e. 111 months start to finish Cable installation = 12 months Major HDD (each location) = 8 months (of which HDD = 4 months) Minor HDD crossings = 2 months Major HDD crossings to include 24 hour / 7 days working where required.	
Onshore substation	Onshore substation physical parameters: Indicative Substation construction footprint = 280 x 210 Construction compound footprint = 250 x 150m	
	Duration of onshore substation construction works: Construction duration = 21-27 months	
400kV connection to the NGET substation	400kV cable installation: No. of cable circuits = 2 No. crossings = 2	
Operation		
Onshore cable route	Cable route operational physical parameters: No. of link boxes = up to 96 Link box footprint (per box) = 0.6 x 1 x 1.5m Cross-sectional area of buried cement-bound sand = 0.6m^2	It is worth noting that approximately 7.64ha of land has been included in the onshore project area for O&M accesses. These O&M accesses comprise private roads, field boundaries and agricultural tracks that North Falls intend to secure the legal rights to route vehicles down during operation of the Project. The Applicant does not intend to alter the land to accommodate these accesses, therefore no additional agricultural land has been taken out of use. As such, O&M accesses are

Element of the onshore infrastructure	Parameter	Notes
		not considered further as part of the permanent land take during operation.
	Bentley Road improvement works: Permanent footprint: 3.07ha	
Onshore substation	Onshore substation physical parameters: Permanent substation footprint (including additional substation earthworks, substation drainage and ancillary works) = 47.31ha	
Decommissioning		
No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route and onshore substation. It is also recognised that legislation and industry good practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled where practicable and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the purposes of a worst case scenario, the impacts will be no greater than those identified for the construction phase.		

22.3.3 Summary of mitigation embedded in the design

14. This section outlines the embedded mitigation relevant to the land use and agriculture assessment, which has been incorporated into the design of North Falls (Table 22.3). Where other mitigation measures are proposed, these are detailed in the impact assessment (Section 22.6), where applicable.

Table 22.3 Embedded mitigation measures

Parameter	Mitigation measures embedded into North Falls design
Site selection	The onshore project area and onshore substation works area (was 'onshore substation zone' at PEIR) have been defined following an extensive site selection process, which has sought to take account of environmental, engineering, planning and land requirements to seek to identify the least sensitive project location. The site selection process is described in detail in ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6). The site selection process has included consideration of the following design principles: • Minimising land take where practicable; • Reducing severed land parcels; • Aligning with field boundaries; • Avoiding BMV land where practicable; • Avoiding land allocated in local plans or within planning applications/extant planning permissions; • Avoiding utilities and their required standoff distances as far as possible. The Project's site selection process includes a balance between different constraints in order to select the preferred option. This included consideration of impacts on BMV. During this process, the technical requirements for the onshore substation included the necessity to site it in proximity to the proposed EACN. All viable sites in close enough proximity to the EACN were situated on BMV, and as such to select a viable site BMV could not be avoided. During the design process the Applicant has sought to minimise the scale of the Project's permanent infrastructure to seek to ensure the permanent loss of BMV has been kept to a minimum. Further details of the site selection process can be found in in ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6).
Agricultural drainage	The Applicant will appoint a land drainage consultant to develop pre-and post-construction land drainage plans. Additionally, existing land drainage systems will be maintained during construction and land drainage would be reinstated where impacts cannot be avoided following completion of construction works and during the reinstatement phase. An OCoCP is being submitted with the DCO application, and this includes outline soil management measures and outline the mitigation measures and industry good practice techniques, which contractors would be obliged to comply with. The DCO will contain a Requirement to submit a final CoCP and Soil Management Plan (SMP) (which must be in accordance with the OCoCP) prior to commencement of construction.
Temporary loss of agricultural land	Wherever practicable, access to severed land for farm vehicles and agricultural machinery will be maintained. Where necessary and feasible, crossing points would be discussed and agreed with landowners and occupiers by the Agricultural Liaison Officer (ALO) pre-construction. Where practicable and in order to reduce impacts on agricultural productivity, the planning and timings of works will be discussed with landowners and occupiers. An OCoCP has been submitted alongside the DCO application, which includes the appointment of an ALO who will undertake discussions with landowners to identify ways in which the impacts of construction works can be mitigated. Following construction, the Project will reinstate the surface of the affected land to a condition similar to that which existed prior to entry being taken and as evidenced by a pre-entry Schedule of Condition. A Schedule of Condition will be undertaken prior to entry to assess the soil composition and depth of topsoil. Prior to construction, a SMP will be prepared along with a soil sampling survey. This information will be used during reinstatement to ensure the soils are returned to their former condition suitable for previous use. Contractors will abide by Department for Environment, Food and Rural Affairs (Defra's) 2009 Construction Code of Practice for the Sustainable Use of Soils on Construction Sites PB13298 or latest relevant

Parameter	Mitigation measures embedded into North Falls design
	available guidance, ensuring the working area will be reinstated to its pre-existing condition as far as reasonably practical. Habitat reinstatement method statements will be implemented for all habitats reinstated following the completion of construction (including semi-improved grassland, hedgerows and arable field margins).
Loss of soil to erosion	An SMP, including a Construction Method Statement for soil handling, will be completed in advance of construction by a suitable and competent soil specialist, who will have experience of working in the Essex region if reasonably possible, and agreed with the relevant planning authority in advance of the works. Measures set out in the Ministry of Agriculture, Fisheries and Food (MAFF) (2000) Good Practice Guide for Handling Soils and Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites will be adopted and included in the SMP, secured within the Code of Construction Practice (CoCP), including: • Consider the weather conditions where it is appropriate to work for each soil type; • Store soil appropriately; • Ensure effective drainage systems are used during construction; • Reinstate drainage systems following construction; • Reinstate and plant vegetation following completion of the construction works; and • Produce a SMP outlining the mitigation measures and best practise techniques, which contractors would be obliged to comply with.
Soil degradation	Mitigation measures to further reduce the effect of the construction activities include developing a SMP as part of the CoCP, secured through DCO requirement, which will set out procedures for the appropriate handling of soils during the construction works, including: • Using a competent contractor for soil handling, storage and reinstatement under Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites; • Storing topsoil adjacent to where it is stripped, where practicable; • Seeding of topsoil bund with clover mix to fix nutrients and keep the soil live, therefore limiting soil loss and requirement for significant inputs when reinstated; • Storage of the excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation; • Handling of soils according to their characteristics; • Limiting mechanised soil handling in areas where soils are highly vulnerable to compaction during wet weather; • Restricting movements of heavy plant and vehicles to specified routes; and • Minimise excavation footprint as much as reasonably possible.
Agri-environment Schemes	The embedded mitigation relating to Agri-environment schemes will be the avoidance of land parcels that are subject to Environmental Stewardship Schemes (ESS) or Countryside Stewardship (CS) Schemes, wherever possible. The Principal Contractor would be required to comply with the SMP, as detailed in the CoCP, which will include measures for the reinstatement of soils post-construction. In general, it is considered that any ecological losses associated with impacts to agri-environment schemes will be mitigated through the embedded mitigation set out in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25). This includes mitigation relating to habitat reinstatement, in particular around hedgerows, arable field margins and semi-improved grassland habitats.

15. Following construction, the affected agricultural land will be reinstated to pre-construction condition and where this is not possible the Project will have a statutory obligation to pay compensation to landowners under the Compensation Code.

16. The majority of the onshore cable route works are buried, therefore impacts on agri-environment schemes are limited to the construction phase of the Project. However, where impacts to land subject to an agri-environment agreement cannot be avoided during construction, these will be dealt with through the Rural

Payments Agency by the agreement holder / landowner who will need to seek a derogation with compensation paid under the Compensation Code to reimburse a landowner's financial losses where appropriate.

22.4 Assessment methodology

22.4.1 Legislation, guidance and policy

22.4.1.1 National Policy Statements

17. The assessment of potential impacts upon land use and agriculture has been made with specific reference to the relevant legislation and guidance, of which the principal policy documents with respect to NSIPs are the NPS. Those relevant to the Project are:

- Overarching NPS for Energy (EN-1) (Department for Energy Security and Net Zero (DESNZ) 2023a);
- NPS for Renewable Energy Infrastructure (EN-3) (DESNZ, 2023b);
- NPS for Electricity Networks Infrastructure (EN-5) (DESNZ, 2023c);

18. The specific assessment requirements for land use and agriculture, as detailed in the NPS, are summarised in Table 22.4 together with an indication of the section of the ES chapter where each is addressed.

Table 22.4 NPS assessment requirements

NPS requirement	NPS reference	ES reference
Overarching NPS for Energy (EN-1)		
The ES (see Section 4.3) should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan.	Paragraph 5.11.8	The onshore project area primarily comprises of agricultural land, some of which is enrolled on Agri-environment schemes. The onshore project area overlaps nationally important designations and landscapes including: • Holland Haven Country Park; • Holland Haven Local Nature; Reserve; and • Holland Haven Marshes Site of SSSI. The onshore project area borders Simon's Wood Local Wildlife Site (LoWS) (Thorpe-Le Soken district) and Great Holland Pits Local Wildlife Trust site. Existing land uses are detailed further in Section 22.5. Likely significant effects on land use during construction and operation assessed within this chapter include: • Impacts on agri-environment schemes; and • Disruption to existing utilities. A detailed assessment of these potential construction and operation effects is provided in Section 22.6.
Applicants will need to consult the local community on their proposals to build on	Paragraph 5.11.9	There is no land take from open access land, sports or recreational buildings

NPS requirement	NPS reference	ES reference
existing open space, sports or recreational buildings and land.		required during the Project's construction, operation or anticipated to be required during decommissioning (see Section 22.5.2.5) and as such effects on these receptors is not considered further within this chapter.
Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5).	Paragraph 5.11.12	The majority of agricultural land within Essex county is BMV land, and as such the majority of the onshore project area comprises Grades 1, 2 and 3a BMV land. To minimise degradation of soils within the onshore project area, particularly BMV land, a SMP will be secured within the CoCP. The SMP will set out the procedures for the appropriate handling of soils during the construction works Where practicable, agricultural land will be reinstated to pre-construction condition. Where this is not possible, the Project will seek to reach private agreements with relevant landowners/ occupiers. Where land is still not reinstated to its former condition, the Project will have a statutory obligation to pay compensation to landowners under the Compensation Code. An assessment of significance for Agricultural Land Classification (ALC) grades, including BMV agricultural land is provided in Section 22.6.
The general policies controlling development in the countryside apply with equal force in Green Belts but there is, in addition, a general presumption against inappropriate development within them. Such development should not be approved except in very special circumstances. Applicants should therefore determine whether their proposal, or any part of it, is within an established Green Belt and if it is, whether their proposal may be inappropriate development within the meaning of Green Belt policy…. However, infilling or redevelopment of major developed sites in the Green Belt, if identified as such by the local planning authority, may be suitable for energy infrastructure. It may help to secure jobs and prosperity without further prejudicing the Green Belt or offer the opportunity for environmental improvement. Applicants should refer to relevant criteria on such developments in Green Belts.	Paragraph 5.11.20-21	The North Falls onshore project area is not located within Green Belt land.
Paragraph 5.11.34 requires the Secretary of State to ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Where schemes are to be sited on best and most versatile agricultural land the Secretary of State should take into account the economic and other benefits of that land. Where	Paragraph 5.11.34	A detailed site selection process has been undertaken for each element of the Project's onshore infrastructure (landfall, onshore export cables, onshore substation works area), which has included consideration of interactions with BMV. For context, the majority of Essex is agricultural land, of which a large proportion is BMV

NPS requirement	NPS reference	ES reference
development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.		land, therefore interaction between the onshore project area and BMV land is unavoidable. Where works are to take place within BMV, or where BMV is to be lost as part of the Project, this is only considered in situations where no reasonable alternative could be identified when balancing other project engineering and design feasibility, planning and environmental constraints. Description of the Project's site selection process is set out in ES Chapter 4 Site Selection and Assessment of Alternatives (Document Reference: 3.1.6), and assessment of the effects upon BMV is set out in Section 22.6.
NPS for Renewable Energy Infrastructure (EN-3)		
EN-3 contains relevant policy in relation to the assessment of transmission infrastructure for renewable energy installations, however there is no information specific to this land use and agriculture chapter.		
NPS for Electricity Networks Infrastructure (EN-5)		
The Secretary of State should only grant development consent for underground or subsea sections of a proposed line over an overhead alternative if they are satisfied that the benefits accruing from the former proposal clearly outweigh any extra economic, social, or environmental impacts that it presents, the mitigation hierarchy has been followed, and that any technical obstacles associated with it are surmountable. In this context it should consider: …the potentially very disruptive effects of undergrounding on local communities, habitats, archaeological and heritage assets, marine environments, soil (including peat soils), hydrology, geology, and, for a substantial time after construction, landscape and visual amenity. Undergrounding an overhead line will mean digging a trench along the length of the route, and so such works will often be disruptive – albeit temporarily – to the receptors listed above than would an overhead line of equivalent rating);	Paragraph 2.8.9	The onshore cable route site selection process can be split into four phases: Initial cable corridor identification; Combined cable corridor site selection in collaboration with Five Estuaries; Ongoing cable corridor refinement and corridor identification north of the A120, leading to the identification of preferred onshore cable corridor(s) (as assessed in the PEIR); and Identification of an onshore cable route (which forms the basis of the DCO application). The decision to underground the export cables was made during the first stage of the Project's site selection process which is detailed in ES Chapter 4 Site Selection and Alternatives (Document Reference: 3.1.6). Likely significant effects on land taken out of use during construction of the onshore cable route include: • Temporary loss of agricultural land; • Soil degradation; • Soil erosion; • Impacts to agri-environment schemes; and • Disruption of existing utilities. These likely significant effects are discussed further in Section 22.6.

22.4.1.2 Local Planning Policy

19. EN-1 states that the Planning Inspectorate will also consider Development Plan Documents or other documents in the Local Development Framework to be relevant to its decision making.

20. The onshore project area for North Falls is within the administrative area of Essex County Council. There are no relevant land use and agriculture planning policies from Essex County Council.

21. The onshore project area is also within the administrative area of Tendring District Council. Tendring District Council, along with Braintree and Colchester Councils published their local plans in 2017. Due to strategic cross-boundary policies and allocations, Tendring, Braintree and Colchester's Local Plan share an identical Section 1 which was adopted by Tendring District Council in 2021. Section 2 of the Plan sets out strategic planning policies within the Tendring District and how the Local Planning Authority addresses the National Planning Policy Framework (NPPF) on a local basis and was adopted in 2022.

22. The Tendring District Local Plan incorporates core strategies such as Essex Minerals Local Plan (2014) and Essex and Southend-on-Sea Waste Local Plan (more detail on these policies is given in ES Chapter 19 Ground Conditions and Contamination (Document Reference: 3.1.21)). Within this local plan, Policy PP 13 The Rural Economy is relevant to land use and agriculture stating that Tendring Council '*will continue to support proposals for agricultural-related development (where permission is required) provided adverse impacts on the environment are kept to a minimum'*.

22.4.1.3 Other legislation, policy and guidance

23. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of land use and agriculture. These include:

- Marine and Coastal Access Act 2009;
- The Commons Act 2006;
- The Environmental Stewardship (England) Regulations 2005 (as amended);
- Countryside and Rights of Way Act (CRoW) 2000;
- NPPF (2021);
- Natural Environment White Paper 2011; and
- A Green Future: Our 25 Year Plan to Improve the Environment (2018).

24. Further detail is provided in ES Chapter 3 Policy and Legislative Context (Document Reference: 3.1.5).

22.4.2 Data sources

22.4.2.1 Site specific

25. To provide site specific and up to date information on which to base the assessment, an Extended Phase 1 Habitat Survey was undertaken in September, October 2021, March 2022 and August 2023 by Royal HaskoningDHV.

22.4.2.2 Other available sources

26. Other sources that have been used to inform the assessment are listed in Table 22.5 below.

Table 22.5 Other available data and information sources

Data Set	Source	Spatial Coverage	Year	Notes
Road maps, railway lines and urban areas	Ordnance Survey	Landfall, onshore cable route, onshore substation	2020	
Extended Phase 1 Habitat Survey	Royal HaskoningDHV	All habitats within and up to 50m from the boundary of the onshore project area.	2021, 2022 and 2023	
Soil survey of England and Wales	National Soil Resources Institute, Cranfield University	Landfall, onshore cable route, onshore project substation	2023	
ESS	Natural England	England and Wales	2023	Locations and details
CS Schemes	Natural England	England and Wales	2023	Locations and details
Agricultural Land Classifications	Natural England	Essex	2023[2]	Locations and details
Common Land	Natural England	England and Wales	2023	Locations and details
Utilities	Atkins	Onshore project area	2022	Locations and details

22.4.3 Impact assessment methodology

27. ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) explains the general impact assessment methodology applied to North Falls. The following sections describe the methods used to assess the likely significant effects on land use and agriculture.

22.4.3.1 Definitions

28. For each potential impact, the assessment identifies receptors within the onshore project area which are sensitive to that impact and implements a systematic approach to understanding the impact pathways and the level of impacts (i.e. magnitude) on given receptors. The definitions of sensitivity and magnitude for the purpose of the land use and agriculture assessment are provided in Table 22.6, Table 22.7 and Table 22.8.

29. For the purpose of defining receptor sensitivity and impact magnitude, two key groups of impacts have been identified:

    - Agriculture and soils: The potential impacts on the soil as a receptor itself, including the bio-physical elements of soils, the surrounding environment, and the agricultural productivity of the land. The presence of potentially contaminated soils is considered separately in ES Chapter 19 Onshore Ground Conditions and Contamination (Document Reference: 3.1.21).

[2] Original data dated 1967-74

- Land use: The potential impacts of the Project on the continuation of the current land use (agricultural, environmental stewardship, CS, public access, planning policy, etc.).

30. For the purpose of this chapter, temporary impacts during the construction stage have been considered for the following project components:

- Onshore cable route (including areas subject to trenching, haul roads, access, TJBs and trenchless crossings);
- TCCS;
- Off route haul roads;
- Bentley road improvement works (non-motorised user route); and
- Landfall compound.

31. Permanent impacts during the operational stage have been considered for:

- Onshore cable route (link boxes only);
- Bentley road improvement works; and
- Onshore substation (including drainage, access, landscaping, environmental mitigation and ancillary works).

32. It is assumed that, as a worst case, the land take for the onshore substation (including the onshore substation footprint, drainage, access, landscaping, environmental mitigation and ancillary works) would not be returned to its previous use following the construction stage. As a result, this would be considered a permanent impact from a loss of agricultural land perspective and is therefore considered in the operational stage assessment only.

33. Approximately 7.64ha of land has been included in the onshore project area for Operation and Maintenance (O&M) access routes. North Falls does not intend to alter the footprint of private road accesses as part of the works. As no impacts to land use and agriculture are anticipated, O&M accesses are not considered further in this assessment.

22.4.3.1.1 Sensitivity

34. Table 22.6 outlines the criteria to which the sensitivity of each receptor is assessed. This is based on the capacity of receptors to tolerate change and is used to determine if the degree of change would be acceptable in terms of the current legislation and guidelines.

Table 22.6 Definition of sensitivity for a land use and agriculture receptor

Sensitivity	Definition	
	Land Use	**Agriculture & Soils**
High	Receptor has no or very limited capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	Planning policy areas designated at national and international scale; • Higher level ESS; Higher tier CS; • Future large-scale planning use applications; or	Land at ALC Grades 1, 2 or 3a (agricultural land designated as Best and Most Versatile (BMV); • Land with Notifiable Weeds and/or Notifiable Scheduled Diseases that are at risk of spreading;

Sensitivity	Definition	
	• Regionally distinctive and rare land uses that cannot be replaced or adapted.	• Soil which is susceptible to structural damage and erosion; or • Unrecoverable or unadaptable soil.
Medium	Receptor has limited capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	• Locally designated planning policy areas; • Entry level ESS; Mid-Tier and Wildlife Offers CS Schemes; or • Land used for specific and regionally important agriculture or horticulture.	• Soil which is vulnerable to seasonal structural damage or erosion. • Land at ALC Grade 3b (non-BMV land)
Low	Receptor has moderate capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	• No impact on designated planning policy areas; • Not under ESS, but is subject to other environmental management schemes (such as CS Scheme capital grants); • Large agricultural holdings; or • Land used for ordinary agriculture or horticulture.	• Land at ALC Grade 4 (Poor Quality agricultural land); • Arable or pasture grassland; or • Medium to coarse soil with some resistance to structural damage.
Negligible	Receptor generally tolerant of changes such as loss of recreational activity/area, loss of land area, soil degradation etc.	
	No ESS or other environmental management schemes (such as CS Schemes).	• Land at ALC Grade 5 (Very Poor Quality agricultural land) or Urban; • Land which is not agricultural, arable or pasture grassland; or • Soil with a greater resistance to structural damage.

35. The ALC grades and descriptions following MAFF (1988) Agricultural Land Classification of England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land (Revised Guidelines) are shown in Table 22.7.

36. The ALC ranks land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. It provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system, and in turn, underpinning the principles of sustainable development. The ALC system classifies land into the five grades outlined below. Grade 3 land can be subdivided into 3a (good) and 3b (moderate).

37. BMV land is the land which is most flexible, productive and efficient and which can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals. It is defined as Grades 1, 2 and 3a (excellent to good quality agricultural land) by policy guidance. Grades 3b, 4, 5, urban and non-agricultural land are defined as non-BMV land.

Table 22.7 ALC grades and descriptions (MAFF, 1988)

Grade	Description
Grade 1: Excellent quality agricultural land	Land with little or no limitations to agricultural use. Land can support a very wide range of agricultural and horticultural crops with consistently high yields. Crops commonly include top fruit, soft fruit, salad crops and winter harvested vegetables.
Grade 2: Very good quality agricultural land	Land with minor limitations which can affect crop yields, cultivations or harvesting. This land can support a wide range of agricultural and horticultural crops. Reduced flexibility can lead to difficulties in the production of more demanding crops such as winter harvested vegetables and arable root crops. Whilst the yield is high, it may be lower or more variable than Grade 1 land.
Grade 3: Good to Moderate quality agricultural land	Land with moderate limitations which can affect the type of crops to be grown, timing and method of cultivation, harvesting and/or the level of yield. More demanding crops generally have a lower or more variable yield than on Grade 1 and 2 land.
Subgrade 3a – Good quality agricultural land	Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Subgrade 3b – Moderate quality agricultural land	Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.
Grade 4: Poor quality agricultural land	Land with significant limitations that considerably restrict the type and/or yield of crops that can be grown. Grass with occasional arable crops (e.g. cereals and forage crops) are predominantly suited to this land and produce variable yields.
Grade 5: Very poor quality agricultural land	Land with very severe limitations, restricting use to permanent pasture or rough grazing, with the exception of occasional pioneer forage crops.
Urban	Built-up urban areas with 'hard' uses such as housing, industry, commerce, education etc. with little potential to restore land after use.
Non-agricultural	'Soft' use areas such as golf courses, private parklands, public open spaces and sports field that can be returned to agriculture relatively easily.

22.4.3.1.2 Magnitude

38. The magnitude of an impact on a receptor is defined based on the spatial extent, duration, frequency and severity of the effect. The potential impacts may be adverse, beneficial or neutral.

39. Impact magnitude is assessed according to the criteria defined in Table 22.8.

Table 22.8 Definition of magnitude for land use and agriculture

Magnitude	Definition	
	Land Use	Agriculture & Soils
High	• Permanent (>10 years) / irreversible changes, over the whole receptor, affecting usability, risk, value over a wide area, or certain to affect regulatory compliance; or • Existing land use would not be able to continue on >5ha of land or the entire landowner/occupiers available land (where smaller) where the land would be rendered unviable for agricultural purposes or permanent changes to land management would be required.	• Permanent loss (+10 years) of >20ha of Grade 1, 2 or 3 agricultural land or >60% total Essex regional resource (Natural England, 2012); or • Full land recovery in excess of 10 years.

Magnitude	Definition	
	Land Use	Agriculture & Soils
Medium	• Moderate, permanent or long-term (5-10 years) reversible changes, over the majority of the receptor, affecting usability, risk, value over the local area, possibly affecting regulatory compliance; • Existing land use would not be able to continue on <5ha of land; or • Noticeable changes to the existing land use.	• Medium to long term (2 - 10 years) loss of >20ha of Grade 1, 2 or 3 agricultural land or >60% of the total Essex regional resource; • Permanent loss of >10ha of Grade 1, 2 or 3 agricultural land; • Full land recovery expected within 5 - 10 years; • >20ha of soil is temporarily (<2 years) unsuitable for agriculture; or • <10ha of any agricultural land permanently lost from agriculture.
Low	• Temporary change affecting usability, risk or value over the short-term (<5 years); or • Temporary change affecting usability within the site boundary; measurable permanent change with minimal effect on usability, risk or value; no effect on regulatory compliance.	• Short term (<2 years) loss of >20ha, or permanent loss of >10ha of Grade 4 land or >10% of Essex's regional resource; • Full land recovery expected within 5 years; or • <20ha of soil is temporarily unsuitable for agriculture or <1ha is permanently lost from agriculture.
Negligible	• Minor permanent or temporary change, undiscernible over the medium- to short-term, with no effect on usability, risk or value.	• No identifiable material change to the soil resource; or • Small areas <1,000m2 is permanently lost from agriculture.

22.4.3.2 Significance of effect

40. The assessment of significance of an effect is a function of the sensitivity of the receptor and the magnitude of the impact (see ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) for further details). The determination of significance is guided by the use of a significance of effect matrix, as shown in Table 22.9. Definitions of each level of significance are provided in Table 22.10.

41. Should major or moderate effects be identified within the assessment, these would be regarded within this chapter as significant. Should the assessment indicate any likely significant effect, mitigation measures would be identified, where possible, in consultation with the regulatory authorities and relevant stakeholders. The aim of mitigation measures is to avoid or reduce the overall significance of effect to determine a residual effect upon a given receptor.

Table 22.9 Significance of effect matrix

		Adverse magnitude			Beneficial magnitude				
		High	Medium	Low	Negligible	Negligible	Low	Medium	High
Sensitivity	High	*Major*	*Major*	*Moderate*	*Minor*	*Minor*	*Moderate*	*Major*	*Major*
	Medium	*Major*	*Moderate*	*Minor*	*Minor*	*Minor*	*Minor*	*Moderate*	*Major*
	Low	*Moderate*	*Minor*	*Negligible*	*Negligible*	*Negligible*	*Minor*	*Minor*	*Moderate*
	Negligible	*Minor*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Minor*

Table 22.10 Definition of effect significance

Significance	Definition
Major	Very large or large change in receptor condition, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or could result in exceedance of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in receptor condition, which are likely to be important considerations at a local level.
Minor	Small change in receptor condition, which may be raised as local issues but are unlikely to be important in the decision-making process.
Negligible	No discernible change in receptor condition.
No change	No impact, therefore, no change in receptor condition.

42. Where the need for additional mitigation has been identified specifically to reduce or eliminate any predicted likely significant effects, this has been proposed in consultation with the appropriate regulatory authorities and relevant stakeholders. The aim of additional mitigation measures is to avoid or reduce the overall significance of effect to determine a residual effect upon a given receptor. Residual effects are summarised in Table 22.26.

43. In addition, whilst minor impacts are not significant in their own right, it is important to distinguish these from other non-significant impacts as they may contribute to significant impacts cumulatively or through interactions.

22.4.4 Cumulative effects assessment methodology

44. The CEA considers other plans, projects and activities that may result in cumulative impacts on receptors with North Falls. ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) provides further details of the general framework and approach to the CEA.

45. For land use and agriculture, these activities include other large-scale linear projects such as cable installations for other offshore wind farms; large-scale housing projects; large scale commercial and industrial projects, changes to infrastructure and community facilities and changes to agricultural land use.

22.4.5 Transboundary effects assessment methodology

46. The transboundary assessment considers the potential for transboundary effects to occur on land use and agriculture receptors as a result of North Falls; either those that might arise within the Exclusive Economic Zone (EEZ) of European Economic Area (EEA) states or arising on the interests of EEA states e.g. a non UK fishing vessel. ES Chapter 6 EIA Methodology (Document Reference: 3.1.8) provides further details of the general framework and approach to the assessment of transboundary effects.

47. For land use and agriculture, there is no potential for transboundary effects and it has been scoped out of the assessment.

22.4.6 Assumptions and limitations

48. Likely significant effects upon receptors are based on a quantitative assessment where practicable, as outlined in Table 22.6 and Table 22.8, in order to predict the effect on land use and agricultural activities, particularly during the construction phase. However, it is accepted that perceptions, particularly with respect to receptor sensitivity, may differ between individuals. The assessment undertaken within this chapter is based on expert judgement by competent professionals experienced in undertaking EIA, as set out in ES Chapter 1 Introduction (Document Reference: 3.1.3) and is therefore considered to be a robust assessment of the likely effects identified.

49. The baseline environment in terms of agricultural land cover, includes the crops grown and agricultural practices adopted where these are known. It should be noted that this assessment is based on high level datasets which are only accurate at the time of data collection, and therefore should only be considered indicative of the land uses found within the study areas.

50. Likely impacts and effects on soil resources are not predicted to extend beyond the direct study area (onshore project area). Therefore, any likely impacts and effects to the wider area are not discussed here. The published soil data used to undertake this study provide a generalised overview of the onshore projects area's soil characteristics. The specific characteristics may differ on the ground and can vary between individual fields. However the published soils data is considered sufficient to inform the assessment presented within this chapter.

51. ALC surveys are not proposed to be undertaken to inform the baseline, as the value of these is only in differentiating between ALC Grade 3a and 3b, and for the purposes of assessment, as a worst case all Grade 3 land is assumed to be BMV (i.e. 3a) due to the surrounding areas being classified as Grades 1 and 2 BMV land.

52. Soil sampling will be undertaken during pre-construction to better inform the desk-based assessment. The requirement to undertake soil surveys will be secured within the SMP of the CoCP.

22.5 Existing environment

53. This section describes the existing environment in relation to land use and agriculture. It is based on desk-top study of data sources outlined in Table 22.5 as a basis for the environmental impact assessment.

54. Essex is a rural county in which over 68% of the county is graded agricultural land not included as part of green infrastructure. The major land use in rural areas of Essex is agriculture which has considerable influence on landscape character and natural habitats (Green Essex, 2019). The distribution of land use types within the study area is shown in ES Figure 22.2 (Document Reference: 3.2.18).

55. Essex retains many historic landscape features and has one of the longest coastlines in the country, much of which is of international significance for wildlife. The Greater Essex coast is extremely diverse in nature, varying from a largely open rural landscape with numerous historic and archaeological features, to the more heavily built-up environment which exists around Harwich Port and Clacton.

56. Essex is also a highly valued water and land-based resource providing opportunities for recreation, tourism, agriculture, shellfisheries and many other forms of employment. The county is broadly an open maritime landscape of marshes, creeks and eroding cliffs.

57. Table 22.11 below shows the broad habitats that make up the landscape and land use of Essex.

Table 22.11 Land use and landscape of Essex (Place Services, 2017)

Broad Habitat (Grasslands merged)	Area (ha)
Arable and Horticulture	210,328.04
Broad leaved, mixed and yew woodland	23,719.07
Built up areas and gardens	33,491.83
Coniferous woodland	949.83
Heathland	31.37
Fen marsh and swamp	2.85
Open freshwater	2,864.04
Improved grassland	66,162.59
Inland rock	670.20
Littoral rock	73.06
Littoral sediment	9,320.41
Salt water	1,697.77
Supra-littoral sediment	34.48
Grassland with conservation value	7,408.67

58. Urban areas including Southend-On-Sea, Colchester and Chelmsford are adjacent to, but outside of, the onshore project area.

59. The landfall, onshore cable route and onshore substation are all located within primarily agricultural land, with some areas of improved or semi-improved grassland, mixed deciduous woodland, coniferous plantations, hedgerows and waterbodies. Further information on the habitats and ecology of the onshore project area can be found in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25).

22.5.1 Agriculture and Soils

22.5.1.1 Agricultural activities

60. Farming is a major part of the Essex economy growing £400 million worth of produce and employing over 8,000 people in the county (Essex County Council, 2022).

61. Almost 75% of the county's land area is farmland with 5,000 hectares of land used to grow outdoor vegetables.

62. Predominant farming types in the East of England region in 2019 were cereal farms which accounted for 51% of farmed area in the region and general cropping farms which covered an additional 33% of farmed area.

63. Arable farming is common throughout Essex, with cereal crops dominating the farmed landscape. Farm sizes range from less than 5ha to more than 100ha (Defra, 2021). Crops grown include cereals and combinable crops (wheat, barley, and oil seed rape) (Defra, 2021).

64. The total area of BMV within Essex is 299,028.39ha (Defra, 2017).

22.5.1.2 Agricultural Land Classification

65. Agricultural land in England and Wales has been defined according to the ALC which measures the quality and versatility of soil in a grading system, and is based on factors including climate, nature of the soil and site-based factors (MAFF, 1988). The grading system is described in Table 22.7.

66. The percentage of land of different ALC grades within the onshore project area is presented in Table 22.12.

Table 22.12 ALC grades within the onshore project area

ALC Grade	Land comprised of ALC within the onshore project area (ha)	% ALC Grade land within the onshore project area
1	103.61	26.95
2	78.45	20.40
3	159.4369	41.46
4	42.79	11.13
Urban	0.02	0.004

67. The onshore project area primarily consists of ALC Grade 3 (159 ha, 41.46% of the onshore project area), but ranges from Grade 1 to Grade 4 and includes some areas of urban land (see ES Figure 22.4 (Document Reference: 3.2.18)). The landfall at Great Holland crosses ALC Grade 4 land. The onshore project

area does not cross any ALC Grade 5 land. The onshore substation works area is located within ALC Grade 1 land.

68. While Table 22.6 defines Grade 3a as a high sensitivity receptor (BMV land) and Grade 3b as a medium sensitivity receptor (non-BMV land), it should be noted that the national dataset used to identify the presence of ALC land (Natural England's Provisional Agricultural Land Classification) does not differentiate between Grade 3a (land considered BMV) and Grade 3b (non-BMV land). For context, a proportion of the onshore project area comprises Grades 1 and 2 BMV agricultural land (182.06 ha, 47.35% of the onshore project area). Therefore this chapter assumes that all Grade 3 land within the onshore project area is conservatively assessed as Grade 3a (BMV land) as a worst case scenario.

22.5.1.3 Soil type

69. This section provides a description of the soils found within the onshore project area, including the type, drainage, texture, fertility and moisture.

70. Reference should be made to ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23) for further details on soils in relation to flood risk and water. Any impact on the soil resource is not predicted to extend beyond the onshore project area. It should be noted that the published soil data provide generic characteristics and is indicative of the soil type present. The precise soil type and characteristics may differ between and within individual fields and will be captured within the SMP.

71. The soils within the onshore project area range from slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils to loamy and clayey soils of coastal flats with naturally high groundwater. The onshore project area is dominated by slightly acidic loamy soils in the north and slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils in the south.

72. The soils around the landfall primarily consist of loamy and clayey soils of coastal flats with naturally high groundwater.

73. The soils around the onshore substation works area consist of slightly acidic loamy and clayey soils with impeded drainage.

74. The soils along the onshore cable route are predominantly of moderate to high natural fertility (without the addition of fertilisers), owing to the slightly acidic but base-rich nature of the soils.

75. The distribution of soil types within the study area is shown on ES Figure 22.5 (Document Reference 3.2.18).

76. Table 22.13 provides additional detail on the characteristics of the soil types identified within the onshore project area using the Cranfield Soilscapes Viewer (Cranfield University, 2024).

Table 22.13 Soil types within the onshore project area

Soil characteristics	Soil description
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils	
Texture	Loamy and clayey
Drainage	Impeded drainage
Natural Fertility	Moderate
Typical Habitats	Seasonally wet pastures and woodlands
Landcover	Grassland and arable, some woodland
General cropping	Mostly suited to grass production for dairy or beef; some cereal production often for feed. Timeliness of stocking and fieldwork is important, and wet ground conditions should be avoided at the beginning and end of the growing season to avoid damage to soil structure. Land is tile drained and periodic moling or subsoiling will assist drainage.
Area (ha) within onshore project area	106.69
Percentage (%) of the onshore project area	27.75
Slightly acid loamy and clayey soils with impeded drainage	
Texture	Loamy some clayey
Drainage	Slightly impeded drainage
Natural Fertility	Moderate to high
Typical Habitats	Wide range of pasture and woodland types
Landcover	Arable and grassland
General cropping	Reasonably flexible but more suited to autumn sown crops and grassland; soil conditions may limit safe groundwork and grazing, particularly in spring.
Area (ha) within onshore project area	236.25
Percentage (%) of the onshore project area	61.44
Loamy and clayey soils of coastal flats with naturally high groundwater	
Texture	Loamy and clayey
Drainage	Naturally wet
Natural Fertility	Lime-rich to moderate
Typical Habitats	Wet brackish coastal flood meadows
Landcover	Arable, some grassland
General cropping	Lighter soils support a wide range of crops and are highly productive as they contain much available water and are stoneless and flat. Heavier soils are less easily worked and favour grass.
Area (ha) within onshore project area	38.64

Soil characteristics	Soil description
Percentage (%) of the onshore project area	10.05

22.5.1.4 Soil natural capital, ecosystem services and carbon resource

77. The concepts of 'natural capital' and 'ecosystem services' are used to bring together scientific and economic considerations so that the potential impact of ecosystem modification and the way it may affect society can be assessed more fully. Natural capital in the context of soils can be considered in terms of the mass, energy and entropy (organisation) stored within the soil. Soil ecosystem services refer to the functions and processes through which the soils produce resources used by humans. These are summarised in Table 22.14.

Table 22.14 Soil natural capital and ecosystem services

Mass (constituents of soil matrix)	Description
Mass (constituents of soil matrix)	Inorganic content (minerals and nutrients); organic content (carbon and organisms); water; and air.
Energy	Temperature and biomass.
Entropy (organisation)	Soil physical and chemical structure; organisation of biological populations, food webs and biodiversity; and spatial and temporal structure.
Soil Ecosystem Services	**Description**
Support functions	Supporting food and fibre production, ecological habitat and diversity through: physical stability and medium for supporting plants; supply of plant nutrients; and role as habitat and gene pool/seed bank.
Regulation functions	Regulation of major elemental cycles – macronutrients (N, P and K) and micronutrients; regulation and buffering of the hydrological cycle and attenuation of pollutants; and regulation/cycling of organic matter (waste decomposition and carbon cycle).
Provisioning functions	Use as a raw material for development; and providing a platform for development.
Cultural functions	Repository for, and protection of, archaeological artefacts and structures of heritage value; and location of religious/spiritually significant sites/structures (e.g., burial grounds).

78. Soils have a large reserve of organic carbon, which may be lost as a result of land use change and changes as a result of human activity (including climate change), resulting in the release of greenhouse gases. This may also affect other ecosystem services such as food security, biodiversity and storage of water. Conversely, agricultural management practices and the use of waste materials may allow more carbon to be stored in soils. It should be noted, however, that currently evidence of a direct linkage between land management activities, changes in soil carbon and greenhouse gas emissions is poor. The highest concentration of carbon storage is in blanket peats. These are not found within the onshore project area.

79. Carbon in live vegetation is estimated to account for five percent or less of the UK land carbon stock, of which forests and woodland (including natural woodland and plantations) account for approximately 80% (Ostle *et al*., 2009).

22.5.2 Land Use

80. The land use within the onshore project area primarily comprises of agricultural land, some of which is enrolled on Agri-environment schemes. The onshore project area overlaps nationally important designations and landscapes. This section also considers utilities that intersect the onshore project area.

22.5.2.1 Land use and agriculture policies and designations

81. A review of Tendring District Council Local Plan (2021) and Essex Green Infrastructure Strategy (2020) was undertaken to identify any areas of land that are allocated for, or restrict, future development or change of use. This included a review of site allocation maps for Tendring District Council.

82. The onshore project area overlaps with the Holland Haven Country Park, Holland Haven Local Nature Reserve and Holland Haven Marshes SSSI. This site is located along the coast between Clacton-on-Sea and Frinton-on-Sea (as illustrated on ES Figure 23.1 (Document Reference: 3.2.19)).

83. Essex has over 1,600 LoWS, which play a key role in the conservation of Essex's biodiversity. A LoWS designation is non-statutory but it recognises the value of a site for wildlife. Many sites are of county value and some are of regional importance. They are often designated because they support characteristic or threatened species or habitats. Sites may be privately or publicly owned and vary in size and shape from small meadows, green lanes, dykes and hedges to much larger areas of ancient woodlands, heathland, greens, commons and marsh.

84. The onshore project area borders Simon's Wood LoWS (Thorpe-Le-Soken district) and Great Holland Pits Local Wildlife Trust site. These sites are discussed further in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25).

85. The onshore project area does not cross through any preferred sites allocated for housing, commercial, employment or special policy under Tendring District Council (adopted 2022).

22.5.2.2 Agri-environment schemes

86. Agri-environment schemes require land managers, including farmers, to implement environmentally beneficial management and to demonstrate good environmental practice on their land.

87. The ESS allows farmers, tenants and other land managers to receive payment for their environmental land management. The scheme is an agri-environmental scheme that aims to:

- Conserve wildlife and biodiversity;
- Maintain and enhance landscape quality and character;
- Protect natural resources;

- Promote public access; and
- Provide flood management (Defra, 2019).

88. The scheme was launched in March 2005 to build on the Environmentally Sensitive Area Scheme, CS Scheme and the Organic Farming Scheme that were running prior to 2005. The ESS is administered by Natural England on behalf Defra.

89. The scheme has been built into the following three levels:

- Entry Level Stewardship (ELS): simple and effective environmental management open to all farmers and land managers;
- Organic Entry Level Stewardship (OELS): As ESS, but open to farmers or land managers whose land is either wholly or partly managed organically;
- Higher Level Stewardship (HLS): more complex types of management and agreements which aims to provide significant environmental benefits to priority areas and is tailored to local circumstances.

90. CS has replaced the ESS. The overarching aim of CS is to look after and improve the environment by conserving and restoring wildlife habitats, managing flood risk, creating and managing woodland, and reducing agricultural water pollution.

91. Similar to the previous ESS, CS is divided into a number of elements, including:

- Mid-Tier – These are multi-year agreements that focus on widespread environmental issues, such as reducing water pollution or improving the farmed environment for farmland birds and wild pollinators.
- Wildlife Offers – These are multi-year agreements with a range of highly targeted and effective options which include creating sources of nectar and pollen, winter food for seed-eating birds and improved habitats. The offers are tailored to specific farming practices.
- Higher Tier – These are multi-year agreements for the most environmentally important sites, including commons and woodlands. These are usually in places that need complex management, such as restoring habitats, and improving woodland.
- Capital Grants – These are typically for two years and there are four different options available:
    - Hedgerows and boundaries – capital grant to restore existing farm boundaries;
    - Woodland Management Plans – one-off payment to support the production of UK Forestry Standard compliant 10-year woodland management plan;
    - Woodland Tree Health – one-off payment to restock or improve woodland due to tree health problems; and
    - Woodland creation grant – two-year capital grant to plant and protect young trees.

92. Environment Land Management schemes (ELMS) were planned from 2022 (although they have yet to be implemented) and will eventually replace CS. Three new schemes have been developed to support and reward environmental land management and the rural economy, whilst also contributing to government targets and commitments to net zero emissions by 2050. These schemes include:

- Sustainable Farming Incentive;
- Local Nature Recovery Scheme; and
- Landscape Recovery Scheme.

93. The location and area of the agri-environment schemes within the onshore project area are shown in ES Figure 22.3 (Document Reference: 3.2.18) and Table 22.15.

Table 22.15 Agri-environment schemes within the onshore project area

Scheme	Count	Area (Ha) of ESS within the onshore project area	% of the onshore project area
Entry Level Stewardship	N/A	N/A	N/A
Entry Level plus Higher Level Stewardship	2	43.76	11.38
Higher Level Stewardship	N/A	N/A	N/A
Organic Entry Level Stewardship	N/A	N/A	N/A
Organic Entry Level plus Higher Level Stewardship	N/A	N/A	N/A
CS Mid-Tier	6	92.94	24.17
CS Higher Tier	3	29.48	7.67
CS Wildlife offers	N/A	N/A	N/A
CS Capital grants	1	30.19	7.85

94. The onshore substation works area is situated on a Mid-Tier CS and the landfall section of the onshore cable route crosses two Entry Level plus Higher Level Stewardship Scheme agreement. The onshore cable route also crosses six Mid-Tier, three Higher Tier and one Capital Grant CS. Therefore, it is anticipated that elements of construction, operation and decommissioning of the onshore substation and the onshore cable route, such as cable trenching and cable installation could potentially affect land subject to an agri-environment scheme.

22.5.2.3 Injurious weeds and invasive species

95. Invasive non-native species represent a significant threat to native biodiversity and can lead to severe adverse environmental and economic impacts. An Extended Phase 1 Habitat Survey was undertaken in September 2021, October 2021, March 2022 and August 2023 by Royal HaskoningDHV which recorded giant hogweed *Heracleum mantegazzianum* within the survey area and one ditch contained water fern *Azolla filiculoides* over approximately a five-metre length (see ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25)).

22.5.2.4 Utilities

96. There are a number of utilities identified throughout the onshore project area. These include major and minor (domestic) utilities, which are primarily routed under the public highway.

97. The majority of the identified utilities crossing the onshore project area are for domestic services that include telecommunications, electricity, water, gas, sewage, unspecified pipeline and street lighting. There is a major Affinity Water main that runs parallel to the onshore project area for approximately 12km between Great Holland and the A120. Cognisance of this water main has been a key consideration during the Project's site selection in this area.

98. The landfall overlaps with the existing Gunfleet Sands Offshore Wind Farm (OWF) underground transmission cable at landfall (near Holland-on-Sea). ES Figure 22.6 (Document Reference: 3.2.18) provides detail of the utilities of major and national importance that cross the onshore project area. It should be noted that the landfall is much larger than the actual land area that will be affected by onshore infrastructure.

22.5.2.5 Open access and common land

99. Under the CRoW Act 2000 the public are not restricted to paths, but can freely walk on mapped areas of mountain, moor, heath, downland and registered common land, known as open access land.

100. There are no areas of open access and common land within the footprint of the onshore project area, and these land use types are therefore not considered further within this chapter.

101. Although not classified as open access land, the beach and intertidal area between Clacton-on-Sea and Frinton-on-Sea will have underground cables associated with the Project installed under this land use type.

102. PRoWs are considered further in ES Chapter 32 Tourism and Recreation (Document Reference: 3.1.34).

22.5.3 Future trends in baseline conditions

103. In the event that North Falls is not developed, an assessment of the future conditions for land use and agriculture has been carried out and is described within this section. With no development, baseline conditions will continue to change following natural trends and increasing influence from climate change.

104. Essex is one of the top 10 areas at risk of surface water flooding in the UK. The number of houses in Essex at risk from surface water flooding, river flooding and flooding associated with sea level rise are summarised in Table 22.16.

Table 22.16 Houses at risk from flooding in Essex

Type of flood risk	Number of houses at risk
Surface water	36,000
Rivers	10,000
Sea	50,000

105. The Essex coastal estuaries are important for UK biodiversity and these areas may be the most affected by coastal change. Coastal zones, semi natural grasslands, wetlands and freshwater habitats are particularly vulnerable to changes in water availability and species range shifts. Biodiversity is likely to face increasing pressure due to changes in soils and invasion of non-native species and diseases.

106. In general, Essex can expect more frequent extreme weather events (including storms, extreme cold weather) and milder and wetter winters as well as hotter, drier summers by 2080.

107. If no action is taken to address climate change in Essex, under a high emissions scenario, the county is likely to face climate change challenges including:

- Increasing mean seasonal temperatures across the region (UKCP18 projections)
- Changes in seasonal precipitation (increased precipitation during winter months and decreased precipitation during summer months) (UKCP18 projections)
- Water scarcity – with water demand in Essex likely to exceed a 200% negative available resource for abstraction by 2050 (HR Wallingford, 2017 (CCRA2))
- Degradation and erosion of agricultural soils due to changing climate conditions leading to a reduction in ALC grades overtime (Defra, 2015); and
- Rising sea levels (UKCP18 projections).

108. One of the recommendations raised by Szewczyk *et al.* (2020) is for farmland in Essex to adopt Sustainable Land Stewardship practices: 50% by 2030; 75% by 2040 and 100% by 2050. Agricultural production can either deplete or increase carbon stocks, therefore adopting sustainable land stewardship has the potential to:

- Absorb carbon by increasing organic matter in plants, roots and soils; and
- Lower carbon use through increased productivity, often using less artificial inputs.

109. The adoption of sustainable land stewardship will have associated benefits for biodiversity and water quality.

110. Agriculture and land use contribute 24% of carbon dioxide equivalent (CO_2eq) emissions (Intergovernmental Panel on Climate Change (IPCC), 2019). There are various strategies for lowering global carbon emissions from agriculture and land use by changing land management practices, which are summarised in Table 22.17).

Table 22.17 Examples of carbon sequestration by agriculture and land use

Carbon sequestration by agriculture and land use	Example carbon sequestration methods
Sustainable Land Stewardship	Silvopasture (trees with grazing)
	Agroforestry and tree intercropping
	Organic and regenerative agriculture

Carbon sequestration by agriculture and land use	Example carbon sequestration methods
	Cover crops (legumes, clovers)
	Zero tillage and conservation agriculture
	Reduced nitrogen use
	Integrated nutrient management for nitrogen
	Integrated pest management (cut pesticides)
	Industry good practice slurry and animal waste use
	Improved grazing by rotational grazing
Natural Green Infrastructure	Land for biodiversity and rewilding
	Natural Urban Habitats
	Peatland
	Existing forest/woodland
	Saltmarsh

111. The baseline review of land use and agriculture in Section 22.5 above shows that the predominant land use in the area of the onshore project area is arable or mixed use agricultural, with some areas of improved or semi-improved grassland, mixed deciduous woodland, coniferous plantations, hedgerows and waterbodies.

112. ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25) notes that species associated with farmland environments have declined over the short and long term, with farmland birds and butterflies both declining. Soil erosion is expected to occur naturally over time, depending on weather conditions (exacerbated by climate change) and farming practices.

113. Consequently, the quality and availability of agricultural land could reasonably be expected to decline over time, with some potential offsets by advances in agricultural innovations and technology.

22.6 Assessment of significance

114. The following sections describe the effects upon those land use and agriculture receptors described in Section 22.5 that have the potential to arise because of the construction, operation, and decommissioning phases of the Project. The assessment follows the methodology set out in Section 22.4.3. The assessments are based on the realistic worst-case scenario set out in Section 22.3.2 and include the incorporation of embedded mitigation set out in Section 22.3.3.

22.6.1 Likely significant effects during construction: Agriculture

22.6.1.1 Impact 1: Agricultural drainage

115. There is the potential for the earthworks associated with the construction of the landfall and onshore cable route to impact the natural and artificial field drainage systems within the onshore project area. These systems, both natural and artificial, play an important role by ensuring soils remain aerated and reduce the

risks associated with surface water flooding in the agricultural land itself and surrounding environment.

116. Existing field drains are expected to be made of ceramic and plaster and are typically found at a depth between 0.5-1.5m. As such, it is likely that the drains would be impacted by any excavation works through agricultural fields. More information regarding the local drainage system is provided in ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23).

117. Duct installation requires the excavation of the cable trench and stockpiling of soils and has the potential to cause an adverse impact to the field drainage systems. Soil types found within the onshore project area are mostly loamy and clayey soils. It will be necessary to truncate the drainage systems temporarily during excavation and installation of the ducts, install temporary drainage systems and reinstate drainage post-construction.

118. At the onshore substation any existing field drainage would be permanently altered as land would be taken out of use during the operation of the Project. Therefore, agricultural drainage is not considered a temporary impact during construction and is discussed further in Section 22.6.3, as an operational impact.

119. Embedded mitigation measures (as detailed in Table 22.3) will be utilised to reduce the magnitude of the impact on agricultural drainage and include:

- Maintaining and reinstating land drainage systems during and following construction;
- The provision of a specialised drainage contractor (to undertake surveys and create drawings pre- and post-construction, to locate land drains and ensure appropriate reinstatement);
- The implementation of the final CoCP.

120. The embedded mitigation measures outlined above will ensure ongoing drainage of the surrounding agricultural land, in order to avoid any material change to the soil resource.

22.6.1.1.1 Magnitude of impact

121. Taking into account the embedded mitigation, the magnitude of the impact for the onshore cable route and landfall would be low due to the temporary change affecting the usability of >20ha soil and associated land drains (<2 years) across the onshore project area for agriculture. This is because agricultural land drains will only potentially be disrupted during the installation of the onshore cable route in a single operation.

122. The onshore cable route works are expected to take up to 27 months. However, as is the norm for a linear project, the cable duct installation works would be a continuous activity with a ‘work front’, with installation being undertaken within one section of the onshore cable route before moving on to the next. In any given location, once the cable ducts have been installed the trenches would be backfilled and the work front would continue moving onto the next section. This would minimise the amount of land being worked on at any one time. As such, disturbance at any one location is considered to be short term (<2 years duration).

22.6.1.1.2 Sensitivity of receptor

123. Soil types found within the onshore project area are mostly slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils. Field drainage networks, some of which are unmapped and informal, are considered to have a medium sensitivity overall, as they have a limited capacity to accommodate changes such as degradation or poor reinstatement of drainage systems.

22.6.1.1.3 Significance of effect

124. Given the low magnitude of impact and the medium sensitivity of the receptor, this represents a **minor adverse** effect during construction on agricultural drainage which is not significant in EIA terms.

22.6.1.2 Impact 2: Temporary loss of agricultural land

125. Construction activities within the onshore project area have the potential to either directly take land out of existing use or isolate land which would effectively take it out of use temporarily during the construction period. This would also result in loss of growing seasons during the construction period in the land directly taken out of production and the loss of associated productivity and agricultural related income. For agricultural land isolated during the construction of the onshore cable route, the effect would be up to 27 months in total. However, as is the norm for a linear project, the cable duct installation works would be a continuous activity with a 'work front', with installation being undertaken within one section of the onshore cable route before moving on to the next. In any given location, once the cable ducts have been installed the trenches would be backfilled and the work front would continue moving onto the next section. This would minimise the amount of land being worked on at any one time. As such, disturbance at any one location is considered to be short term (<2 years duration).

126. Construction activities also have the potential to cause compaction of soil and hinder future agricultural productivity through the use of heavy machinery and disturbance.

127. The majority of the construction footprint would be within areas currently associated with agricultural production. The footprint of the onshore cable route, including temporary construction compounds and construction accesses (including the Bentley Road improvement works) would all contribute to the temporary loss of land for agriculture, as well as the temporary compounds associated with HDD.

128. As the cable route has been refined, several attempts (in conjunction with landowner consultation) have been made to minimise the amount of severed land. The total area of land that would be impacted during construction equates to approximately 288ha and breaks down as follows:

- Onshore cable route (207.95ha);
- Temporary construction compounds (29.76ha);
- Off route haul road (28.51ha); and
- Onshore landfall compound (14.29ha).

129. The total area of BMV within Essex is 299,028.39ha (Defra, 2017). The temporary land take of 288ha of BMV land therefore accounts for less than 0.1% of the regional agricultural resource.

130. As explained in Section 22.4.3, land take at the onshore substation including ancillary works and substation drainage is considered as a permanent loss of agricultural land which is discussed as a potential effect during operation in Section 22.6.3.

131. During construction it is unavoidable that land along the onshore cable route would temporarily be taken out of its existing land use, however, embedded mitigation measures will be implemented to reduce the potential impacts as far as practicable. These measures are set out in Table 22.3, and include:

- Full reinstatement of agricultural land immediately upon completion of the temporary works as far as reasonably practicable,
- All works to be undertaken under a SMP, set out within the CoCP (secured under a DCO requirement), which Contractors will be obliged to adhere to and which will set out the procedures for the appropriate handling of soils during the construction activities;
- Maintaining access to severed land for farm vehicles wherever practicable;
- Appointing an ALO to discuss and agree crossing points with landowners and occupiers pre-construction where necessary and feasible;
- Discussing the planning and timings of works with landowners and occupiers; and
- Habitat reinstatement.

22.6.1.2.1 Magnitude of impact

132. Taking into account the embedded mitigation and based on the worst case parameters set out in Table 22.2, the total construction footprint within agricultural land in Grades 1, 2 and 3a (i.e. BMV) would be >20ha with the potential for short term loss of land suitable for agriculture for <2 years. This is due to sequential construction of the cable route taking place in sections, minimising the amount of land being worked on at any one time. Therefore, the magnitude of impact is considered to be low.

22.6.1.2.2 Sensitivity of receptor

133. The quality of the land within the onshore project area varies from ALC grades 1 – 4 (including urban). As described in Section 22.5, as a worst case for the purpose of assessment it has been assumed that all ALC Grade 3 land is to be considered BMV, and therefore under this classification the majority of the land area that is subject to temporary land take is BMV (88.8% of the onshore project area). Therefore, the sensitivity of the receptor, in accordance with Table 22.6, is considered to be high.

22.6.1.2.3 Significance of effect

134. Given the low magnitude of impact and the high sensitivity of the receptor, the significance of effect of the temporary loss of agricultural land is **moderate adverse** which is significant in EIA terms.

22.6.1.2.4 Additional mitigation

135. No additional mitigation is proposed over and above that set out in Table 22.3 as embedded mitigation.

22.6.1.2.5 Residual significance of effect

136. Given no further mitigation is proposed, this represents a **moderate adverse** significance of effect which is significant in EIA terms.

22.6.1.3 Impact 3: Soil degradation

137. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works, including at temporary compound locations, along access routes and where heavy materials and equipment are stored. Similarly, changes to the local drainage may also cause soil structure to deteriorate (this is described in ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)). Deterioration of the soil structure can lead to reduced biological activity, water infiltration, soil porosity and permeability and increased soil strength and risk of erosion (European Commission, 2008). These impacts can lead to reduced fertility and crop yields, should the site be returned to agricultural use post construction.

138. Soil quality can also be adversely affected by spills and leaks of contaminative materials and the drying and decomposition of peaty layers during stockpiling.

139. The following activities proposed during the construction phase have the potential to degrade the existing soil resource:

- Intrusive pre-construction surveys;
- Removal of trees/vegetation;
- Topsoil stripping and earthworks within the construction footprint;
- Use of the haul road and temporary construction compounds; and
- Stockpiling and reinstatement of soil.

140. Impacts on the soil resource would be minimised through the embedded mitigation detailed in Table 22.3, which includes:

- Reducing the footprint of the works;
- Limiting the soil exposure time;
- Using a competent contractor for soil handling, storage and reinstatement; and
- Adopting a SMP (which will set out the procedures for the appropriate handling of soils during the works and reinstatement requirements).

22.6.1.3.1 Magnitude of impact

141. Soil within the onshore project area (approximately 288ha) would be subject to earthworks including initial stockpiling and movement between stockpiles during the construction period for both the cable route and landfall. Although the construction of the onshore cable route will take up to 27 months, it is unlikely that all 288ha of the agricultural soils along the onshore cable route will be impacted at the same time as construction will be completed in 400m intervals with exposure of soils to degradation for approximately 4 weeks. Alongside

adoption of the embedded mitigation measures set out in Table 22.3, and the sequential build out described above, agricultural land affected by soil degradation is expected to make a full recovery within 5 years (see Table 22.8). There will therefore be a low magnitude of impact on soils within the onshore project area during construction.

22.6.1.3.2 Sensitivity of receptor

142. The soils in the study area are in general loamy and clayey (as described in Section 22.5.2) and, therefore susceptible to compaction. They are also difficult to handle during wet periods using machinery without causing structural degradation. Therefore, the sensitivity of the receptor is considered to be medium.

22.6.1.3.3 Significance of effect

143. Given the low magnitude of impact and medium sensitivity of the receptor, the significance of effect for soil degradation during construction is **minor adverse** which is not significant in EIA terms.

22.6.1.4 Impact 4: Loss of soil to erosion

144. Soil can be susceptible to erosion, with some soil types more susceptible than others under certain weather conditions. Excavation, storage and reinstatement exposes the soils and creates an opportunity for potential erosion to occur.

145. Embedded mitigation as set out in Table 22.3 is proposed to reduce any effects from loss of soil resource by erosion. Adherence to the MAFF (2000) Good Practice Guide for Handling Soils and Defra (2009) Construction code of practice for the Sustainable Use of Soils on Construction Sites will be adopted and included in the CoCP and SMP.

146. The appointed contractor would be required to comply with the SMP, which will employ industry good practice techniques to protect the soil resource.

147. It is expected that these mitigation measures will reduce the loss of soil to erosion and hence the risk associated with loss of land for agriculture, which would impact upon its associated usability and value.

22.6.1.4.1 Magnitude of impact

148. The Project would require excavation during sequential construction for the onshore cable route and TCCs, off route haul road (273.86ha, for up to 27 months) and landfall compound (14.29ha, for up to 13 months).

149. Alongside adoption of the embedded mitigation measures set out in Table 22.3, and the linear build out described above, agricultural land affected by soil erosion is expected to make a full recovery within 5 years (see Table 22.8). There will therefore be a low magnitude of impact on soils within the onshore project area during construction.

22.6.1.4.2 Sensitivity of receptor

150. Given the construction footprint is dominated by loamy and clayey soils, which have a relatively cohesive nature, it is not considered that the soils would be highly vulnerable to erosion and the sensitivity of the soils to erosion is therefore considered to be low.

22.6.1.4.3 Significance of effect

151. Given the low level of magnitude, on a low sensitivity receptor, the significance of effect for loss of soil to erosion during construction is **negligible adverse** which is not significant in EIA terms.

22.6.2 Likely Significant effects during construction: Land use

22.6.2.1 Impact 5: Impact to agri-environment schemes

152. During the construction period there would be the potential for impacts on agri-environment schemes within the onshore project area. The effect on individual landowners/occupiers is likely to be specific to their own scheme, which would need to be discussed between the Applicant, landowners, occupiers and Natural England prior to construction. Depending on the agreement objectives and location of the construction works, the impacts could range from the agreement ceasing entirely to no impact on the agreement. As such, this assessment looks at the effects in general terms rather than on an agreement-by-agreement basis.

153. As a result of construction, two potential connected impacts on agri-environment schemes are anticipated:

- Ecological – loss of the agreements and the substantive agri-environmental objectives of the scheme (i.e. loss of field margins); and
- Financial – loss of the agreements and the impact on overall farm business income.

154. Ecological features that are likely to be subject to agreements, such as wetland scrapes, have been avoided in selection of all elements of the onshore project area (where practicable). A number of sensitive features such as Ordinary Watercourses and hedgerows will be crossed using trenchless techniques (e.g. HDD) (this is considered further in ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.25)). Where rivers, ditches and hedgerows would be crossed; these would be crossed in a perpendicular manner where practicable to minimise disturbance to those features and will be replanted/reinstated following completion of the works.

155. Following the completion of construction, all areas subject to agri-environmental agreements would be reinstated to their pre-construction condition where practicable.

156. The landfall for North Falls interacts with two ESS classified at Entry Level plus Higher Level Stewardship, covering an area of 43.76 ha, which represents 11.38% of the onshore project area (see ES Figure 22.3 (Document Reference: 3.2.18)). Landfall also interacts with one Higher Tier CS, covering an area of 0.8ha, which represents 0.21% of the onshore project area (see ES Figure 22.3 (Document Reference: 3.2.18)).

157. The onshore cable route crosses ten CS ranging from Capital Grants to Higher Tier CS (Table 22.15), covering an area of 152.61 ha, which represents 39.69% of the onshore project area (see ES Figure 22.3 (Document Reference: 3.2.18)).

158. There is potential for a certain amount of disruption to agri-environment schemes as a direct result of loss of land during the construction affecting

features such as field margins. The total land within an ESS or CS agreement crossed by the onshore project area is 196.37ha (51.07% of the onshore project area).

159. In some instances, it may not be possible to avoid land managed under an agri-environment scheme, resulting in a landowner / occupier being unable to meet the terms of an agreement. The magnitude of impact could range from the termination of an agreement to no impact, or a minor and temporary change such as the need to make changes to grazing or cropping requirements. For the purposes of DCO submission, the impact on specific agreements will only be known once the final onshore project area has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.

160. The significance of effect on landowners / occupiers with agri-environment schemes in place will depend on the extent and duration of construction works within land parcels managed under an ESS or CS, and the terms and conditions attached to the agreement in place.

161. Embedded mitigation has included refinement of the onshore project area (most notably the onshore cable route) which has taken into consideration land parcels managed under agri-environment schemes, avoiding these land parcels where practicable. Landowner engagement has formed a key part of the onshore cable route refinement, during which information relating to the location, extent and content of agri-environment schemes has been gathered and fed back into the refinement process for North Falls. This included gathering information from landowners on any ecological constraints or opportunities associated with existing agri-environmental schemes.

162. The embedded mitigation relating to agri-environment schemes includes the avoidance of land parcels that are subject to ESS or CS during detailed design, wherever practicable (for example avoiding a headland area created under such a scheme by targeting the field adjacent to it).

163. Where avoidance is not possible, appropriate planning and timing of works will be agreed with landowners and occupiers, subject to individual agreements, to reduce conflicts.

164. Following completion of the construction works, land will be reinstated to its original condition, as set out within the SMP which the Principal Contractor would need to comply with and would therefore be available for management under an agri-environment agreement in the future.

165. The embedded mitigation mentioned above will reduce the temporary risk to agri-environment schemes, resulting in a minimal effect on usability, risk or value in the medium to long term.

22.6.2.1.1 Magnitude of impact

166. Although the construction of the onshore cable route is expected to take up to 27 months, it is unlikely that all 35% of the onshore cable route will be impacted at the same time due to the sequential construction of linear projects. The construction earthworks could potentially lead to some temporary loss affecting the usability of agri-environment land across the construction areas in the short term (<5 years), representing a low magnitude of impact.

167. It is considered that ecological losses associated with impacts to agri-environment schemes would be mitigated through the mitigation set out in ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25), therefore minimising effects upon the environmental features which the agri-environment schemes identified within the onshore project area support.

168. As such, the construction earthworks could potentially lead to some temporary loss however this would not affect the value of agri-environment land across the construction areas, representing a negligible magnitude of impact.

22.6.2.1.2 Sensitivity of receptor

169. Landfall interacts with two ESS classified at Entry Level plus Higher Level Stewardships and one Higher Tier CS. The onshore cable route crosses ten CS ranging from Capital Grants to Higher Tier CS. As such, the sensitivity of the receptor is considered to be high.

22.6.2.1.3 Significance of effect

170. Given the negligible magnitude of impact on a high sensitivity receptor, the likely significance of effect on agri-environment schemes during construction is **minor adverse** which is not significant in EIA terms. The Applicant acknowledges that impacts would occur at an individual level and therefore every effort will be made to engage with those landowners potentially affected.

22.6.2.2 Impact 6: Disruption to existing utilities

171. The majority of the identified utilities crossing the onshore project area are for domestic services that include telecommunications, electricity, water, gas, sewage, unspecified pipeline and street lighting. The onshore project area will also cross a buried major Affinity Water main south of the A120.The crossing techniques proposed at each crossing is presented within ES Appendix 5.1 Crossing Schedule (Document Reference: 3.3.2).

172. The onshore project area passes close to the existing Gunfleet Sands OWF underground transmission cable at landfall (near Holland-on-Sea) (ES Figure 22.6 (Document Reference: 3.2.18)).

173. Protective provisions and/or side agreements will be agreed with affected utilities as part of the DCO application process. NFOW will undertake utility crossings or diversions in accordance with the appropriate industry standards for such crossings.

174. The continuity of public water supplies during construction works would be ensured. The onshore cable route has been selected to avoid major utilities where practicable. Potential impacts to private water supplies are considered in ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23).

22.6.2.2.1 Significance of effect

175. Through protective provisions secured via the DCO and agreements with utility undertakers, the risks to utilities will be avoided. Therefore, it is considered that there would be **no impact** upon utilities during construction, which is not significant in EIA terms.

22.6.3 Likely significant effects during operation: Agriculture

176. This section describes the potential impacts arising during the operational phase of the Project. Reference should also be made to ES Chapter 5 Project Description (Document Reference: 3.1.7) for further details of the operational phase.

22.6.3.1 Impact 7: Agricultural drainage

177. The Project will primarily be located on rural, agricultural land where there are limited existing formal surface water drainage systems. However, there are a large number of agricultural land drains and Ordinary Watercourses.

178. Permanent above ground infrastructure and hard standing at the onshore substation, as well as the presence of buried cables has the potential to affect the field / land drainage during operation (see ES Chapter 21 Water Resource and Flood Risk (Document Reference: 3.1.23) for further detail).

179. Although the onshore substation footprint and associated ancillary works and TCC covers an area >20ha, the usability of agricultural drainage is not expected to cover the full area as drainage will typically be located along hedgerow boundaries and natural field drains such as ditches etc. Nevertheless, taking the worst case, it is anticipated that agricultural drainage within an area >20ha of Grade 1,2 or 3 agricultural land will be unsuitable for agriculture in the medium to long term (2-10 years) during the construction phase of the onshore substation and TCC. Despite taking into account the embedded mitigation, as set out in Table 22.3, the magnitude of the impact for the onshore substation and TCCs would be medium.

180. During operation, in the unlikely event of transformer failure, an AIL access route to the onshore substation would need to be re-established in order to bring a replacement transformer to the onshore substation. Should this be required, the onshore substation construction access haul, running from Bentley Road to Ardleigh Road would be reinstated in its entirety for the delivery of the transformer, including reinstatement of the construction access and TCC west of Bentley Road. It would then be removed again once the transformer has been delivered. This activity would take up to seven months in total. Likely effects associated with this activity are deemed to be no greater than those assessed during the construction phase assessment.

181. As stated in Table 22.3, the Applicant will appoint a land drainage consultant to develop pre-and post-construction drainage plans. Post-construction, land drainage along the onshore cable route would be reinstated to the condition that was in place pre-construction. All cable construction compounds and temporary haul roads will be fully reinstated to their original land use.

182. The backfilling of subsoil and then topsoil in the cable trenches will prevent a conduit from forming and ensure there are no changes to the local flow rates due to permeability changes.

183. Whilst there will be a permanent change to the field drainage at the onshore substation site during operation, this will be compliant with the Flood Risk Assessment (FRA) as presented in ES Appendix 21.3 (Document Reference: 3.3.29) and will ensure that any water discharged from the substation into the surrounding drainage network would be at the existing greenfield runoff rate.

22.6.3.1.1 Significance of effect

184. Given that land drainage would be reinstated and drainage requirements at the onshore substation would be compliant with any FRA, it is considered that there would be **no impact** upon agricultural drainage during operation, which is not significant in EIA terms.

22.6.3.2 Impact 8: Permanent loss of agricultural land

185. The onshore export cables will be buried to a depth of at least 0.9m and following reinstatement, normal agricultural activities will be able to continue during operation of the Project.

186. Up to 192 joint bays would be required along the route of the onshore export cables to connect sections of cable, with a footprint of 4 x 15m per bay. Routine maintenance is anticipated as consisting of occasional visits to jointing bays to carry out routine integrity tests, which would typically be accessed via man-hole covers. TJBs are underground structures, therefore will not impact agricultural land during operation.

187. Up to 96 link boxes will also be present, these will be underground along the cable route with a manhole cover in a concrete plinth above ground (0.6 x 1 x 1.5m).

188. The footprint of the onshore substation works area and the Bentley Road improvement works would represent the permanent land take for the duration of the operational phase.

22.6.3.2.1 Magnitude of impact

189. Following Natural England's (2012) guidance, any landscaping, environmental mitigation or even drainage works have been excluded from the calculations for the permanent loss of agricultural land as the soil resource is preserved and enhanced.

190. As such, the total permanent land take for the footprint of North Falls comprises:

- Onshore substation footprint (5.9ha);
- Onshore substation access route (0.45ha); and
- Link boxes (0.0092ha).

191. Therefore the total permanent land take would be 6.36ha across the Project. The permanent land take of 6.36ha of BMV land accounts for 0.002% of the available regional resource.

192. Due to the permanent loss of <10ha of any agricultural land for the operational infrastructure and the additional landscaping footprint which may have the potential to mitigate the loss in soil functions, the impact to agricultural productivity in considered to be of medium magnitude.

193. It is worth noting that the magnitude of impact has increased from low (as assessed at PEIR) to medium (as assessed within this chapter) due to the inclusion of the onshore substation ancillary works and onshore substation access route within the onshore substation footprint considered as permanent land take for the Project.

22.6.3.2.2 Sensitivity of receptor

194. The onshore substation is proposed on land classified as ALC Grade 1, which represents a high sensitivity receptor.

195. The Bentley Road improvement works are proposed on land classified as ALC Grade 2, which also represents a high sensitivity receptor.

22.6.3.2.3 Significance of effect

196. Given the magnitude of impact is considered to be medium, on a high sensitivity receptor, the significance of effect of permanent agricultural land loss is predicted to be **major adverse**, which is significant in EIA terms.

22.6.3.2.4 Additional mitigation

197. No additional mitigation is proposed over and above that set out for the construction impacts.

22.6.3.2.5 Residual significance of effect

198. Taking this into account, the residual significance of effect on the permanent loss of agricultural land during operation is major adverse, which is significant in EIA terms.

22.6.3.3 Impact 9: Soil heating

199. The transmission of electricity results in small energy losses in the form of heat dissipation. However, the design of the onshore cable system would seek to minimise any energy losses. Depending on the thermal resistivity of the soil and the height of the water table, it is considered that a stabilised backfill such as CBS would be required to encase the cable ducts. This is commonly used to ensure that the thermal conductivity of the material around the cables is of a known consistent value for the length of the installation. CBS has a low thermal resistance to conduct the heat produced during electricity transmission.

22.6.3.3.1 Significance of effect

200. Any effect on soil heating would be highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables would be buried at a minimum depth of 0.9m, with the principal root growth zone generally accepted to be within the first 50mm of the soil from the surface. In addition, the use of CBS will remove any material heat transfer from the cables to the surrounding environment.

201. **No impact** on soil heating is anticipated during operation of the Project, which is not significant in EIA terms.

22.6.4 Likely significant effects during operation: Land use

22.6.4.1 Impact 10: Agri-environment schemes

202. Following the construction phase, land associated with landfall and the onshore cable route that is located within agri-environment schemes will be reinstated to its original condition.

203. The onshore substation works area and Bentley Road improvement works represent the permanent infrastructure where land would not be reinstated during operation and therefore has the potential to affect land designated under agri-environment schemes.

204. The onshore substation and Bentley Road improvement works do not cross any agri-environment schemes. There is one Mid-Tier CS located within the onshore project area (within the national grid substation footprint), however as the CS is more than 600m northwest of the proposed footprint for the North Falls onshore substation, the Project will have no impact on the agri-environment scheme. As discussed in Section 22.4.3, O&M accesses are not considered further as part of the permanent land take during operation because the Applicant does not intend to alter the area of these private road accesses, therefore no additional agricultural land has been taken out of use.

22.6.4.1.1 Significance of effect

205. Given the Project is not aware of any agri-environmental schemes affected by permanent onshore infrastructure, there is considered to be **no impact** during the operation of the Project, which is not significant in EIA terms.

22.6.4.2 Impact 11: Utilities

206. The potential exists for maintenance activities to affect utilities, since these activities may require access to the buried cables. Utilities are considered to be highly sensitive, in particular electricity, gas and water mains, due to the potential disruption that could be caused should the services be disrupted. The majority of the identified utilities crossing the onshore project area are for domestic services that include telecommunications, electricity, water, gas, sewage and street lighting.

207. The onshore project area passes close to the existing Gunfleet Sands OWF underground transmission cable at landfall (near Holland-on-Sea) (as shown on ES Figure 22.6 (Document Reference: 3.2.18)).

208. Any utilities maintenance would involve contacting utility providers and identifying the location of existing services prior to maintenance works to ensure no impact to these utilities. Maintenance activities will be undertaken in accordance with protective provisions as set out in the DCO and/or side agreements.

22.6.4.2.1 Significance of effect

209. Given maintenance activities will be undertaken in accordance with protective provisions as set out in the DCO and/or side agreements, it is anticipated that there will be **no impact** to utilities during operation of the Project, which is not significant in EIA terms.

22.6.5 Likely significant effects during decommissioning

210. This section describes the potential impacts of the decommissioning of the onshore infrastructure with regards to impacts on land use and agriculture. Further details are provided in ES Chapter 5 Project Description (Document Reference: 3.1.7).

211. It is generally accepted that industry good practice, rules and legislation change and develop over time. As a result, no decision has been made regarding the final decommissioning policy for the onshore export cables. However, the most likely scenario is that the cables would be pulled through the ducts and removed, with the ducts themselves sealed and capped and left in-situ.

212. In relation to the onshore substation, the programme for decommissioning is expected to be similar in duration to the construction phase. The detailed activities and methodology would be determined later within the Project lifetime.

213. Whilst details regarding the decommissioning of the onshore substation are currently unknown, considering the worst case scenario which would be the removal and reinstatement of the current land use at the site, it is anticipated that the impacts would be similar or less than to those during construction.

214. The decommissioning methodology would be finalised closer to the end of the lifetime of the Project, so as to be in line with current guidance, policy and legislation at that point. Any such methodology and associated mitigation would be agreed with the relevant authorities and statutory consultees. The decommissioning works could be subject to a separate licensing and consenting approach.

22.7 Potential monitoring requirements

215. It is considered at this stage that no operational monitoring is required for land use and agriculture.

22.8 Cumulative effects

22.8.1 Identification of potential cumulative effects

216. The first step in the CEA process is the identification of which residual effects assessed for North Falls on their own have the potential for a cumulative effect with other plans, projects and activities. This information is set out in Table 22.18. Only likely significant effects assessed in Section 22.6 as negligible or above are included in the CEA (i.e. those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative effect).

Table 22.18 Potential cumulative effects

Impact	Potential for cumulative effect	Rationale
Construction		
Impacts on agricultural drainage	Yes	Cumulative direct impacts arising from two or more projects are possible given the level of uncertainty regarding the presence and location of drainage systems. Impacts may occur to individual field drains in any area of overlap or those with an extent which intersects two or more proposed development boundaries (where groundworks are anticipated).
Temporary loss of agricultural land	Yes	Cumulative direct impacts arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect local productivity (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Soil degradation	Yes	Cumulative direct impacts arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land.

Impact	Potential for cumulative effect	Rationale
		Such impacts have the potential to affect local productivity (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Soil erosion	Yes	Cumulative direct impacts arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect local productivity (e.g. loss of earnings from more than one project taking the same parcels of land out of use).
Impacts on agri-environment schemes	Yes	Cumulative direct effects arising from two or more projects are possible. Impacts may occur where project boundaries overlap spatially or temporally on the same landowner/occupier's land. Such impacts have the potential to affect land under agri-environment schemes (e.g. loss of earnings from agri-environment schemes from more than one project taking the same parcels of land out of use).
Impacts on utilities	No	Potentially affected utility providers would be contacted, and the location of existing services would be identified prior to works to ensure there would be no likely significant effect.
Operation		
Impacts on agricultural drainage	No	Due to the reinstatement of drainage post construction and adherence with the FRA, no cumulative effects are predicted during operation.
Permanent loss of land for agriculture	Yes	Cumulative effects may occur at a county scale where impacts to productivity affect the wider agriculture industry.
Impacts on agri-environment schemes	No	Due to no agri-environment schemes being affected by North Falls, no cumulative effects can occur during operation.
Impacts on utilities	No	Potentially affected utility providers would be contacted and the location of existing services would be identified prior to works to ensure there would be no likely significant effect.
Decommissioning		
Decommissioning strategies have not yet been finalised; however, the cumulative effects are expected to be the same as those of initial construction.		

22.8.2 Other plans, projects and activities

217. The second step in the cumulative assessment is the identification of the other plans, projects and activities that may result in cumulative effects for inclusion in the CEA (described as 'project screening'). This information is set out in Table 22.19 below, together with a consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to North Falls, status of available data and rationale for including or excluding from the assessment.

218. The project screening has been informed by the development of a CEA project list which forms an exhaustive list of plans, projects and activities within the study area (Section 22.3.1) relevant to North Falls. The list has been appraised, based on the confidence in being able to undertake an assessment from the

information and data available, enabling individual plans, projects and activities to be screened in or out.

219. As set out in ES Chapter 6 EIA Methodology (Document Reference 3.1.8), projects in Tendering District Council and Essex County Council have been considered as a part of the cumulative assessment. Only projects that overlap the onshore project area for land use and agriculture have been included in the CEA, as it is considered unlikely that projects at distances greater than this will result in cumulative effects between projects.

220. It is considered that geographic separation between projects results in the absence of cumulative effects to land use and agriculture. Based on geographic separation between North Falls and other proposed, or consented developments within Tendering District Council and Essex County Council, the majority of other projects have been scoped out of the cumulative assessment on this basis.

Table 22.19 Summary of projects considered for the CEA in relation to land use and agriculture (project screening)

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
National Infrastructure Planning						
Five Estuaries Offshore Wind Farm EN010115	Pre-application	2027 - 2030	Five Estuaries onshore project area directly overlaps with North Falls onshore project area.	High	Yes	There is a spatial overlap between the onshore project area for North Falls and Five Estuaries. There is also the potential for there to be a temporal overlap during construction and operational phases of both Five Estuaries and North Falls. Therefore, cumulative effects may occur.
Norwich to Tilbury EN020027	Pre-application	2027 - 2031	Scoping area directly overlaps with North Falls onshore project area.	Low	Yes	The proposed Norwich to Tilbury project seeks to reinforce the high voltage power network in East Anglia between existing substations (Norwich Main, Bramford in Suffolk and Tilbury in Essex) as well as connect the Five Estuaries and North Fall Offshore Wind Farm developments to the network. There is a spatial overlap between the proposed location of the Norwich to Tilbury substation and the North Falls substation compound, the cables which will connect North Falls into the Norwich to Tilbury substation and any additional works required to facilitate the connection, therefore there is the potential for cumulative effects to occur.
East Anglia TWO Offshore Windfarm EN010078	Approved (DCO Issued 2022)	Mid 2020s	47	High	No	The onshore infrastructure for this project is not in close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture.
Bradwell B new nuclear power station EN010111	Pre-application	Predicted 9 – 12 years	21	High	No	The project is not in close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Ipswich Rail Chord TR040002	Approved (DCO issued 2012)	Built	17	High	No	Ipswich Rail Chord has already concluded construction and will therefore not contribute to cumulative effects during North Falls construction, operation, or decommissioning periods.
Sizewell C Project EN010012	Approved (DCO issued 2022)	2022 – 2034	49	High	No	Sizewell C Project is located over 40km from the onshore project area and so will not likely have a cumulative effect on land use and agriculture at the local scale.
Nautilus Interconnector EN020023	Pre-application	Information unavailable	44	Medium	No	The location of onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture at the local scale.
Lake Lothing Third Crossing TR010023	Approved (DCO issued 2020)	Over 2 years	76	High	No	The project is over 75km away from the onshore project area so will not likely have a cumulative effect on land use and agriculture at the local scale.
Richborough Connection Project EN020017	Approved (DCO issued 2017)	Built	55	High	No	This project has already been built and is therefore now part of the existing baseline.
Kentish Flats Extension EN010036	Approved (DCO issued 2013)	Built	46	High	No	This project has already been built and is therefore now part of the existing baseline.
Sea Link EN020026	Pre-application	Information unavailable	20	N/A	No	The location of any onshore infrastructure associated with this project is not known, however, it is highly unlikely to be within close proximity to the onshore project area so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Galloper Offshore Windfarm EN010003	Approved	Built	15	High	No	This project has already been built and any onshore infrastructure is now part of the baseline.
A12 Chelmsford to A120 widening scheme TR010060	Pre-examination	Information unavailable	27	Medium	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Rivenhall IWMF and Energy Centre EN010138	Pre-application	Information unavailable	27	Medium	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Essex County Council						
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
St. George's Infant School and Nursery, Barrington Road, Colchester, Essex, CO2 7RW CC/COL/71/22	Approved	Information unavailable	9	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Wilson Marriage Centre, Barrack Street, Colchester, Essex, CO1 2LR CC/COL/85/22	Approved	Information unavailable	9	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Wivenhoe Quarry Alresford Road, Wivenhoe, Essex, CO7 9JU ESS/80/20/TEN/42/2	Report being prepared	Information unavailable	7	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT ESS/24/15/TEN/55/1/NMA	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Elmstead Hall, Elmstead, Colchester, Essex, CO7 7AT ESS/24/15/TEN/55/1/NMA	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Old Heath County Primary School, Old Heath Road, Colchester, Essex, CO2 8DD CC/COL/50/22	Approved	Information unavailable.	8	N/A	No	The project is outside of the onshore project area for the project so will not likely have a cumulative effect on land use and agriculture, especially when considering the works' localised nature.
Crown Quarry (Wick Farm), Old Ipswich Road, Ardleigh, CO7 7QR ESS/57/04/TENLA4	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Wivenhoe Quarry, Alresford Road Wivenhoe, Essex CO7 9JU ESS/80/20/TEN/42/2	Approved	Information unavailable.	7	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Martell's Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/42/22/TEN	Out for consultation	Information unavailable	3	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land at: Elmstead Hall, Elmstead, Colchester, Essex ESS/105/21/TEN	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Land at Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/39/22/TEN	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land to the south of Colchester Main Road, Alresford, Colchester, CO7 8DB ESS/17/18/TEN/NMA2	Report being prepared	Information unavailable	6	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land at: Martells Quarry, Slough Lane, Ardleigh, Essex, CO7 7RU ESS/39/22/TEN/NMA/1	Approved	Information unavailable	3	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE CC/TEN/40/21/3/1	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
Tendring Education Centre, Jaywick Lane, Clacton on Sea, Essex, CO16 8BE CC/TEN/40/21/4/1	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land At Martells's Quarry, Slough Lane, Ardleigh, Essex CO7 7RU ESS/39/22/TEN	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land At Martells's Quarry, Slough Lane, Ardleigh, Essex CO7 7RU ESS/39/22/TEN/NMA/1	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Crown Quarry (Ardleigh Reservoir Extension), Wick Farm, Old Ipswich Road, Tendring, Colchester, CO7 7QR ESS/57/04/TENLA4	Approved	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
Ardleigh Waste Transfer Station, A120, Ardleigh, Colchester, CO7 7SL ESS/04/17/TEN	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for the Project, so will not likely have a cumulative effect on land use and agriculture at the local scale.
35 Roach Vale, Colchester, CO4 3YN CC/COL/07/22	Approved	Information unavailable.	4	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Boxted Bridge, Boxted, Essex, CO4 5TB CC/COL/106/21	Report being prepared	Information unavailable	9	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Elmstead Hall, Elmstead, Colchester, Essex ESS/24/15/TEN	Approved	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for the Project so will not likely have a cumulative effect on land use and agriculture at the local scale.
Lufkins Farm, Great Bentley Road, Frating CO7 7HN ESS/99/21/TEN/SO	EIA not required	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
Lufkins Farm, Great Bentley Road, Frating CO7 7HN ESS/99/21/TEN	Resolution made/ awaiting legal agreement	Information unavailable.	6	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Elmstead Hall, Elmstead, Colchester ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Elmstead Hall, Elmstead, Colchester, CO7 7EX ESS/24/15/TEN	Approved	Information unavailable.	5	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Tendring District Council						
Land Between the A120 and A133, To The East of Colchester and of Elmstead Market 21/01502/CMTR	Awaiting decision	Information unavailable.	3	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Hamilton Lodge Parsons Hill Great Bromley Colchester Essex CO7 7JB 20/00547/OUT	Approval-outline	Information unavailable.	2	N/A	No	The project is outside of the onshore project area for North Falls so will not likely have a cumulative effect on land use and agriculture at the local scale.
Land adjacent to Lawford Grid Substation Ardleigh Road Little Bromley Essex CO11 2QB 21/02070/FUL	Approved	Information unavailable.	0.3	Low	No	The project involves the construction and operation of a 50MW Battery Energy Storage System (BESS), and related infrastructure with associated access, landscaping and drainage. The proposed location of the BESS is adjacent to North Falls onshore substation works area.

Project	Status	Construction period	Closest distance from the onshore project area (km)	Confidence in data	Included in the CEA (Y/N)	Rationale
						However, due to the nature of the development and the assumption that appropriate mitigation measures will be implemented to protect the surrounding environment, it is considered that there is no potential for cumulative effects to occur. It is also anticipated that, as the application has been approved, construction would be completed prior to the start of the construction works for North Falls. Therefore, no cumulative effects on shared receptors are anticipated.

22.8.3 Assessment of cumulative effects

221. Five Estuaries is also in its application phase, having submitted a DCO to the Planning Inspectorate for the project, which was accepted on 22nd April 2024. Although subject to a separate DCO, Five Estuaries shares the same landfall location and onshore cable route (including Bentley Road improvement works) as North Falls, with the two projects also having co-located onshore substations within the same onshore substation works area. The two projects also have the same national grid connection point.

222. Five Estuaries Offshore Wind Farm Limited and NFOW have sought to collaborate and coordinate where practicable, which has led to collaborative design of the projects' onshore infrastructure, and also to sharing of detailed project design information onshore. As a result, a detailed CEA for effects arising from the development of Five Estuaries can be undertaken. The CEA section of this chapter is therefore split into two sections:

- The first describing a detailed CEA covering effects predicted to arise from development of Five Estuaries and North Falls;
- The second, detailing effects predicted to arise from the development of Five Estuaries, North Falls and other projects.

223. The latter section will be based on the project information available for each scheme in the public domain, and by definition is therefore less detailed than Five Estuaries and North Falls CEA section. A summary, which details overall cumulative effects arising from the development of North Falls, Five Estuaries and other projects, is then provided in Section 22.8.3.2.

224. Full details on the approach to CEA used within this chapter are set out in ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

22.8.3.1 Five Estuaries Offshore Wind Farm

22.8.3.1.1 Realistic worst case scenario

225. Using the design information provided by VEOWL (and checked/updated against the submission of the Five Estuaries ES), a realistic worst case cumulative scenario has been developed for the purpose of this chapter.

226. This realistic worst case cumulative scenario considers three potential cumulative scenarios, as outlined in ES Chapter 5 Project Description (Document Reference: 3.1.7):

- **Scenario 1:** North Falls 'Option 2' build out is progressed, and Five Estuaries undertakes landfall, onshore substation construction and cable pull which overlaps with North Falls equivalent works. In this scenario, onshore cable route associated works, including temporary construction compounds, accesses and haul road, all remain in place and are used by the second project during its construction.
- **Scenario 2:** North Falls 'Option 1 build out is progressed, and Five Estuaries undertakes landfall, onshore substation and onshore cable route construction and cable pull, all of which does not overlap with North Falls' equivalent works. There would be a gap of between 1 and 3 years between each Projects' construction. In this scenario, onshore cable route associated works, including temporary construction compounds, accesses and haul

road, all remain in place and are used by the second project during its construction.

- **Scenario 3:** North Falls 'Option 1' build out is progressed, and Five Estuaries undertakes a separate landfall, onshore substation and onshore cable route construction and cable pull with a multi-year (i.e. >3 year) gap between the two construction activities. In this scenario, there is no reuse in onshore temporary works between the two projects, and all onshore cable route associated works are rebuilt and reinstated in full by the second project.

227. Full details on the build out scenarios considered within this assessment are detailed in ES Chapter 5 Project Description (Document Reference: 3.1.7) and ES Chapter 6 EIA Methodology (Document Reference: 3.1.8).

228. For land use and agriculture, Scenario 3 is considered the worst case cumulative scenario, as it involves no reuse of temporary works and involves the maximum potential duration that land is taken out of use for temporary works. The realistic worst case scenario parameters for likely cumulative effects scoped into the EIA for the land use and agriculture assessment under Scenario 3 are summarised in Table 22.20. These are based on project parameters for North Falls and Five Estuaries.

Table 22.20 Realistic worst-case scenario of cumulative effects arising from development of North Falls and Five Estuaries – (Scenario 3) (independent build).

Element of the Project infrastructure	Parameter	Notes
Construction		
Landfall	Landfall HDD (temporary works) physical parameters: • Maximum No. of TJB = 4 • Individual TJB dimensions / permanent land take = 4 x 15m • Maximum indicative HDD spacing onshore = 40m • Maximum HDD depth = 20m • Maximum indicative length of HDD = 1.1 km • HDD temporary works area = 150 x 300m • Drill exit location = subtidal exit below MHWS (up to 8m depth)	Duration includes compound establishment, HDD, transition bays, and reinstatement.
	Duration: • 13 months (of which HDD = 6 months) + 13 months (of which HDD = 6 months) • HDD to include 24 hour / 7 days working where required	
Onshore cable route	Cable route construction physical parameters: • Route length = up to 24km • Jointing bays = Up to 192 (approximately every 500m) buried below ground • Joint bay dimensions = 4 x 15m • Maximum cable trench depth = 2m • Minimum cable burial depth = 0.9m • Indicative cable route width = 72m (open cut trenching), 90m (trenchless crossings), 65m + 130m (complex trenchless crossings) • Cable construction compound dimensions = 150 x 150m (main) to 100 x 100m (satellite) • No. of trenches = 4 • Cable trench dimensions = 3.5 – 1.2 x 2m (tapered top to bottom)	Overall duration includes establishing / reinstating TCCs and haul roads, cable installation (trench excavation, duct installation, cable jointing), HDD (includes compound establishment, HDD, and reinstatement).

Element of the Project infrastructure	Parameter	Notes
	• Haul road width = 6m wide road, 10m wide total including verges, drainage and passing places.	
	Trenchless crossings physical parameters: • Maximum width of buried cable = 130m • Maximum trenchless crossing depth = 20m • HDD compound dimensions = 75 x 150m	
	Durations: • Bentley road improvement = 6 - 9 months • Cable route works = 18 – 27 months (per project, with a gap of up to 57 months in between projects) • Cable installation = 12 months (per project, with a gap of up to 57 months in between projects) • Major HDD (each location) = 8 months (of which HDD = 4 months) (per project) • Minor HDD crossings = 2 months (per project) • Major HDD crossings to include 24 hour / 7 days working where required.	
Onshore substation and national grid substation connection works	Onshore substation (temporary works) physical parameters: • Indicative area of the substations = 280 x 210m (project 1) + 280 x 210m (project 2) • Construction compound footprint = 250 x 150m (project 1) + 250 x 150m (project 2) National grid substation connection works physical parameters (for two projects): • All enabling work / platform constructed by national grid. • Cable installation works as described above • Equipment may include: ○ Cable sealing ends, surge arrestors, earth switch, disconnectors, circuit	

Element of the Project infrastructure	Parameter	Notes
	breakers, current transformers, voltage transformers, busbars	
	Durations: Substation construction duration = 21 - 27 months (per project, i.e. up to 54 months)	
Operation		
Onshore cable route	Cable corridors operational physical parameters: • No. of link boxes = up to 192 • Link box footprint (per box) = 0.6 x 1 x 1.5m • Cross-sectional area of buried cement-bound sand = 0.6m^2	
Onshore substation	Onshore substation physical parameters: • Permanent footprint (Project 1) = 280 x 210m • Permanent footprint (Project 2) = 280 x 210m	Normal operating conditions would not require lighting at the onshore substation, although low level movement detecting security lighting may be utilised for health and safety purposes. Temporary lighting during working hours would be provided during maintenance activities only. Low level continuous noise emissions would also be generated by the onshore substation during operation.
Decommissioning		
No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable route, 400kV cable route and onshore substation. It is also recognised that legislation and industry good practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused, or recycled where practicable and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator. It is anticipated that for the purposes of a worst case scenario, the impacts will be no greater than those identified for the construction phase.		

22.8.3.1.2 During construction: Agriculture

229. Under construction Scenario 3, whereby the Projects will be built out independently, which means that North Falls construction will commence once the Five Estuaries project has completed construction. As such, the construction period of both projects is anticipated to take up to 54 months as each project requires 21-27 months for construction.

230. This is a worst case scenario and highly unlikely, therefore the construction programme is very unlikely to be as long as a 54 month duration.

Impact 1: Agricultural drainage

231. There is the potential for the earthworks associated with the construction of the landfall and onshore cable routes for North Falls and Five Estuaries to impact the natural and artificial field drainage systems within the onshore project area. As such there is a pathway for cumulative effects with Five Estuaries.

232. Under construction Scenario 3, North Falls and Five Estuaries would overlap spatially at the landfall and along the onshore cable route which means there is the potential for the same agricultural drains to be affected twice (once for each separate construction activity), leading to direct and indirect physical cumulative effects on agricultural drainage. Embedded mitigation includes pre-and post-construction land drainage plans, as well as a commitment to maintain land drainage systems during construction and reinstate land drainage where impacts cannot be avoided following construction. However, under this scenario it is anticipated that the overall duration of construction would be extended resulting in longer whereby agricultural land drainage is disturbed. Implementation of these embedded mitigation measures for both projects' construction phases would not change the magnitude levels as assessed for the North Falls alone assessment in Section 22.6. Therefore, no likely significant direct or indirect physical cumulative effects during construction are predicted over and above the effects of North Falls (minor adverse).

233. With these measures in place, direct and indirect physical cumulative effects during construction are anticipated to not be significant in EIA terms.

Impact 2: Temporary loss of agricultural land

234. Construction activities within the onshore project area have the potential to either directly take land out of existing use or isolate land which would effectively take it out of use. For independent build out of North Falls and Five Estuaries, this would result in loss of at least four growing seasons (potentially more if there is a gap between the first project finishing and second project starting construction) in the land directly taken out of production and the loss of associated productivity.

235. Both projects will adopt an embedded mitigation strategy which will include the planning and timings of works being discussed with landowners and private agreements to be secured with the relevant landowners and occupiers. Wherever practicable, access to severed land for farm vehicles and agricultural machinery will be maintained. Where necessary and feasible, crossing points would be discussed and agreed with landowners and occupiers by the ALO pre-construction. This would ensure that the land taken out of use across the two projects would not occur simultaneously, ensuring that the amount of land taken

out of use for would still be <2 years in any one area. Therefore, no likely significant direct or indirect physical cumulative effects during construction are predicted over and above the effects concluded for North Falls (moderate adverse).

236. With these measures in place, direct and indirect physical cumulative effects during construction are anticipated to not be significant in EIA terms.

Impact 3: Soil degradation

237. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works, including temporary construction compound locations, particularly along access routes and where heavy materials and equipment are stored. Changes to the local drainage may also cause soil structure to deteriorate. Deterioration of the soil structure can lead to reduced biological activity, water infiltration, soil porosity and permeability and increased soil strength and risk of erosion (European Commission, 2008). These impacts can lead to reduced fertility and crop yields, should the site be returned to agricultural use post construction.

238. Soil quality can also be adversely affected by spills and leaks of contaminative materials and the drying and decomposition of peaty layers during stockpiling. Construction activities, as outlined in Section 22.6.1.3, have the potential to degrade the existing soil resource.

239. The overlapping footprint of both project areas means that there is the potential for direct and indirect physical cumulative effects on the existing soil resource whereby the same soils are disturbed on two occasions potentially separated by a gap in construction. Notably, the onshore landfall will require four TJBs (requiring a 4 x 15m temporary land take per TJB) for North Falls and Five Estuaries (as opposed to two TJBs for North Falls alone as assessed in the main assessment). However this still impacts <20ha of soil temporarily unsuitable for agriculture, therefore the magnitude remains low.

240. Both projects will adopt an embedded mitigation strategy, which will include reducing the footprint of the works due to refinements in project design (as noted between PEIR and this ES chapter), limiting the exposure time of soils and the adoption of a SMP secured within the CoCP (which will set out the procedures for the appropriate handling of soils during the works). Any cumulative change to soils during construction will be temporary and reversible.

241. Therefore, no likely significant direct or indirect physical cumulative effects during construction are predicted over and above the effects of North Falls (minor adverse) which is not significant in EIA terms.

Impact 4: Loss of soil to erosion

242. Soil can be susceptible to erosion, with some soil types more susceptible than others under certain weather conditions. Excavation, storage and reinstatement exposes the soils and creates an opportunity for potential erosion to occur.

243. The overlapping footprint of both onshore project areas means that there is the potential for direct and indirect physical cumulative effects on soil loss due to erosion whereby the same soils are disturbed on two occasions potentially separated by a gap in construction.

244. As both projects will adopt mitigation measures to reduce any effects from loss of soil resource by erosion (as set out in Table 22.3), no likely significant direct or indirect physical cumulative effects during construction are predicted over and above the effects of North Falls (negligible adverse).

245. With these mitigation measures in place, direct and indirect physical cumulative effects during construction are anticipated to not be significant in EIA terms.

22.8.3.1.3 During construction: Land Use

Impact 5: Impact to Agri-environment schemes

246. During the construction period there would be the potential for impacts (ecological and financial) on agri-environment schemes within the onshore project area of both projects. Depending on the agreement objectives and location of the construction works, the impacts could range from the agreement ceasing entirely to no impact on the agreement. As such, this cumulative assessment looks at the effects in general terms rather than on an agreement-by-agreement basis.

247. The overlapping footprint of both onshore project areas means that there is the potential for direct and indirect physical cumulative effects on agri-environment schemes whereby the same agri-environment schemes are disturbed on two occasions potentially separated by a gap in construction.

248. Following the completion of construction, the landfall and onshore cable route areas subject to agri-environmental agreements would be reinstated. Therefore, any cumulative change to agri-environmental agreements will be temporary and reversible.

249. As such, no likely significant direct or indirect physical cumulative effects during construction are predicted over and above the effects of North Falls (minor adverse) which is not significant in EIA terms.

22.8.3.1.4 During operation: Agriculture

Impact 1: Permanent loss of agricultural land

250. Permanent loss of agricultural land will occur within the onshore substation works areas for both projects under construction scenario 3. There is the potential for interaction with the onshore substation infrastructure of Five Estuaries which is to be located within close proximity to the North Falls onshore substation. Permanent loss of agricultural land during operation will occur within the onshore substation works area.

251. Five Estuaries will give rise to 5.58ha of land permanently lost to agriculture during operation. This means 11.94ha will be permanently lost across the two projects, representing 0.004% of the county resource.

252. This increase does not change the magnitude of impact assessed for North Falls in Section 22.6.3.2, and as such cumulative effects for North Falls and Five Estuaries remain major adverse, and significant in EIA terms.

22.8.3.1.5 During decommissioning

253. No decision has been made regarding the final decommissioning policy for North Falls or Five Estuaries as it is recognised that industry good practice, rules and legislation change over time. The detailed decommissioning activities and

methodology would be determined later within both projects' lifetime so as to be in line with latest and current guidance, policy and legislation at that point. At that juncture, the decommissioning methodology would be agreed with the relevant authorities and statutory consultees. Onshore, decommissioning is likely to include removal or reuse of the onshore substation with the cables and jointing bays left in situ or removed. The cumulative effects are expected to be the same as, or less than, those of the initial construction phase.

22.8.3.1.6 Summary

254. Table 22.20 below provides a summary of the potential significant cumulative effects identified during the land use and agricultural CEA in relation to Five Estuaries Offshore Wind Farm.

Table 22.20 Summary of the potential significant cumulative effects in relation to Five Estuaries for Land Use and Agriculture

Potential impact	Cumulative effect	Additional mitigation
Construction		
Impact 1: Agricultural drainage	Minor adverse Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A
Impact 2: Temporary loss of agricultural land	Moderate adverse Therefore, significant in EIA terms (same as North Falls alone assessment).	No additional mitigation is proposed over and above that set out in Table 22.3 as embedded mitigation.
Impact 3: Soil degradation	Minor adverse Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A
Impact 4: Loss of soil to erosion	Negligible adverse Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A
Impact 5: Impact to agri-environment schemes	Minor adverse Therefore, significant in EIA terms (same as North Falls alone assessment).	No additional mitigation is proposed over and above that set out in Table 22.3 as embedded mitigation.
Operation		
Impact 1: Permanent change to land use	Major adverse Therefore, significant in EIA terms (same as North Falls alone assessment).	No additional mitigation is proposed over and above that set out in Table 22.3 as embedded mitigation.

22.8.3.2 North Falls, Five Estuaries and other projects

255. Based on the project screening in Table 22.19, in addition to Five Estuaries Offshore Wind Farm, one of the other listed projects will be included in the CEA for further assessment: Norwich to Tilbury. This section provides the conclusions of the CEA for North Falls, Five Estuaries and Norwich to Tilbury.

22.8.3.2.1 During construction

256. Cumulative effects from Five Estuaries and other projects during construction are shown in Table 22.21.

22.8.3.2.2 During operation

257. Cumulative effects from Five Estuaries and other projects during operation are shown in Table 22.22.

Table 22.21 Cumulative effects from Five Estuaries and other projects on land use and agriculture during construction

Project	Cumulative effect 1: Impacts on agricultural drainage	Cumulative effect 2: Temporary loss of agricultural land	Cumulative effect 3: Soil degradation	Cumulative effect 4: Loss of soil to erosion	Cumulative effect 5: Impacts on Agri-environment schemes
Five Estuaries and Norwich to Tilbury	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls onshore substation. Construction activities for Five Estuaries and Norwich to Tilbury will very likely affect the agricultural drainage adjacent to those land parcels described in Section 22.6.1.1. Therefore cumulative effects from Five Estuaries and Norwich to Tilbury projects could occur to agricultural drainage. North Falls and Five Estuaries have committed to reinstating agricultural drainage following construction, which will be secured in	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls and Five Estuaries onshore substations. A temporary loss of agricultural land for Norwich to Tilbury, Five Estuaries and the North Falls project is expected as the construction activities (including onshore cable route, temporary construction compounds and off route haul road) are planned in close proximity to, if not spatially overlapping, one another. Within each project's assessment, the temporary loss of BMV land within Essex county has been quantified as follows: • North Falls = 288ha • Five Estuaries = 255ha	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls onshore substation. Construction activities for both projects will very likely affect soils parcels adjacent to those described in Sections 22.6.1.3 and 22.6.1.4. Therefore cumulative effects from both projects could occur to soils. North Falls has committed to embedded mitigation measures such as reducing the footprint of the works, limiting the exposure time and setting out the procedures for the appropriate handling of soils during construction works, which will be secured in the final CoCP and SMP (see Table 22.3).	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls onshore substation. Construction activities for both projects will very likely affect soils parcels adjacent to those described in Sections 22.6.1.3 and 22.6.1.4. Therefore cumulative effects from both projects could occur to soils. North Falls has committed to embedded mitigation measures such as reducing the footprint of the works, limiting the exposure time and setting out the procedures for the appropriate handling of soils during construction works, which will be secured in the final CoCP and SMP (see Table 22.3). In light of this, cumulative effects are anticipated to be	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls onshore substation. Construction activities for Norwich to Tilbury has the potential to affect nearby agri-environment schemes to those affected by North Falls. Therefore cumulative effects from both projects could occur to agri-environment schemes. North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements wherever possible, and to implement ecological mitigation to minimise the effects on the features of any agri-environment scheme. In light of this, cumulative effects are anticipated to be no greater than that assessed for North Falls alone (minor adverse, and not significant in EIA terms).

Project	Cumulative effect 1: Impacts on agricultural drainage	Cumulative effect 2: Temporary loss of agricultural land	Cumulative effect 3: Soil degradation	Cumulative effect 4: Loss of soil to erosion	Cumulative effect 5: Impacts on Agri-environment schemes
	the final CoCP and SMP (see Table 22.3). It is likely that Norwich to Tilbury will adopt similar reinstatement commitments. In light of this, cumulative effects are anticipated to be no greater than that assessed for North Falls alone (minor adverse, and not significant in EIA terms).	• Norwich to Tilbury = 1,929ha[3] In the context of the regional resource, the temporary loss of approximately 2,472ha of BMV agricultural land across North Falls, Five Estuaries and Norwich to Tilbury, accounts for approximately 0.8% of the available county resource. These effects have the potential to occur for over >2 years, and therefore the magnitude of effect would increase to 'medium' from the effects assessed for North Falls alone. The project would therefore give rise to cumulative effects of major adverse significance. Following construction, North Falls will reinstate the surface of the affected land to a condition similar to that which existed prior to entry being taken, and	In light of this, cumulative effects are anticipated to be no greater than that assessed for North Falls alone (minor adverse, and not significant in EIA terms).	no greater than that assessed for North Falls alone (negligible adverse, and not significant in EIA terms).	

[3] No definitive value for the % of the Norwich to Tilbury project located within Essex is provided in the Norwich to Tilbury PEIR, however, it is estimated to be approximately 50% of the total 3,858ha[3] of the scheme.

Project	Cumulative effect 1: Impacts on agricultural drainage	Cumulative effect 2: Temporary loss of agricultural land	Cumulative effect 3: Soil degradation	Cumulative effect 4: Loss of soil to erosion	Cumulative effect 5: Impacts on Agri-environment schemes
		as evidenced by a pre-entry schedule of condition. Soil management measures for North Falls will be secured within the final CoCP and SMP. Five Estuaries and Norwich to Tilbury will secure equivalent measures for soil management within their projects' CoCP. Operational cumulative effects of permanent change to land use are discussed further in Table 22.22.			

Table 22.22 Cumulative effects from Five Estuaries and other projects on land use and agriculture during operation

Project	Cumulative effect 1: Permanent loss of agricultural land
Five Estuaries and Norwich to Tilbury	A new onshore substation is proposed to be built as part of the Norwich to Tilbury proposals by National Grid. The Norwich to Tilbury substation would be near the preferred location for the North Falls and Five Estuaries onshore substations. The permanent land take for the operational infrastructure, notably the onshore substations and associated ancillary works, for North Falls, Five Estuaries and Norwich to Tilbury is expected to be situated in the vicinity of one another. This has the potential to lead to a cumulative permanent loss of Grades 1, 2 and 3a (BMV) agricultural land during operation. Within each project's assessment, permanent loss of BMV land has been quantified as follows: • North Falls = 6.36 ha • Five Estuaries = 5.58 ha • Norwich to Tilbury = 50.15 ha In the context of the regional and national resource, the permanent loss of approximately 62.1ha of BMV agricultural land across North Falls, Five Estuaries and Norwich to Tilbury, accounts for approximately 0.02% of the available county resource. Due to the relatively small area of permanent operational infrastructure in the context of the regional resource, and the additional landscaping footprint which may have the potential to mitigate the loss in soil functions, the cumulative effect of the three onshore substations is considered to be no greater than that assessed for North Falls alone (major adverse, and significant in EIA terms).

22.8.3.3.1 During decommissioning

258. Decommissioning strategies have not yet been finalised for North Falls, Five Estuaries or Norwich to Tilbury; however, the cumulative impacts are expected to be the same as those of the initial construction phase.

22.9 Transboundary effects

259. There are no transboundary effects with regards to land use and agriculture as the onshore project area would not be sited in proximity to any international boundaries. Transboundary effects are therefore scoped out of this assessment and are not considered further.

22.10 Interactions

260. Onshore chapters tend to be topic based and the same receptor may be assessed in multiple chapters, e.g. a residential property may be assessed separately for noise, air quality, traffic and visual impacts. There is the potential for these separate impacts to interact, spatially and temporally, to create interactions on a receptor. Where there are impacts to the same receptors across chapters these should be indicated in Table 22.23.

Table 22.23 Land use and agriculture interactions

Topic and description	Related chapter (Volume 3.1)	Where addressed in this chapter	Rationale
Construction			
Soil degradation and loss of soil to erosion	ES Chapter 19 Ground Conditions and Contamination (Document Reference: 3.1.21)	Sections 22.6.1.3 and 22.6.1.4.	Changes in soil quality could affect ground conditions and potential contaminated land.
	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25)	Sections 22.6.1.3 and 22.6.1.4.	Changes to land uses could affect ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
	ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference: 3.1.27)	Sections 22.6.1.3 and 22.6.1.4.	Likely significant effects on soils could affect any buried archaeology present.
Agricultural drainage	ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)	Section 22.6.1.1.	Likely significant effects on drainage could lead to changes in flood risk or water resources e.g. private water supplies
Temporary loss of land for agriculture	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25)	Section 22.6.1.2.	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
	ES Chapter 30 Landscape and Visual Impact Assessment	Section 22.6.1.2.	Changes to land uses could impact on the

Topic and description	Related chapter (Volume 3.1)	Where addressed in this chapter	Rationale
	(Document Reference: 3.1.32)		landscape and visual amenity.
Impacts on agri-environment schemes	ES Chapter 23 Onshore Ecology (Document Reference: 3.1.25)	Section 22.6.2.1.	Changes to land uses could affect ecological receptors for example the removal of trees or hedgerows or the loss of land under agri-environment schemes.
	ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference: 3.1.27)	Section 22.6.2.1.	Likely significant effects on land use could affect any buried archaeology present.
Impacts on utilities	ES Chapter 25 Onshore Archaeology and Cultural Heritage (Document Reference: 3.1.27)	Section 22.6.2.2.	Likely significant effects on land use could affect any buried archaeology present.
Operation			
Agricultural drainage	ES Chapter 21 Water Resources and Flood Risk (Document Reference: 3.1.23)	Section 22.6.3.1.	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies.
Permanent loss of land for agriculture	ES Chapter 30 Landscape and Visual Impact Assessment (Document Reference: 3.1.32)	Section 22.6.3.2.	Changes to land uses could impact on the landscape and visual amenity.
	ES Chapter 31 Socio-Economics (Document Reference: 3.1.33)	Section 22.6.3.2.	Changes in the agricultural industry may affect the socio-economics of the region.
Decommissioning			
Impacts associated with the decommissioning phase are currently unknown but would be no greater than those identified for the construction phase.			

22.11 Inter-relationships

261. The impacts identified and assessed in this chapter have the potential to interrelate with each other. The areas of potential inter-relationships between impacts are presented in Table 22.24. This provides a screening tool for which impacts have the potential to interrelate. Table 22.25 provides an assessment for each receptor (or receptor group) as related to these impacts.

262. Within Table 22.25 the impacts are assessed relative to each development phase (i.e. construction, operation or decommissioning) to see if (for example) multiple construction impacts affecting the same receptor could increase the significance of effect upon that receptor. Following this, a lifetime assessment is undertaken which considers the potential for impacts to affect receptors across all development phases.

Table 22.24 Inter-relationships between impacts - screening

Potential interaction between impacts						
Construction						
	Agricultural Drainage	Temporary loss of agricultural land	Degradation of soil	Soil erosion	Agri-environment schemes	Utilities
Drainage	-	Yes	Yes	Yes	No	No
Temporary loss of agricultural land	Yes	-	Yes	Yes	Yes	Yes
Degradation of soil	Yes	Yes	-	Yes	Yes	No
Soil erosion	Yes	Yes	Yes	-	Yes	No
Agri-environment schemes	No	Yes	Yes	Yes	-	No
Utilities	No	Yes	No	No	No	-

Table 22.25 Inter-relationship between impacts – phase and lifetime assessment

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
Agricultural drainage	Minor adverse	No impact	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities are considered to have a low magnitude of impact on agricultural drainage, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and industry good practice methodologies. Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impact than assessed individually.	**No greater than individually assessed impact.** Agricultural drainage could be affected during the construction and operational phases of North Falls. Land drainage would be reinstated following construction. There is no impact to agricultural drainage anticipated during the lifetime of the onshore substation. It is therefore anticipated that there are no lifetime significant effects for agricultural drainage.
Loss of agricultural land	Moderate adverse	Major adverse	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities are considered to have a medium magnitude of impact on the temporary loss of agricultural land, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and industry good practice methodologies. Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impact than assessed individually.	**No greater than individually assessed impact.** Agricultural land will be affected during the construction and operational phases of North Falls. Temporary agricultural land take during construction will be reinstated to pre-construction condition and North Falls has committed to seek private agreements (or compensation in line with the compulsory purchase compensation code) with relevant landowners/occupiers. It is therefore anticipated that lifetime significant effects would not result in greater impact than assessed individually.
Degradation of soil	Minor adverse	N/A	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities are considered to have a low magnitude of impact on soil	**No greater than individually assessed impact.** Degradation of soil may occur during the construction phase of North Falls.

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
				degradation, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and industry good practice methodologies. Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.	Soils will be reinstated following construction to their original condition. It is therefore anticipated that there are no lifetime significant effects for soils.
Soil erosion	Negligible adverse	N/A	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities are considered to have a low magnitude of impact on soil erosion, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and industry good practice methodologies. Therefore it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.	**No greater than individually assessed impact.** Soil erosion may occur during the construction phase of North Falls. Soils will be reinstated following construction to their original condition. It is therefore anticipated that there are no lifetime significant effects for soils.
Agri-environment schemes	Moderate adverse	No impact	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities are considered to have a low magnitude of impact on agri-environment schemes, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed with standard and industry good practice methodologies.	**No greater than individually assessed impact.** Agri-environment schemes will be affected during the construction and operational phases of North Falls. North Falls has committed to the avoidance of land parcels that are subject to agri-environment scheme agreements, wherever possible.

Receptor	Highest significance level			Phase assessment	Lifetime assessment
	Construction	Operation	Decommissioning		
				Therefore, it is considered that there would either be no interactions between the phases, or that these would not result in greater impacts than are assessed individually.	It is therefore anticipated that there are no lifetime significant effects for agri-environment schemes.
Utilities	No impact	No impact	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities will have no impact on utilities. are considered to have a low magnitude of impact on utilities, with significance of effect dependent upon the sensitivity of the receptor. Each impact would be managed through protective provisions as set out in the DCO and/or side agreements. Therefore it is considered that there would be no interactions between the phases, or that these would not result in greater impact than assessed individually.	**No greater than individually assessed impact.** Utilities will not be affected during the construction phase of North Falls. Protective provisions and/or side agreements will be agreed with affected utilities as part of the DCO application process. North Falls will undertake utility crossings or diversions in accordance with the appropriate industry standards for such crossings. It is therefore anticipated that there are no lifetime significant effects for utilities.
Soil heating	N/A	No impact	Considered to be the same significance level as construction, or no worse.	**No greater than individually assessed impact.** Construction activities will have no impact on soil heating. Therefore it is considered that there would be no interactions between the phases.	**No greater than individually assessed impact.** Soil heating effects will not occur during the operational phase of North Falls. It is therefore anticipated that there are no lifetime significant effects for soil heating.

22.12 Summary

263. This chapter has provided a characterisation of the existing environment for land use and agriculture based on both existing and site-specific survey data. The EIA has established that land use and agriculture receptors could be affected as a result of direct and indirect impacts during the construction, operation and decommissioning phases.

264. Where there are multiple possible outcomes depending on, for example, whether construction works would involve trenchless or open-trench installation in a relevant area, the worst-case scenario (which involves the greater magnitude of impact) is listed in Table 22.26, below.

265. During construction, the temporary loss of agricultural land Grades 1-3a (BMV land) results in a moderate adverse significance of effect. Cumulatively, impacts to agricultural land are likely to be moderate adverse. These effects are temporary and fully reversible once construction is complete. Where practicable and in order to reduce impacts on agricultural productivity, the planning and timings of works will be discussed with landowners and occupiers. An OCoCP has been submitted alongside the DCO application, which includes appointment of an ALO and appropriate discussions to be had with landowners, with contractors would be obliged to legally comply with.

266. Following construction, the affected agricultural land will be reinstated to pre-construction condition and where this is not possible the Project will seek to reach private agreements with relevant landowners/occupiers. Where land is still not reinstated to its former condition, the Project will have a statutory obligation to pay compensation to landowners under the Compensation Code.

267. During operation, the majority of impacts to land use and agriculture are limited. This is because the onshore cable route is buried. However, the permanent loss of ALC Grade 1 (BMV) agricultural land during operation at the onshore substation and loss of ALC Grade 2 agricultural land at the Bentley Road improvement works results in an effect of major adverse significance. Cumulatively, impacts to agricultural land are also likely to be major adverse. Private agreements would be sought with the relevant landowners/occupiers regarding any permanent loss of land incurred. The projects has ensured that the Project's operational footprint has been minimised as far as possible to reduce the degree of effect predicted.

268. The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, impacts during the decommissioning stage are assumed to be the same as those identified during the construction phase.

Table 22.26 Summary of potential likely significant effects on land use and agriculture

Potential impact	Receptor	Sensitivity	Magnitude of impact	Significance of effect	Additional Mitigation measures proposed	Residual effect
Construction						
Impact 1: Potential for earthworks associated with construction to impact natural and artificial field drainage systems	Agricultural drainage receptors within the onshore project area	Medium	Low	Minor adverse, not significant	N/A	Minor adverse, not significant
Impact 2: Temporary loss of agricultural land during construction	Agricultural land within the onshore project area	High	Low	Moderate adverse, significant	No additional mitigation measures proposed	Moderate adverse, significant
Impact 3: Potential for soils to become compacted and for soil structure to deteriorate during construction works	Soils within the onshore project area	Medium	Low	Minor adverse, not significant	N/A	Minor adverse, not significant
Impact 4: Excavation, storage and reinstatement during construction exposes the soils and potentially leads to soil erosion	Soils within the onshore project area	Low	Low	Negligible adverse, not significant	N/A	Negligible adverse, not significant
Impact 5: During construction there would be potential ecological and financial impacts on agri-environment schemes	Agri-environment schemes within the onshore project area	High	Negligible	Minor adverse, not significant	N/A	Minor adverse, not significant
Impact 6: During construction there would be potential impacts on existing utilities	Utilities crossing the onshore project area	Low	No impact	No impact	N/A	N/A
Operation						
Impact 7: Permanent above ground infrastructure at the onshore substation as well as presence of buried cables has the potential to affect field / land drainage during operation	Agricultural drainage within the onshore project area	Low	No impact	No impact	N/A	N/A
Impact 8: Permanent Loss of agricultural land during operation	Agricultural land within the onshore project area	High	Medium	Major adverse, significant	No additional mitigation measures proposed	Major adverse, significant

Potential impact	Receptor	Sensitivity	Magnitude of impact	Significance of effect	Additional Mitigation measures proposed	Residual effect
Impact 9: Transmission of electricity resulting in small energy losses in the form of heat dissipation	Soils within the onshore project area	Low	No impact	No impact	N/A	N/A
Impact 10: Loss of land under agri-environment schemes	Agri-environment schemes within the onshore project area, notably the onshore substation works area	High	No impact	No impact	N/A	N/A
Impact 11: Potential for maintenance activities to affect utilities, since maintenance may require access to buried cables	Utilities within the onshore project area	Low	No impact	No impact	N/A	N/A
Decommissioning						
It is anticipated that the decommissioning impacts will be no worse than those for construction.						

Table 22.25 Summary of potential cumulative effects on Land Use and Agriculture

Potential impact	Cumulative effect	Additional mitigation
Construction		
Cumulative effect 1: Potential for earthworks associated with construction to impact natural and artificial field drainage systems	Minor adverse Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A
Cumulative effect 2: Temporary loss of agricultural land during construction	Major adverse Therefore, significant in EIA terms (increased from North Falls alone assessment).	N/A
Cumulative effect 3: Potential for soils to become compacted and for soil structure to deteriorate during construction works	Minor adverse Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A

Potential impact	Cumulative effect	Additional mitigation
Cumulative effect 4: Excavation, storage and reinstatement during construction exposes the soils and potentially leads to soil erosion	Negligible Therefore, not significant in EIA terms (same as North Falls alone assessment).	N/A
Cumulative effect 5: During construction there would be potential ecological and financial impacts on agri-environment schemes	Minor adverse Therefore, significant in EIA terms (same as North Falls alone assessment).	N/A
Operation		
Cumulative effect 1: Permanent loss of agricultural land during operation	Major adverse Therefore, significant in EIA terms (same as NF alone assessment).	N/A
Decommissioning		
Decommissioning strategies have not yet been finalised for North Falls, Five Estuaries or Norwich to Tilbury; however, the cumulative effects are expected to be the same as those of the initial construction phase.		

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