Dudgeon and Sheringham Shoal Offshore Wind Farm Extensions

Preliminary Environmental Information Report

Volume 1

Chapter 21 - Land Use, Agriculture and Recreation

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Glossary of Acronyms

ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
AONB	Area of Outstanding Natural Beauty
BMV	Best and most versatile
CIA	Cumulative Impact Assessment
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way Act
DCO	Development Consent Order
DECC	Department for Energy and Climate Change
DEFRA	Department for the Environment and Rural Affairs
DEP	Dudgeon Extension Project
DMRB	Design Manual for Roads and Bridges
DOW	Dudgeon Offshore Wind Farm
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EC	European Commission
EIA	Environmental Impact Assessment
ELF	Electric and Magnetic Field
ELS	Entry Level Stewardship
EMF	Extremely Low Frequency
ES	Environmental Statement
ESS	Environmental Stewardship Schemes
EU	European Union
FRA	Flood Risk Assessment
HDD	Horizontal Directional Drilling
HLS	Higher Level Stewardship
MAFF	Ministry of Agriculture, Fisheries and Food
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OELS	Organic Entry Level Stewardship
OWF	Offshore Wind Farm

PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PRoW	Public Rights of Way
SAC	Special Area of Conservation
SEP	Sheringham Shoal Extension Project
SMP	Soil Management Plan
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest

Glossary of Terms

The Applicant	Equinor New Energy Limited
DCO boundary	Final application boundary based on a 45-60m wide onshore cable corridor, one substation location and landfall within which the onshore infrastructure will be located.
Dudgeon Offshore Wind Farm Extension site	The Dudgeon Offshore Wind Farm Extension offshore wind farm boundary.
The Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the Environmental Impact Assessment (EIA) and Habitats Regulations Assessment (HRA) for certain topics.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Jointing bays	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The point on the coastline at which the offshore export cables are brought onshore and connected to the onshore export cables.
Onshore substation sites	Parcels of land within onshore substation zones A and B, identified as the most suitable location for development of the onshore substation. Two sites have been identified for further assessment within the PEIR.
Onshore substation zone	Parcels of land within the wider onshore substation search area identified as suitable for development of the onshore substation. Two substation zones (A and B) have been identified as having the greatest potential to accommodate the onshore substation.

Onshore cable corridor	The area between the landfall and the onshore substation sites, within which the onshore cable circuits will be installed along with other temporary works for construction.
PIER boundary	The area subject to survey and preliminary impact assessment to inform the PEIR, including all permanent and temporary works for DEP and SEP. The PEIR boundary will be refined down to the final DCO boundary ahead of the application for development consent.
Sheringham Shoal Offshore Wind Farm Extension site	Sheringham Shoal Offshore Wind Farm Extension offshore wind farm boundary.
The Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Offshore Wind Farm Extension site as well as all onshore and offshore infrastructure.
Study area	Area where potential impacts from the project could occur, as defined for each individual EIA topic.

21 LAND USE, AGRICULTURE AND RECREATION

21.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) provides a description of the key components of the proposed Dudgeon Offshore Wind Farm Extension Project (hereafter DEP) and Sheringham Shoal Offshore Wind Farm Extension Project (hereafter SEP) in relation to potential on land use, agriculture and recreation. The chapter provides an overview of the existing environment for the proposed onshore development area, followed by an assessment of the potential impacts and associated mitigation for the construction, operation, and decommissioning phases of DEP and SEP.
2. This assessment has been undertaken with specific reference to the relevant legislation and guidance, of which the primary source are the National Policy Statements (NPS) for energy infrastructure. Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Impact Assessment (CIA) are presented in **Section 21.4**.
3. The assessment should be read in conjunction with following linked chapters:
   - **Chapter 19 Ground Conditions and Contamination**;
   - **Chapter 22 Onshore Ecology and Ornithology**;
   - **Chapter 23 Onshore Archaeology and Cultural Heritage**;
   - **Chapter 25 Noise and Vibration**;
   - **Chapter 26 Traffic and Transport**;
   - **Chapter 27 Seascape and Visual Impact Assessment**;
   - **Chapter 28 Landscape and Visual Impact Assessment**;
   - **Chapter 29 Socio-Economics and Tourism**; and
   - **Chapter 30 Health**.

21.2 Consultation

4. Consultation with regards to Land use, Agriculture and Recreation has been undertaken in line with the general process described in **Chapter 6 EIA Methodology**. The key elements to date have included scoping and public consultation undertaken in July 2020, as well as ongoing engagement with the landowners affected by the PEIR boundary. The feedback received has been considered in preparing the PEIR. **Table 21–1** provides a summary of how the consultation responses received to date have influenced the approach that has been taken.
5. This chapter will be updated following the consultation on the PEIR in order to produce the final assessment that will be submitted with the Development Consent Order (DCO) application. Full details of the consultation process will also be presented in the Consultation Report alongside the DCO application.

Table 21–1: Consultation responses.

Consultee	Date/ Document	Comment	Project Response
Planning Inspectorate	19/11/19 Scoping Response	**Temporary closure/diversion of PRoW** The Inspectorate agrees with the Applicant's proposal to assess the impact of temporary closure/diversions of PRoW during construction and decommissioning and the impact of permanent closures/diversions during operation. The Planning Inspectorate recognises that this is scoped in as part of section 4.4 of the Scoping Report (tourism). Cross referencing should be made between these topics as appropriate.	Impacts to Public Rights of Way (PRoW) during construction and operation are considered in **Sections 21.6.1.10** and **21.6.2.5** respectively.
Planning Inspectorate	19/11/19 Scoping Response	**Impact on Existing Utilities** The Scoping Report does not justify the decision to scope out the impact on existing utilities during operation. However, the Inspectorate considers that given the operational nature of the Proposed Development, there are unlikely to be any significant effects on existing utilities once construction is complete. The Inspectorate agrees that this matter can be scoped out of the assessment.	Impacts on utilities during operation are assessed in **Section 21.6.2.4.** Potentially affected utility providers would be contacted and the location of existing services would be identified prior to maintenance works to ensure there would be no impact.

Consultee	Date/ Document	Comment	Project Response
Planning Inspectorate	19/11/19 Scoping Response	**Permanent loss of Land** The Inspectorate is content that this matter is only relevant to the operational phase with no significant effects anticipated during construction and decommissioning and therefore can be scoped out of the assessment for construction and decommissioning.	Impacts on permanent loss of land during operation are assessed in **Section 21.6.2.2.**
Planning Inspectorate	19/11/19 Scoping Response	**Transboundary impacts** Table 3-7 proposes to scope out transboundary impacts to land use and agriculture, although no clear justification is provided within the aspect chapter. Nevertheless, given the nature of the Proposed Development the Inspectorate agrees that significant transboundary effects are unlikely and therefore this matter can be scoped out of the ES.	Transboundary impacts are scoped out of the assessment. Further details are provided in **Section 21.8**.
Planning Inspectorate	19/11/19 Scoping Response	**Permanent loss of land** The ES should confirm the worst case scenario for permanent land take from the presence of link boxes along the cable route. Any likely significant effects should be assessed in the ES.	Permanent land take from the presence of link boxes is considered in **Sections 21.6.1.1**, **21.6.2.2** and **21.6.2.4**.
Planning Inspectorate	19/11/19 Scoping Response	**Drainage** The ES should explain how land drainage would be reinstated following the completion of construction activities.	Impact mitigation outlined in **Section 21.6.1.1**describes the strategy for reinstating land drainage.

Consultee	Date/ Document	Comment	Project Response
Planning Inspectorate	19/11/19 Scoping Response	**Rights of Way, Access land, Coastal access and National Trail** The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on the adjacent/nearby Norfolk Coast Path National Trail. The National Trails website www.nationaltrail.co.uk provides information including contact details for the National Trail Officer. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.	Impacts to access land, public open land, rights of way and coastal access routes and mitigation measures are considered in **Sections 21.6.1.10**, **21.6.1.11** and **21.6.2.5**
Planning Inspectorate	19/11/19 Scoping Response	**Public Rights of Way** The installation of the on-shore cables has the potential to impact the Norfolk Coast Path, which follows the same route as the England Coast Path (ECP) in the locations where landfall is being considered. The Coast Path is managed by Norfolk County Council and is a heavily used recreational trail which brings significant benefits to the local economy. The County Council would wish to minimise impacts on this National Trail during construction.	Impacts to the Norfolk Coast Path during construction and subsequent mitigation measures are considered in **Sections 21.6.1.8** and **21.6.1.10**.

Consultee	Date/ Document	Comment	Project Response
Planning Inspectorate	19/11/19 Scoping Response	**Public Rights of Way** In addition to the Coast Path and the wider Public Rights of Way network, there are several County Trails and promoted circular walks that could be impacted during construction. Full details of County Council trails and promoted walks can be found on the County Council website https://www.norfolk.gov.uk/out-and-about-in-norfolk. We would particularly draw attention to the Marriott's Way which receives particularly heavy usage where it is crossed by the proposed cable corridor route in two separate locations. The Norfolk Trails team collect data on trail usage, and this can be provided for relevant locations in due course should it be required.	Impacts to county trails during construction are considered in **Section 21.6.1.10**.
Planning Inspectorate	19/11/19 Scoping Response	**Public Rights of Way** The Construction Code of Practice Document, and the Public Rights of Way Management Plan (presumably part of the former document), will be the method that will be used to agree potential impacts on the ECP, Norfolk Trails, the PRoW network and other promoted walks. The County Council agree with this approach and will work with the applicant in this regard.	An Outline Code of Construction Practice (OCoCP) Document including mitigation measures in relation to PRoW will be submitted with DCO. Impacts on the ECP, Norfolk Trails, and the PRoW network during construction and subsequent mitigation measures are presented in **Sections 21.6.1.8** and **21.6.1.10**

21.3 Scope

21.3.1 Study Area

6. The study area for Land use, Agriculture and Recreation has been defined on the basis of the anticipated direct and indirect impacts. It is assumed that direct impacts will not occur outside of the PEIR boundary (within which the final locations for the landfall, onshore cable corridor and onshore substation will be defined in the DCO application). The study area for direct impacts was therefore limited to the PEIR boundary (including and the two substation site options) to allow for the variance in final location and alignments (see **Figure 21.1**).

7. It is assumed that indirect impacts could occur outside of the study area above and therefore additional study areas have also been identified:

- Local or parish boundary: this study area is used to provide the first point on the scale to assess impacts at a local level;
- Local authority boundary: this is the study area to provide the second point on the scale to put impacts into the district context; and
- County boundary is used to provide the third point on the scale to assess impacts at a county level in Norfolk.

8. The direct impact study area and local parish and local authority boundaries are shown in **Figure 21.1**.

21.3.2 Realistic Worst Case Scenario

21.3.2.1 General Approach

9. The final design of DEP and SEP will be confirmed through detailed engineering design studies that will be undertaken post-consent to enable the commencement of construction. 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 terms of the potential 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 lesser options will have less impact. Further details are provided in **Chapter 6 EIA Methodology**.

10. The realistic worst case scenarios for the Land use, Agriculture and Recreation assessment are summarised in **Table 21–2**. These are based on DEP and SEP parameters described in **Chapter 5 Project Description**, which provides further details regarding specific activities and their durations.

11. In addition to the design parameters set out in **Table 21–3**, consideration is also given to how DEP and SEP will be built out as described in **Section 21.3.2.2** to **Section 21.3.2.4** below. This accounts for the fact that whilst DEP and SEP are the subject of one DCO application, it is possible that either one or both DEP and SEP will be developed, and if both are developed, that construction may be undertaken either concurrently or sequentially.

12. At this stage of the PEIR assessment, for Land use, Agriculture and Recreation, the direct impact study area (PEIR boundary) represents a typically 200m wide onshore cable corridor from the landfall to the onshore substation site options. Within this PEIR boundary, a preferred 60m wide onshore cable corridor will be identified (increasing to 100m at trenchless crossings), which will form the basis of the DCO application. The worst-case scenarios presented in **Table 21–2** is based on the worst-case footprint for each of the three build out scenarios described above.

Table 21–2: Realistic worst-case scenarios

Impact	DEP or SEP in isolation	DEP and SEP concurrently	DEP and SEP sequentially	Notes and Rationale
Construction				
Impacts relating to the landfall	<u>Temporary HDD works</u> • HDD temporary works compound area = 5,750m^2 • Transition joint bay size = 10 x 15m. • Total construction space required = 30,000m^2	<u>Temporary HDD works</u> • HDD temporary works compound area = 5,750m^2 • Transition joint bay size = 15 x 15m. • Total construction space required = 30,000m^2	<u>Temporary HDD works</u> • HDD temporary works compound area = 5,750m^2 for each project (overlapping) • Transition joint bay size = 10 x 15m for each project • Total construction space required for each project = 30,000m^2 (overlapping)	The HDD works should not require any prolonged periods of restrictions or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access.
	<u>Temporary access</u> • Route from the existing road system	<u>Temporary access</u> • Route from the existing road system	<u>Temporary access</u> • Route from the existing road system	
Impacts relating to the onshore cable corridor	<u>Temporary access</u> • Various from public highway (6m wide) to single tracks (3m wide). • Access haul road dimensions = 60km long by 6m wide.	<u>Temporary access</u> • Various from public highway (6m wide) to single tracks (3m wide). • Access haul road dimensions = 60km long by 6m wide.	<u>Temporary access</u> • Various from public highway (6m wide) to single tracks (3m wide). • Access haul road dimensions = 60km long by 6m wide.	The onshore cable duct will be installed in sections of up to 1km at a time, with a typical construction presence of up to four weeks along each 1km section.

Impact	DEP or SEP in isolation	DEP and SEP concurrently	DEP and SEP sequentially	Notes and Rationale
	Duration • 24 months in total	Duration • 24 months in total	Duration • 24 months in total	
	Material volumes • Width of top soil storage = 6m • Quantity of material excavated for cable trench = 180,000m^3 of which 36,000m^3 to be disposed of	Material volumes • Width of top soil storage = 6m • Quantity of material excavated for cable trench = 360,000m^3 of which 72,000m^3 to be disposed of	Material volumes • Width of top soil storage = 6m • Quantity of material excavated for cable trench = 360,000m^3 of which 72,000m^3 to be disposed of	
	Construction corridor • Total width = 45m • Jointing bays = 120 (approximately every 500m) buried below ground • Jointing bay dimensions = 12m long by 4m wide by 2m deep within the working corridor • One trench, 1m wide by 1.75m deep. • Minimum cable burial depth at 1.2m	Construction corridor • Total width = 60m • Approximately 120 jointing bays (one every 500m) buried below ground • Jointing bay dimensions = 12m long by 4m wide by 2m deep within the working corridor. • Two trenches, each 1m wide by 1.75m deep. • Minimum cable burial depth at 1.2m	Construction corridor • Total width = 60m • Approximately 240 jointing bays (one every 500m) buried below ground along each cable trench • Jointing bay dimensions of 12m long by 4m wide by 2m deep within the working corridor. • Two trenches, each 1m wide by 1.75m deep. • Minimum cable burial depth at 1.2m	

Impact	DEP or SEP in isolation	DEP and SEP concurrently	DEP and SEP sequentially	Notes and Rationale
	Construction compounds • Up to 2 main compounds of 60,000m^2 each • 8 secondary compounds of 2,500m^2 each • HDD compounds = 1,500m^2 - 4,500m^2	Construction compounds • Up to 2 main compounds of 60,000m^2 each • 8 secondary compounds of 2,500m^2 each • HDD compounds = 1,500m^2 - 4,500m^2	Construction compounds • Up to 2 main compounds for each project of 60,000m^2 each • 8 secondary compounds for each project of 2,500m^2 each • HDD compounds = 1,500m^2 - 4,500m^2	
Impacts relating to the onshore substation	Substation footprint • Permanent area = 3.25ha. • Additional construction area = 1ha • Total construction area = 4.25ha	Substation footprint • Permanent area = 6.0ha • Additional construction area = 1ha • Total construction area = 7.0ha.	Substation footprint • Permanent area = 6.25ha • Additional construction area = 1ha • Total construction area = 7.25ha.	
	Duration • 36 months in total	Duration • 36 months in total	Duration • 36 months in total for each project	

Impact	DEP or SEP in isolation	DEP and SEP concurrently	DEP and SEP sequentially	Notes and Rationale
Operation				
Impacts relating to the onshore cable route	<u>Link boxes</u> • Below ground = 120 (up to 2m x 2m x 1.5m) plus an above ground marker post at each location • Above ground = 120 (up to 1.5m x 1m x 1.5m)	<u>Link boxes</u> • Below ground = 120 (up to 2m x 2m x 1.5m) plus an above ground marker post at each location • Above ground = 120 (up to 1.5m x 1m x 1.5m)	<u>Link boxes</u> • Below ground = 120 for each project (up to 2m x 2m x 1.5m) plus an above ground marker post at each location • Above ground = 120 for each project (up to 1.5m x 1m x 1.5m)	Link boxes are expected to be below ground. Alternatively link boxes may be above ground in cabinets.
Impacts relating to the onshore substation	<u>Substation footprint</u> • Operational area = 3.25ha	<u>Substation footprint</u> • Operational area = 6.0ha	<u>Substation footprint</u> • Operational area = 6.25ha	
	<u>Substation buildings</u> • Max building height = 15m • Oily water sump to provide secondary containment to oil from transformers in the event of a spillage.	<u>Substation buildings</u> • Max building height = 15m • Oily water sump to provide secondary containment to oil from transformers in the event of a spillage.	<u>Substation buildings</u> • Max building height = 15m • Oily water sump to provide secondary containment to oil from transformers in the event of a spillage.	
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 best practice change over time. However, it is likely that the onshore project equipment, including the cable, will be removed, reused or recycled where possible and the transition bays and cable ducts being left in place. The detail and scope of the decommissioning works will be determined by the				

Impact	DEP or SEP in isolation	DEP and SEP concurrently	DEP and SEP sequentially	Notes and Rationale
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.				

21.3.2.2 Construction Scenarios

13. The following principles set out the framework for how DEP and SEP may be constructed:
    - DEP and SEP may be constructed at the same time, or at different times;
    - If built at the same time both Projects could be constructed in four years;
    - If built at different times, either Project could be built first;
    - If built at different times the first Project would require a four-year period of construction including a three year onshore construction period. The second Project would require a three-year period of construction;
    - If built at different times, the duration of the gap between end of onshore construction of the first Project, and the start of onshore construction of the second Project may vary from 0 to 1 year;
    - Assuming maximum construction periods, and taking the above into account, the maximum period over which the construction of both Projects could take place is 7 years; and
    - The earliest construction start date is 2024 and the latest is 2028.
14. In order to determine which construction scenario presents the realistic worst case for each receptor and impact, the assessment considers both maximum duration effects and maximum peak effects, in addition to each project being developed in isolation, drawing out any differences between each of DEP and SEP
15. Any differences between DEP and SEP, or differences that could result from the manner in which the first and the second Project is built (concurrent or sequential and the length of any gap) are identified and discussed where relevant in the impact assessment section of this chapter (**Section 21.6**). For each potential impact only the worst case construction scenario for DEP and SEP is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst case is provided, where necessary, in **Section 21.6**.

21.3.2.3 Operation Scenarios

16. Operation scenarios are described in detail in **Chapter 5 Project Description**. The assessment considers the following three scenarios:
    - Only DEP in operation;
    - Only SEP in operation; and
    - DEP and SEP operating at the same time, with a gap of up to 1 year between each project commencing operation.
17. The operational lifetime of each project is expected to be 35 years.

21.3.2.4 Decommissioning Scenarios

18. Decommissioning scenarios are described in detail in **Chapter 5 Project Description**. Decommissioning arrangements will be agreed through the submission of a Decommissioning Plan prior to construction, however for the purpose of this assessment it is assumed that decommissioning of DEP and SEP could be conducted separately, or at the same time.

21.3.3 Summary of Mitigation Embedded in the Design

19. This section outlines the embedded mitigation relevant to the Land use, Agriculture and Recreation assessment, which has been incorporated into the design of DEP and SEP (**Table 21–4**). Where other mitigation measures are proposed, these are detailed in the impact assessment (**Section 21.6**).

Table 21–3: Embedded Mitigation Measures

Parameter	Mitigation Measures Embedded into the Design of DEP and SEP
Site selection	DEP and SEP have undergone an extensive site selection process which has involved incorporating environmental considerations (avoiding residential properties, historic and nature designations and infrastructure e.g. buried cables, railways, roads,) in collaboration with the engineering design requirements (for more information see **Chapter 4 Site Selection and Alternatives**). Land take has been minimised where possible, reducing sterile land parcels, aligning with field boundaries and avoiding the best and most versatile land.
Long HDD at Landfall	Use of HDD at landfall to avoid prolonged periods of restrictions or closures to Welbourne beach and retain access to the beach for the public during the majority of construction. It is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access.

21.4 Impact Assessment Methodology

21.4.1 Policy, Legislation and Guidance

21.4.1.1 National Policy Statements

20. The assessment of potential Land use, Agriculture and Recreation impacts has been made with specific reference to the relevant NPS. These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to DEP and SEP are:

- Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Networks Infrastructure (EN-5) (DECC 2011c).

21. The specific assessment requirements for Land use, Agriculture and Recreation, as detailed in the NPS, are summarised in **Table 21–4** together with an indication of the section of the PEIR chapter where each is addressed.

Table 21–4: NPS Assessment Requirements.

NPS Requirement	NPS Reference	Section Reference
En-1 NPS for Energy (EN-1)		
Paragraph 5.5.7 requests that applicants should include an assessment of the effects of the project on maintaining coastal recreation sites and features.	Paragraph 5.5.7	Closure of either the coastal footpath or the beach will be minimised. Please see **Section 21.6.1.10**.
Paragraph 5.10.5 requests that the Environmental Statement (ES) should identify existing and proposed land uses (as defined in the Town and Country Planning Act 1990) near the project and assess 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. It also states that applicant should also assess any effects of precluding a new development or use proposed in the development plan.	Paragraph 5.10.5	Details on existing or proposed land uses can be found in **Section 21.5.1.1** and new developments or proposed projects are assessed for potential cumulative impacts in **Section 21.7.3**
Paragraph 5.10.6 requests Applicants will need to consult the local community on their proposals to build on open space, sports or recreational buildings and land.	Paragraph 5.10.6	As part of the consultation process DEP and SEP have consulted with statutory and non-statutory stakeholders, local communities, and the public (please see **Chapter 7 Technical Consultations**).
Paragraph 5.10.7 requests that the LPA should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.	Paragraph 5.10.7	As part of the consultation process DEP and SEP have consulted with the relevant local authorities. DEP and SEP have been reviewed against the development plan and other planning applications (see **Section**

NPS Requirement	NPS Reference	Section Reference
		21.7.3). **Section 21.6.1.1** and **21.6.2.2** assess the land take associated with the onshore elements of DEP and SEP.
Paragraph 5.10.8 requests that Applicant should minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification).	Paragraph 5.10.8	See **Sections 21.5.2.2** and **21.6.1.1**
Paragraph 5.10.9 request that Applicant should safeguard any mineral resources on the proposed site.	Paragraph 5.10.9	Potential impacts to mineral resources is assessed in **Chapter 19 Onshore Ground Conditions and Contamination**.
Paragraph 5.10.15 requests that applicants do not site their schemes on the best and most versatile agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land (in grades 3b, 4 and 5).	Paragraph 5.10.15	See **Sections 21.5.2.2** and **21.6.1.1**

21.4.1.2 Other

22. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of land use, agriculture and recreation.

23. The following UK legislation is considered the most relevant to land use and agriculture and recreation considered in this chapter.

- 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;
- National Planning Policy Framework (NPPF) 2018; and
- Natural Environment White Paper 2011.

24. Further detail on legislation and policy in relation to DEP and SEP is provided in **Chapter 3 Policy and Legislative Context**.

25. 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.

26. The PEIR boundary falls within the jurisdiction of Norfolk County Council and the following local authorities districts:

- Broadland District Council;
- North Norfolk District Council; and
- South Norfolk Council.

27. Local planning policy documents relevant to land use, agriculture and recreation include:

- Broadland, Norwich and South Norfolk Joint Core Strategy (2014);
- Norfolk County Council (2011) Core Strategy and Minerals and Waste Development Management Policies Development Plan Document 2010-2026;
- Broadland District Council Development Management Development Plan (2015);
- North Norfolk District Council Core Strategy 2008 – 2021; and
- South Norfolk Local Plan development management policies (2015).

28. The relevant existing documents, which contain best practise guidance on soil handling, construction management and recreational features are listed below:

- Highways Agency (2019) Design Manual for Roads and Bridges (DMRB) LA 109 (Geology and soils) and LA 112 (Population and human health).
- Highways Agency (2020) Design Manual for Roads and Bridges (DMRB) LA 112, Revision 1 (Population and human health).
- Ministry of Agriculture, Fisheries and Food (MAFF) (1988) Agricultural Land Classification of England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land (Revised Guidelines).
- Department for Environment, Food and Rural Affairs (Defra) (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites;
- MAFF (2000) Good Practice Guide for Handling Soils;
- Environment Agency (2010) Managing Invasive Non-native Plants;
- Natural England (2012) Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural land; and
- Department for Communities and Local Government (2002) Planning Policy Guidance 17: Planning for open space, sport and recreation.

21.4.2 Data and Information Sources

21.4.2.1 Site specific surveys

29. In order to provide a characterisation of the habitats and land use that are present in the direct impact study area and collect up to date information on which to base the impact assessment, a Phase 1 habitat Survey was undertaken by Wild Frontier Ecology (see **Chapter 22 Onshore Ecology and Ornithology**).

21.4.2.2 Other available sources

30. Other sources that have been used to inform the assessment are listed in **Table 21–5**.

Table 21–5: Other available data and information sources.

Data set	Source	Spatial coverage	Year	Notes
Road maps, railway lines and urban areas	ESRI ArcGIS Basemaps	Landfall, onshore cable route, onshore substation	2020	
Datasets on the structure of the agricultural industry	Defra	Norfolk	2019	
Soil types	Cranfield University	Landfall, onshore cable route, onshore project substation	2020	
The June Survey of Agricultural and Horticultural Activity.	Defra	Norfolk	2008 2013	2008 and 2013 used as this provides a detailed regional breakdown
Details of tourist activities	www.visitnorfolk.co.uk www.tournorfolk.co.uk	Norfolk	2020	
Blue flag beaches	www.visitnorfolk.co.uk	Norfolk	2020	
Details of the Broads activities	www.broads-authority.gov.uk	Norfolk	2020	

21.4.3 Impact Assessment Methodology

31. **Chapter 6 EIA Methodology** provides a summary of the general impact assessment methodology applied to DEP and SEP. The following sections confirm the methodology used to assess the potential impacts on Land use, Agriculture and Recreation.

21.4.3.1 Definitions

32. For each effect, the assessment identifies receptors sensitive to that effect and implements a systematic approach to understanding the impact pathways and the level of impacts on given receptors. The definitions of sensitivity and magnitude for the purpose of the assessment are provided in **Table 21–6** and **Table 21–7**.

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

- Recreation: The potential impacts on land users in relation to tourism and recreational receptors such as cycle routes, PRoW and national trails. Recreational assets are defined as those that are enjoyed by local users and the main tourist attractions of an area. For the purpose of this assessment, the impacts to recreational assets are considered with regards to how the impacts would change the user's experience of the asset. The socio-economic impacts upon these receptors are discussed separately in **Chapter 29 Socio-Economics and Tourism**.
- Land use: The potential impacts of the project on the continuation of the current land use (agricultural, environmental stewardship, public access, planning policy, etc).
- 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 **Chapter 19 Onshore Ground Conditions and Contamination**. **Table 21–6** 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 21–6: Definition of sensitivity for Land use, Agriculture and Recreation receptors

Sensitivity	Definition		
	Land use	**Agriculture and soils**	**Recreation**
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.		

Sensitivity	Definition		
	Land use	**Agriculture and soils**	**Recreation**
	• Planning policy areas designated at national and international scale; • Higher level environmental stewardship farms; • Future large-scale planning use applications; or • Regionally distinctive and rare land uses that cannot be replaced or adapted.	• Land at Agricultural Land Classification (ALC) Grade 1 or 2; • Land at ALC Grade 3 with respect to permanent land take; • Land with Notifiable Weeds and/or Notifiable Scheduled Diseases that are at risk of spreading; • Soil which is susceptible to structural damage and erosion; or • Unrecoverable or unadaptable soil.	• Recreational feature of national value; • National trails or paths e.g. Norfolk Coastal Path; or • European Protected Sites e.g. Norfolk Coast AONB, Norfolk Broads National Park.
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 environmental stewardship farms; or • Land used for specific and regionally important agriculture or horticulture.	• Land at ALC Grade 3 with respect to temporary land take; or • Soil which is vulnerable to seasonal structural damage or erosion.	• Recreational feature of regional value; • Blue flag beaches; • Public rights of way; (footpaths, bridleways and byways); or • Stewardship bridleways
Low	Receptor has moderate capacity to accommodate changes such as loss of recreational activity/area, loss of land area, soil degradation etc.		

Sensitivity	Definition		
	Land use	**Agriculture and soils**	**Recreation**
	• No impact on designated planning policy areas; • Not under environmental stewardship scheme, but is subject to other environmental management schemes; • Large agricultural holdings; or • Land used for ordinary agriculture or horticulture.	• Land at ALC Grade 4; • Arable or pasture grassland; or • Medium to coarse soil with some resistance to structural damage.	• Recreational feature of local value; • Local permissive pathways; • Open access land; • Local beaches; or • Local fishing and angling spaces.
Negligible	Receptor generally tolerant of changes such as loss of recreational activity/area, loss of land area, soil degradation etc.		
	• No environmental stewardship schemes or other environmental management schemes.	• Land at ALC Grade 5 or Urban; • Land which is not agricultural, arable or pasture grassland; or • Soil with a greater resistance to structural damage.	• Recreational feature with limited or no recreational value.

34. The ALC grades and descriptions following Ministry of Agriculture, Fisheries and Food (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 21–7**.

35. The ALC ranks land according to the extent to which its physical or chemical characteristics impose long-term imitations 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 above. Grade 3 land can be subdivided into 3a (good) and 3b (moderate).

36. Best and most versatile (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 by policy guidance. However, national datasets no longer subdivide Grade 3 land. For the purpose of this assessment, and taking into consideration a worst-case scenario, all Grade 3 land subject to permanent land take will be classified as BMV.

Table 21–7: 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.
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.

37. 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.

38. Impact magnitude is assessed according to the criteria defined in

39. **Table 21–**8.

Table 21–8: Definition of adverse magnitude levels for Land use, Agriculture and Recreation receptors

Magnitude	Definition		
	Land use	**Agriculture and soils**	**Recreation**
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 of >20ha of Grade 1, 2 or 3 agricultural land or >60% total regional resource (Natural England, 2012); or • Full land recovery in excess of 10 years.	• Permanent closure of a recreation feature or permanent reduction in amenity value.
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;	• Medium to long term (2 - >5 years) loss of >20ha of Grade 1 or 2 agricultural land or >60% of the regional resource; • Permanent loss of >10ha of Grade 3 agricultural land; • Full land recovery expected within 5 - 10 years;	• Temporary closure or disruption to a recreation feature or temporary reduction in amenity value (works <100m of the feature).

Magnitude	Definition		
	Land use	**Agriculture and soils**	**Recreation**
	• Existing land use would not be able to continue on <5ha of land; or • Noticeable changes to the existing land use.	• >20ha of soil is temporarily 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 (<2 years); or • Temporary change affecting usability within the site boundary; measurable permanent change with minimal effect usability, risk or value; no effect on regulatory compliance.	• Short term loss of >20ha, or permanent loss of >10ha of Grade 4 land or >10% of 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.	• Temporary reduction in amenity value of a recreation feature (works 100m - 250m of feature).
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 <1,000m^2 is permanently lost from Agriculture.	• No direct impact to feature and no amenity loss (works in excess of 250m distance separation).

21.4.3.2 Impact Significance

40. The potential significance of an impact is a function of the sensitivity of the receptor and the magnitude of the effect (see **Chapter 6 EIA Methodology** for further details). The determination of significance is down to professional judgement but may be guided by the use of an impact significance matrix, as shown in **Table 21–9**. Definitions of each level of significance are provided in **Table 21–10**.

41. Potential impacts identified within the assessment as major or moderate are regarded as significant in terms of the EIA Regulations. Appropriate mitigation has been identified, where possible, in consultation with the regulatory authorities and relevant stakeholders. The aim of mitigation measures is to avoid or reduce any significant adverse impacts upon a given receptor.

Table 21–9: Impact significance matrix

		Negative 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*	*Minor*	*Negligible*	*Negligible*	*Minor*	*Minor*	*Moderate*
	Negligible	*Minor*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Negligible*	*Minor*

Table 21–10: Definition of impact 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.

21.4.4 Cumulative Impact Assessment Methodology

42. The cumulative impact assessment (CIA) considers other plans, projects and activities that may impact cumulatively with DEP and SEP. As part of this process, the assessment considers which of the residual impacts assessed for DEP and/or SEP on their own have the potential to contribute to a cumulative impact, the data and information available to inform the cumulative assessment and the resulting confidence in any assessment that is undertaken. **Chapter 6 EIA Methodology** provides further details of the general framework and approach to the CIA.

43. For Land use, Agriculture and Recreation, 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.

21.4.5 Transboundary Impact Assessment Methodology

44. Transboundary effects relate to those that might arise within the Exclusive Economic Zone (EEZ) of European Economic Area (EEA) states or arising on the interests of EEA states.

45. For Land use, Agriculture and Recreation, there is no potential for transboundary effects and it has been scoped out of the assessment (see Planning Inspectorate 19/11/19 scoping response in **Table 21–1**).

21.4.6 Assumptions and Limitations

46. Potential impacts to assets are based on a quantitative assessment where possible, as outlined in

47. **Table 21–**8, in order to predict the effect on land use, agricultural activities and local communities, particularly during the construction phase. However, it is accepted that the perceptions, particularly so for receptor sensitivity, may differ between individuals. Therefore, the most likely perception is chosen where possible and it is assumed that differences in opinion would balance on average.

48. 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.

49. Impacts on soil resources are not predicted to extend beyond the direct study area (PEIR boundary). Therefore, any impacts to the wider area are not discussed here. The published soil data used to undertake this study only provides a general characteristic of the area and are only indicative of the soil type present. The specific characteristics may differ in the ground and can vary between individual fields.

21.5 Existing Environment

21.5.1 Land Use

21.5.1.1 Land Use and Agriculture Policies and Designations

50. A review of Broadland District Council, North Norfolk District Council and South Norfolk Council local plans 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 each of the district councils.

51. The PEIR boundary does not cross through any preferred sites allocated for housing, commercial, employment or special policy under Broadland District Council (2016), North Norfolk District Council (2011) and South Norfolk Council (2015).

52. The PEIR boundary passes through the following County Wildlife Sites presented in **Table 21–11** and presented in **Figure 21.2** and **Chapter 22 Onshore Ecology and Ornithology**.

Table 21–11: County Wildlife Sites crossed within PEIR

District Council	County Wildlife Site
Broadland District Council	Marriott's Way CWS no. 2176 Wensum Pastures at Morton Hall CWS no. 2070 Hall Hills/Ringland Covert CWS no. 2105
North Norfolk District Council	Kelling Heath Park & 100 Acre Wood CWS no. 1150 Beach Lane, Weybourne CWS no. 1156 Kelling Hard CWS no. 1107
South Norfolk Council	The Carrs Woodland CWS no. 196 Yare Valley (Marlingford Hall) CWS no. 229 Yare Valley (Colton Wood) CWS no. 228

53. The PEIR boundary overlaps with the River Wensum Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI), Weybourne Town Pit SSSI and Weybourne Cliffs SSSI.

21.5.1.2 Environmental Stewardship Schemes

54. Environmental Stewardship Schemes (ESS) allow 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). The scheme was launched in March 2005 to build on the Environmentally Sensitive Area Scheme, the Countryside Stewardship Scheme and the Organic Farming Scheme. The ESS are administered by Natural England on behalf Defra.

55. 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.

56. The location and area of the ESS agreements within the PEIR boundary are shown in **Figure 21-3** and **Table 21–12**.

Table 21–12: ESS agreements within the onshore study area

Scheme	Count	Area (Ha) of ESS within PEIR boundary	% of PIER boundary
Entry Level plus Higher Level Stewardship	19	528.09	32.48
Higher Level Stewardship	1	0.04	0.00
Organic Entry Level plus Higher Level Stewardship	1	0.59	0.04

21.5.1.3 Injurious Weeds and Invasive Species

57. Invasive non-native species represent a significant threat to native biodiversity and can lead to severe adverse environmental and economic impacts. Phase 1 Extended Habitat surveys conducted between May and September 2020 recorded Himalayan balsam *Impatiens glandulifera* (see **Chapter 22 Onshore Ecology and Ornithology** for more details).

21.5.1.4 Utilities

58. There are a number of utilities identified throughout the PEIR boundary. These include major and minor (domestic) utilities, with domestic utilities often being routed under the public highway.

59. The majority of the identified utilities crossing the PEIR boundary are for domestic services that include telecom, electricity, water, gas, sewage, unspecified pipeline and street lighting. The PEIR boundary will also cross buried high pressure gas pipelines originating from the Bacton terminal on four occasions.

60. The PEIR boundary crosses the existing Sheringham Shoal OWF underground cable and passes close to Dudgeon OWF underground cable close to the landfall at Weybourne.

61. Norfolk Vanguard / Norfolk Boreas Offshore Wind Farms and Hornsea Project Three Offshore Wind Farm underground cables run through the PEIR boundary at Cawston and Weston Longville respectively. These projects have not yet been constructed.

21.5.2 Agriculture and Soils

21.5.2.1 Agricultural Activities

62. Arable farming is common throughout Norfolk, with cereal crops dominating the farmed landscape. Farm sizes range from less than 5ha to more than 100ha (Defra, 2020). Crops grown include cereals and combinable crops (wheat, barley, and oil seed rape) and root crops (sugar beet, potatoes and field grown vegetable crops) (Defra, 2020). Soil types include clays, loam and sands.

63. Norfolk contains over 5% of the total agricultural sector in England (Norfolk Rural Development Strategy, 2013). The rural economy accounts for 44% of jobs in Norfolk, and is the largest agricultural sector of any English county based on number jobs per sector, and represents an important part of the county's economy (Norfolk Rural Development Strategy, 2013).

64. The total area of farmed land in Norfolk as of 2013 is 411,085ha (Defra, 2013). The footprint of agricultural land in the study area constitutes approximately 0.1% of the county resource.

21.5.2.2 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 21–7**.

66. The PEIR boundary primarily consists of ALC Grade 3, but ranges from Grade 2 to Grade 4 and includes some areas of Non Agricultural land (see **Figure 21.4**). The landfall at Weybourne crosses ALC Grade 3 land. The PEIR boundary does not cross any ALC Grade 1 or Grade 5 land. The onshore substation sites are located within ALC Grade 3 land.

67. The percentage of land of different ALC grades within the PEIR boundary is presented in **Table 21–13**.

Table 21–13: ALC Grades within the PEIR boundary

ALC Grade	Land comprised of ALC within PEIR boundary (Ha)	% ALC Grade land within the PEIR boundary
1	0	0
2	231	14

3 (undifferentiated)	1,283	79
4	45	3
5	0	0
Non Agricultural	71	4

21.5.2.3 Soil Type

68. The soils within PEIR boundary range from clays, loam and sands. The PEIR boundary is dominated by slightly acidic loamy soils in the north and slightly acidic sandy soils and slightly acidic loamy and clayey soils to the south. The soils around the landfall primarily consist of slightly acidic sandy soils and smaller amounts of shallow lime-rich soils. The soils around the onshore substation site options consist of slightly acidic loamy and clayey soils.

69. The soils along the PEIR boundary are predominantly of low natural fertility (without the addition of fertilisers), owing to the slightly acidic nature of the soils. Towards the south of the study area, the soils have moderate to high fertility (see **Figure 21.5**).

70. Field drainage systems, in conjunction with and situated alongside buried drains, are a vital part of agriculture in Norfolk in order to maintain the productivity of the soil.

71. **Table 21–14** provides additional detail on the characteristics of the soil types found within the study area (Cranfield University, 2020).

Table 21–14: Soil types within the PEIR boundary

Soil Characteristics	Soil Description
Freely draining slightly acidic sandy soils	
Texture	Sandy
Drainage	Freely draining
Natural Fertility	Low
Typical Habitats	Acid dry pastures; acid deciduous and coniferous woodland; potential for lowland heath
Landcover	Arable
General cropping	Suitable for wide range of spring and autumn sown crops including irrigated roots, potatoes and field vegetables; lime and fertiliser rapidly leached; shortage of soil moisture will limit yield without irrigation
% of the PEIR boundary	27.84
Shallow lime-rich soils over chalk or limestone	
Texture	Loamy

Soil Characteristics	Soil Description
Drainage	Freely draining
Natural Fertility	Lime-rich
Typical Habitats	Herb-rich downland and limestone pastures; limestone pavements in the uplands; Beech hangers and other lime-rich woodlands
Landcover	Arable and grassland
General cropping	Over chalk, spring and autumn cereals can be grown but the soils are especially vulnerable to nitrate leaching and attract stricter fertiliser limits. Suitable only for grassland where there is hard limestone. Lack of soil moisture is most likely limiting factor to yields
% of the PEIR boundary	4.61
Freely draining slightly acid loamy soils	
Texture	Loamy
Drainage	Freely draining
Natural Fertility	Low
Typical Habitats	Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands
Landcover	Arable and grassland
General cropping	Suitable for range of spring and autumn sown crops; under grass the soils have a long grazing season. Free drainage reduces the risk of soil damage from grazing animals or farm machinery. Shortage of soil moisture most likely limiting factor on yields, particularly where stony or shallow
% of the PEIR boundary	28.02
Loamy and sandy soils with naturally high groundwater and a peaty surface	
Texture	Peaty
Drainage	Naturally wet
Natural Fertility	Low to High
Typical Habitats	Wet meadows
Landcover	Mostly arable

Soil Characteristics	Soil Description
General cropping	Cereals, roots, potatoes and field vegetables provided groundwater is controlled. Ease of working and winter harvesting, which can be damaging to structure, dependent on texture and drainage of subsoil.
% of the PEIR boundary	3.28
Fen peat soils	
Texture	Peaty
Drainage	Naturally wet
Natural Fertility	Mixed, very low to lime-rich
Typical Habitats	Wet fen and carr woodlands
Landcover	Arable and horticulture
General cropping	Once drained, soils are suitable for arable and horticultural cropping but cultivation leads to gradual loss of the peat through wind erosion and oxidation.
% of the PEIR boundary	0.97
Slightly acid loamy and clayey soils with impeded drainage	
Texture	Loamy, some clay
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
% of the PEIR boundary	26.81
Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils	
Texture	Loamy and clayey
Drainage	Impeded drainage
Natural Fertility	Moderate

Soil Characteristics	Soil Description
Typical Habitats	Seasonally wet pastures and woodlands
Landcover	Grassland and arable, some woodland
General cropping	Mostly suited to grass production for dairying 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.
% of the PEIR boundary	8.40

21.5.3 Recreation and Tourism

21.5.3.1 Tourism in Norfolk

72. East Anglia has a rich and diverse tourism offer, including the Broads and the heritage coast with its traditional seaside resorts such as Great Yarmouth and Sheringham. Norfolk is an attractive rural and coastal area which supports a thriving tourism industry and provides a valuable leisure and recreation resource for residents and visitors alike (please see **Appendix 29.2 Socio-Economics and Tourism Technical Baseline** for more information on Tourism).

73. The Norfolk coast is characterised by a number of attractive seaside towns, with fine beaches and many tourist attractions. Further inland, Norfolk is home to a number of unique natural assets, attracting activities such as cycling, walking and heritage tourism.

74. Norfolk has a rural character punctuated by market towns and villages. The coastline has long sandy beaches and quaint coastal towns. Visitor surveys show that the majority of visitors travel from within the UK and come to enjoy the countryside (Visit Norfolk, 2019). Norfolk is situated within reasonable distance of major urban centres such as Peterborough, Cambridge, Milton Keynes, and London.

75. Tourism data on volume and value shows that in 2018 there were 50.9 million visits to Norfolk, injecting around £2.37 billion of visitor expenditure into the local economy. The majority of trips to Norfolk (i.e. 47.8 million or 94%) are day visits, injecting around £1.59 billion into the local economy. Whilst overnight visits represent only 6% of total visits to Norfolk, in 2018 these led to an overall injection of £740 million (or around 31% of total visitor expenditure).

76. Visit Norfolk's 2019 Perceptions Study (Visit Norfolk, 2019) indicates the following points about Norfolk:

- With regards to towns or cities, visitors are most likely to visit Norwich, Great Yarmouth, and then Cromer;
- The Broads stands out as a particularly popular area; and
- The natural environment appears to be the most 'visited' amenity in Norfolk with the coastal beaches and countryside the most popular.

77. Tourism is the largest industry sector in Norfolk and it is tourists' perception that activities such as walking, using the beach, or enjoying the scenery have the greatest appeal. Therefore, tourism assets relating to outdoor activities can be considered more sensitive than those relating to indoor activities.

21.5.3.2 Onshore Tourism and Recreational Assets

78. The PEIR boundary crosses a number of beaches, coastal towns, paths, long distance trails and PRoW.

21.5.3.2.1 Coastline

79. Coastlines within the study area boast historic villages, seaside resort villages and outstanding coastal countryside.

80. The Norfolk Coast Area of Outstanding Natural Beauty (AONB) is an area designated by Natural England for conservation due to its significant landscape value. It stretches 56 miles and covers over 450km^2 of coastal and agricultural land. The Peddars Way and the Norfolk Coast path National Trail both pass through the AONB. The coast hosts many activities and attractions for visitors including: walking, cycling, birdwatching, history and heritage, nature reserves and stargazing. The landfall area is located within the AONB.

21.5.3.2.2 Beaches

81. The north Norfolk coastline contains six Blue Flag beaches, including Sheringham Beach which is situated 2km east of the Landfall. The beaches at West Runton and East Runton also have Blue Flag status and are situated 5.5km and 7km from the landfall respectively. These three beaches are also designated bathing beaches, all of which have been classified as excellent (Environment Agency, 2020).

21.5.3.2.3 Landfall

82. The key recreational features (see **Figure 21.6**) of the landfall area surrounding Weybourne are highlighted below:

- Weybourne Beach is accessible via the public car park and consists of steeply shelving pebbles. The beach and coastal paths are popular with walkers and dog walkers. The beach provides the starting point for the deep history coast discovery trail. The quickly deepening waters mean it is not a good location for swimming. The wreck between Kelling and Weybourne is a popular angling location.
- The Peddars Way and Norfolk Coast Path run parallel to the beach at Weybourne.
- The Muckleburgh Military Collection museum, containing military vehicles and weapons, alongside a café and play area, is located 250m south of the beach.
- Weybourne contains a pub, Café, tearoom, village store and numerous holiday cottages and hotels. Foxhills campsite is located directly west of the village.
- The North Norfolk Railway Poppy line is a heritage steam railway that operates between Sheringham and Holt, and passes south of Weybourne. The railway provides good access to the 100 acre woods.

- Muckleburgh Hill is a publicly accessible county wildlife site, composed of 21 hectares of remnant heathland falling within the North Norfolk AONB. The site provides grassland and semi-natural woodland mosaic.

21.5.3.2.4 The Norfolk Broads National Park

83. The Norfolk Broads National Park is Britain's largest protected wetland and an important tourist attraction for activities such as wildlife spotting, boating and scenic walks. The Norfolk Broads National Park is located over 5.5km from the PEIR boundary and onshore substation site options and therefore direct impacts upon the Broads will be avoided. However, the PEIR boundary crosses several rivers that flow towards the Broads. These are detailed in **Chapter 20 Water Resources and Flood Risk.**

21.5.3.2.5 National trails

84. The Norfolk Coastline contains two long distance National Trails; the Peddars Way and Norfolk Coast Path, and the Sea Palling to Weybourne stretch of the England Coastal Path. The Norfolk Coast Path is crossed by the PEIR boundary at the landfall. The path runs for approximately 135km along the Norfolk coast from Hunstanton in west Norfolk round to Sea Palling on the north Norfolk coast and is split into a series of circular walks, short linear walks and long linear walks. The Peddars Way starts in Suffolk and joins with the Norfolk Coast Path at Holme-next-the-Sea.

85. The Sea Palling to Weybourne section of the England Coast Path runs adjacent to the Peddars Way and Norfolk Coast Path and is also crossed by the PEIR boundary at the landfall

21.5.3.2.6 Public Rights of Way

86. The PEIR boundary will cross numerous PRoWs including bridleways, footpaths and byways. Details of these crossings are provided in **Table 21–15** and shown on **Figure 21.7** to **Figure 21.12**.

Table 21–15: PRoW that interact with the PEIR boundary

PRoW Type	No. of times crossed
Footpath	36
Bridleway	6
Open Byway	1
Restricted Byway	2

87. Notable PRoWs include the Marriott's Way which is footpath and cycle route that runs between Aylsham and Norwich.

21.5.3.2.7 Cycle Routes

88. The PEIR boundary crosses SUSTRANS Regional Cycle Route 30 and SUSTRANS National Cycle Network Route 1. The Norfolk Coast Cycleway uses the Regional Cycle Route 30 south of Weybourne. Similarly, the Regional Cycle Route 1 utilises the Marriott's Way between Reepham and Norwich. Details of these crossings are provided in **Table 21–15** and shown on **Figure 21.7** to **Figure 21.12**.

21.5.3.2.8 Open access and common land

89. 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.

90. There is one area of open access land within the PEIR boundary:

- Gravel pit, south of Weybourne station with an area of 0.1ha.

21.5.3.2.9 Dark sky areas

91. The International Dark Sky Association officially recognises 12 Dark Sky Places in the UK, none of which are located in Norfolk. However, the Dark Sky Discovery Partnership also lists a significant number of sites across the UK, of which five are located in Norfolk (Dark Sky Discovery, 2020). Details of each site and their proximity to the PEIR boundary are provided in **Table 21–16**.

Table 21–16: Dark Sky Discovery Partnership sites within Norfolk

Site name	Classification	Events	Proximity to PEIR boundary (km)
Kelling Heath Holiday Park – Sports Field	Milky Way Plus Events	Well known and popular twice yearly star parties	1
Wiveton Downs SSSI	Milky Way Plus Events	None currently	6.75
Barrow Common	Milky Way Plus Events	Local astronomy groups run sessions for their members and the public.	30
RSPB Titchwell Marsh Nature Reserve	Milky Way Plus Events	Local astronomy groups run occasional public events in collaboration with the RSPB.	34.75
Great Ellingham Recreational Ground	Milky Way Plus Events	BBC Star gazing and other open evenings.	12.8

21.5.4 Climate Change and Natural Trends

92. The erosion of soil is a natural process that is expected to occur over time and is primarily controlled by the weather conditions and farming practices. Climate change has the potential to exacerbate weather conditions, which could lead to greater rates of erosion in the future. Norfolk is aiming to position itself as a world class research base for innovative agricultural technology, which has the potential to develop improvements in water, energy and nutrient supply. As a result, it is hoped that food productivity will be increased and the issues and opportunities outlined by Norfolk's Rural Development Strategy, (e.g. resource pressure, climate change, an ageing and wealthier population and advances in industry and communications) would be addressed. The overall aim of the Strategy is to develop the economy whilst strengthening the relationship between rural and urban areas in a sustainable way, promoting green infrastructure and the protection of biodiversity.

93. However, this could lead to a decline in the quality and availability of agricultural land over time, with some potential offsets by advances in agricultural innovations and technology.

94. The majority of tourism/recreation demand is from UK visitors on day trips or short overnight trips. Demand is seasonal and weather dependent, especially for visitors that are close enough to make a day trip. Therefore, it is unlikely that this seasonal relationship will change significantly.

21.6 Potential Impacts

21.6.1 Potential Impacts during Construction

21.6.1.1 Impact 1: Agricultural Drainage

95. There is the potential for the groundworks associated with the onshore export cable installation and onshore substation construction to impact the natural and artificial field drainage systems. 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 **Chapter 20 Water Resources and Flood Risk.**

96. 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 along the PEIR boundary and at the landfall are mostly freely draining acidic, loamy and clayey soils.

97. At the onshore substation any existing field drainage would be permanently taken out of use during construction within the operational footprint of the substation.

21.6.1.1.1 Receptor Sensitivity

98. Field drainage networks have a limited capacity to accommodate changes such as degradation or poor reinstatement. Therefore, they are considered to have a medium sensitivity overall.

21.6.1.1.2 Magnitude of effect

21.6.1.1.2.1 DEP or SEP in Isolation

99. Without mitigation, the magnitude of the effect is considered to be medium for either DEP or SEP in isolation, due to >20ha of soil and associated drainage being temporarily unsuitable in the short term (less than five years) for agriculture, as land drains will only potentially be disrupted during the installation of the onshore export cable corridor and onshore substation earthworks in a single operation. The installation of the onshore export cable is expected to take up to 24 months in total.

100. Construction may be carried out by up to ten teams (one per 1km section) along the export cable corridor at the same time. Each team typically working on a 400m length of the corridor on any given day, and within that length the extent of open trenches would typically be between 50-100m on any given day, with the trench being excavated at one end and backfilled at the other as works progress along that section.

101. Without mitigation, the magnitude of the effect is considered to be medium due to >20ha and associated drainage being temporarily unsuitable in the short term (less than five years) for agriculture.

21.6.1.1.2.2 DEP and SEP Together

102. A scenario where the DEP and SEP are developed sequentially would represent the worst case scenario for the impacts to drainage. Land drains would potentially be disrupted twice during the two installations of the onshore cable corridor and onshore substation. The installation of the onshore export cable is expected to take up to 24 months in total (concurrent scenarios); or two separate periods of 24 months for the sequential scenario).

103. Construction may be carried out by up to ten teams (one per 1km section) along the export cable corridor at the same time. Each team typically working on a 400m length of the corridor on any given day, and within that length the extent of open trenches would typically be between 50-100m on any given day, with the trench being excavated at one end and backfilled at the other as works progress along that section.

104. Without mitigation, the magnitude of the effect is considered to be medium due to >20ha and associated drainage being temporarily unsuitable in the short term (less than five years) for agriculture.

21.6.1.1.3 Impact Significance

21.6.1.1.3.1 DEP or SEP in Isolation

105. The medium magnitude effects, on a medium sensitivity receptor represents an impact of moderate adverse significance.

21.6.1.1.3.2 DEP and SEP Together

106. The medium magnitude effects, on a medium sensitivity receptor represents an impact of moderate adverse significance.

21.6.1.1.4 Mitigation Measures

107. The Applicant will appoint Agricultural Liaison Officer (ALO) and land drainage consultant to develop pre-and post-construction drainage plans. Additionally, land drainage systems will be maintained during construction and land and land drainage would be reinstated following completion of construction works during reinstatement phase.

21.6.1.1.5 Residual Impact

21.6.1.1.5.1 DEP or SEP in Isolation

108. Introducing construction drainage during the works and reinstating land drainage as soon as reasonably possible following the completion of the works reduces both the duration soil is unavailable and the amount of soil affected by poor drainage, thereby reducing the effect to one of low magnitude. Taking this into account, for a receptor of medium sensitivity, a residual impact of **minor** adverse significance is expected.

21.6.1.1.5.2 DEP and SEP Together

109. Introducing land drainage during the works and reinstating land drainage as soon as reasonably possible following the completion of the works in this scenario reduces both the duration soil is unavailable and the amount of soil affected by poor drainage in the same way as set out in the single projectscenario, representing a residual impact of **minor** adverse significance.

21.6.1.2 Impact 2: Temporary Loss of Land for Agriculture

110. Construction activities have the potential to either directly take land out of existing use or isolate land which would effectively take it out of use. This would also result in loss of a growing season in the area affected and the loss of associated income.

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

112. The majority of the construction footprint would be within areas currently associated with agricultural production. The footprint of the mobilisation areas, onshore cable corridor (trenching, haul road, soil storage) and joint pits would all contribute to the temporary loss of land for agriculture, as well as the temporary compounds associated with HDD.

113. Considering access to individual fields would be determined during construction planning (post consent), it is not possible to calculate the exact area of land that would be isolated or inaccessible.

21.6.1.2.1 Receptor Sensitivity

114. The quality of the land varies from ALC grades 2 – 4, however the majority of the land area is ALC grade 3 that is subject to temporary land take. Therefore, the sensitivity of the receptor, in accordance with **Table 21–6**, is considered to be medium.

21.6.1.2.2 Magnitude of effect

21.6.1.2.2.1 DEP or SEP in Isolation

115. Based on the worst case parameters set out in **Table 21–2**, the total construction footprint within agricultural land would be > 20ha for 24 months for either DEP or SEP. Therefore, the magnitude of effect is considered to be medium.

21.6.1.2.2.2 DEP and SEP Together

116. A scenario where the DEP and SEP are developed sequentially would represent the worst case scenario for the impacts to land use. Based on the worst case parameters set out in **Table 21–2**, the total construction footprint within agricultural land would be > 20ha for two separate periods of 24 months..

117. This is a result of the construction activities taking place over two operations in a sequential scenario. Furthermore, multiple operations could expose the soil for a greater amount of time and increase the likelihood of degradation and poor reinstatement.

118. Based on the length of construction and the temporary nature of the effect (not extending past construction), with > 20ha of land unsuitable for agriculture; the magnitude of effect is considered to be medium.

21.6.1.2.3 Impact Significance

21.6.1.2.3.1 DEP or SEP all scenarios

119. Without mitigation, the greatest effect arising from either construction scenario is medium magnitude, on a medium sensitivity receptor, resulting in an impact of moderate adverse significance.

21.6.1.2.4 Mitigation Measures

120. Wherever practicable, access to severed land for farm vehicles will be maintained, subject to individual agreements with landowners and occupiers. Where necessary, crossing points would be agreed pre-construction.

121. In order to reduce conflicts, appropriate planning and timings of works will be discussed with landowners and occupiers.

122. Private agreements (or compensation in line with the compulsory purchase compensation code) will be sought with relevant landowners/occupiers and the land will be reinstated to preconstruction condition.

21.6.1.2.5 Residual Impact

21.6.1.2.5.1 DEP or SEP all scenarios

123. By consulting with landowners, maintaining access to severed land, appropriate timings of works and reinstating land to the pre-construction conditions as soon as reasonably practicable, it is likely that the amount of land temporarily unsuitable for agriculture is significantly reduced.

124. However, the amount of land affected would be > 20ha in all construction scenarios and therefore a medium magnitude effect would still be expected with mitigation in place. s a result, the residual impact would remain at **moderate** adverse significance.

21.6.1.3 Impact 3: Soil degradation

125. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works including temporary compound locations, particularly 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 **Chapter 20 Water Resources and Flood Risk**). 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 in the future.

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

127. The following activities proposed during the onshore construction works 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 mobilisation areas and stockpiling and reinstatement of soil.

21.6.1.3.1 Receptor Sensitivity

128. The soils in the study area are in general loamy and clayey and, therefore susceptible to compaction. They are also difficult to handle during wet periods using machinery without causing structural degradation. Given these characteristics, the soil resource at the site is conservatively considered to be of medium sensitivity with respect to potential for degradation during the construction period.

21.6.1.3.2 Magnitude of effect

21.6.1.3.2.1 DEP or SEP in Isolation

129. Soil within the construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles. The magnitude of this potential effect is considered to be medium.

21.6.1.3.2.2 DEP and SEP Together

130. A scenario where the DEP and SEP are developed sequentially would represent the worst case scenario for potential soil degradation. A sequential scenario would require a greater volume of material to be excavated, increasing the amount of topsoil and subsoil to be stored and reinstated. Additionally, with construction activities taking place over two phases, the amount of time construction traffic, heavy machinery and heavy materials spend on the site and on the haul road would be increased.

131. Soil within the construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles. However, the magnitude of this potential effect is no greater than for either DEP or SEP in isolation, i.e. medium.

21.6.1.3.3 Impact Significance

21.6.1.3.3.1 DEP or SEP all scenarios

132. Without mitigation, the greatest effect arising from all construction scenarios is medium magnitude, on a medium sensitivity receptor, representing an impact of moderate adverse significance.

21.6.1.3.4 Mitigation Measures

133. Mitigation measures to further reduce the effect of the construction activities include developing a Soil Management Plan (SMP) which will set out procedures for the appropriate handling of soils during the 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.
- 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.

21.6.1.3.5 Residual Impact

21.6.1.3.5.1 DEP or SEP all scenarios

134. Impacts on the soil resource would be minimised through the mitigation measures outlined above. For example, reducing the footprint of the works and limiting the exposure time would likely reduce the magnitude of the effect to low.

135. A low magnitude effect, on a medium sensitivity receptor, reduces the residual impact to **minor** adverse significance.

21.6.1.4 Impact 4: Loss of Soil to Erosion

136. 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.

21.6.1.4.1 Receptor Sensitivity

137. The construction footprint is dominated by loamy and clayey soils, which have a relatively cohesive nature. Therefore, it is considered that the soils would have low vulnerability to erosion and subsequentially, the sensitivity of the soils to erosion is considered to be low.

21.6.1.4.2 Magnitude of effect

21.6.1.4.2.1 DEP or SEP all scenarios

138. All construction scenarios would require earthworks over a substantial area. However, it is not expected that >20ha of soil will be lost to erosion as a result of the construction works in any of the scenarios. However, without mitigation these earthworks could potentially lead to some soil erosion considered to be <20ha across construction areas, representing a low magnitude of effect.

21.6.1.4.3 Impact Significance

21.6.1.4.3.1 DEP or SEP all scenarios

139. Prior to mitigation, the greatest magnitude arising from either construction scenario is low magnitude, on a low sensitivity receptor, resulting in an impact of minor adverse significance.

21.6.1.4.4 Mitigation Measures

140. Measures set out in 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, 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;
- Employ reinstatement 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.

21.6.1.4.5 Residual Impact all scenarios

141. Additional mitigation is expected to reduce the amount of material permanently and reduce the magnitude of effect to negligible for both SEP in Isolation and DEP and SEP Together scenario. A negligible magnitude, on a low sensitivity receptor, results in a residual impact of **negligible** significance.

21.6.1.5 Impact 5: Impact to Environmental Stewardship (ESSs)

142. Two potential connected impacts are anticipated as a result of construction:

- Ecological – in terms of the loss of the agreements and the substantive agri-environmental objectives of the scheme (for example loss of field margins); and
- Financial – in terms of the loss of the agreements and the impact on overall farming income.

143. The study area for both DEP and SEP (i.e. the PEIR boundary) interacts with 19 different ESS classified at Entry Level plus Higher Level Stewardship, which represents 32% of the study area. Organic Entry Level Plus higher Level Stewardship make up 0.04% of the study area.

144. The effect on landowners / occupiers with ESS agreements in place will depend on the extent and duration of construction works within land parcels managed under an ESS, and the terms and conditions attached to the agreement in place. Refinement of the PEIR boundary (most notably the onshore cable corridor) will take into consideration land parcels managed under ESS agreements, with a view to avoid these land parcels where possible. Landowner engagement will form a key part of the DCO boundary refinement, during which information relating to the location, extent and content of ESS agreements will be gathered and fed back into the refinement process for DEP and SEP. This includes gathering information from landowners on any ecological constraints or opportunities associated with existing ESSs.

145. In some instances it may not be possible to avoid land managed under an ESS, resulting in a landowner / occupier being unable to meet the terms of an agreement. The level 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. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.

146. As noted above, the primary mitigation relating to ESSs will be the avoidance of land parcels that are subject to agreements, where possible. However, where impacts to an agreement cannot be avoided (for example the onshore substation), these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate. In general, it is considered that ecological losses associated with impacts to ESSs will be mitigated through the types of mitigation set out in **Chapter 22 Onshore Ecology and Ornithology.**

21.6.1.6 Impact 6: Utilities

147. The majority of the identified utilities crossing the PEIR boundary are for domestic services that include telecom, electricity, water, gas, sewage, unspecified pipeline and street lighting. The PEIR boundary will also cross buried high pressure gas pipelines originating from the Bacton terminal on four occasions (please see **Appendix 5.1 Crossing Schedule**).

148. The PEIR boundary crosses the existing Sheringham Shoal OWF underground cable and passes close to Dudgeon OWF underground cables close to the landfall at Weybourne. The PEIR boundary also crosses the Norfolk Vanguard / Norfolk Boreas Offshore Wind Farm underground cables and Hornsea Project Three Offshore Wind Farm underground cables at Cawston and Weston Longville respectively, although these schemes have yet to be constructed.

149. DEP and SEP will undertake utility crossings in accordance with industry standard practice as agreed with the utility owners.

150. The PEIR boundary had been selected to avoid major utilities where possible/practicable. Therefore, **no impacts** associated with existing utilities are anticipated during construction both for DEP and SEP in Isolation and DEP and SEP Together.

21.6.1.7 Impact 7: Deterioration of Blue Flag Beaches

151. There are three Designated Bathing Waters and Blue Flag Beaches within 10km of the PEIR boundary the nearest being Sheringham Beach 2km east of the PEIR boundary. There is the potential that offshore construction activities associated with the landfall (for example cable pulling) and nearshore works could lead to localised increases in suspended sediment concentration which may in turn affect water quality at the nearest beaches.

152. Whilst compliance with the Bathing Waters Directive is not dependent on suspended sediment concentrations, the presence of a plume during the bathing season would be undesirable.

153. Any suspended sediment plumes arising would be localised to within approximately 1km of the release location (please see **Chapter 10 Marine Geology, Oceanography and Physical Processes**). This would not be expected to be visible from the nearest Blue Flag beach (Sheringham Beach), which is located 2km east of the landfall. Due to the limited temporal and spatial extent of sediment plumes combined with the temporary nature of the work and the distance from designated beaches, it is considered unlikely that tourists or recreational users would perceive a change in bathing water quality. Therefore, there is considered to be **no impact.**.

21.6.1.8 Impact 8: Disruption to onshore coastal recreational assets

154. The beach at Weybourne is primarily used for local recreational purposes. It is considered that access to the beach is an important element of local residents' quality of life.

21.6.1.8.1 Receptor Sensitivity

155. The beach at Weybourne represents a recreational feature of local value and is therefore considered to have low sensitivity.

21.6.1.8.2 Magnitude of effect all scenarios

156. The HDD works should not require any prolonged periods of restrictions or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access (see **Chapter 5 Project Description** for details). For example, use of a temporary seawater pipe and pump to supply seawater to the onshore HDD temporary works compound for use with the drilling fluid, as well as the use of vehicles to transport the ducting across the beach. For the DEP and SEP sequential scenario the temporary impact on beach access would occur during each phase. However, as closure at any one time will not exceed two weeks, the impact magnitude is considered to be negligible for all scenarios.

21.6.1.8.3 Impact Significance all scenarios

157. For all construction scenarios the greatest effect is of negligible magnitude, on a low sensitivity receptor, representing an impact of **negligible** significance.

21.6.1.8.4 Mitigation Measures

158. Any areas subject to short-term restricted access would be agreed in advance with the Countryside Access Officer at Norfolk County Council prior to construction.

21.6.1.8.5 Residual Impact

159. For all construction scenarios **no residual impact** is anticipated. .

21.6.1.9 Impact 9: Disruption to users of inland recreational assets

160. The countryside of Norfolk is well regarded by local recreational users and is an intrinsic aspect of the visitor's experience. The site selection process has limited impacts on recreational assets which are described in **Section 21.5.3.2.** Recreational routes have been assessed separately in the following section. The Norfolk Coast AONB is a significant inland tourism asset and will be directly affected by the construction works as the landfall is located within the designation.

161. Potential impacts on inland assets could arise from the physical presence of construction works or disturbance impacts from noise or lighting, which could lead to a reduction in the recreational value of the asset..

162. As described in **Chapter 29 Socio-Economics and Tourism**, the Norfolk tourism sector is growing with visitors coming to enjoy natural assets such as the North Norfolk Coast AONB beaches, footpaths and the rural character of the area.

21.6.1.9.1 Receptor Sensitivity

163. Recreational assets in the vicinity of the onshore works are considered to be of national value, which equates to a high sensitivity receptor.

21.6.1.9.2 Magnitude of effect all scenarios

164. For all construction scenarios the impacts are considered to be the same, r.

165. Due to the limited and often temporary reduction in the amenity value of a small number of recreational assets in the vicinity of onshore works, the magnitude of effect is assessed to be low.

21.6.1.9.3 Impact Significance all scenarios

166. For all construction scenarios the greatest magnitude arising is low magnitude, on a high sensitivity receptor, resulting in an impact of **moderate** adverse significance.

21.6.1.9.4 Mitigation Measures

Where significant visual and noise impacts are identified in proximity to recreational assets, appropriate mitigation will be identified and implemented as set out in **Chapter 25 Noise and Vibration** and **Chapter 28 Landscape and Visual Impact**, to reduce potential impacts down to non-significant. These measures will be secured within a OCoCP and Outline Landscape and Ecological Management Strategy (OLEMS) submitted with the DCO application.

21.6.1.9.5 Residual Impact

167. For all construction scenarios the implementation of required noise and / or visual mitigation would reduce the magnitude of impact on any affected recreational assets from low to negligible and reduce the residual impact significance to **minor** adverse.

21.6.1.10 Impact 10: Disruption to users of Recreational Routes

168. The PEIR boundary crosses numerous recreational routes such as PRoWs (including bridleways, footpaths and byways), National Trails, and cycle paths, as shown on **Figure 21-7** to **Figure 21.12**.The PEIR boundary interacts with a total of 45 PRoWs (as listed in **Table 21–15**) including key routes such as the Marriott's Way.

169. Potential interactions with recreational routes are limited to the onshore cable corridor and onshore substation. The HDD works at the landfall should not require any prolonged periods of restrictions or closures to the beach for public access, although it is possible that some work activities will be required to be performed on the beach that may require short periods of restricted access (not longer than two weeks).

21.6.1.10.1 Receptor Sensitivity

170. PRoWs are considered to be regionally important receptors and are assessed as medium sensitivity, whereas National Trails are considered to be nationally important receptors and are assessed as high sensitivity. Similarly, regional cycle routes are assessed as medium sensitivity, whereas national cycle routes are assessed as high sensitivity. Other paths not classified above are considered to be of local importance and as such are assessed to be low sensitivity receptors.

Table 21–17: High sensitivity PRoW, National Trails and cycleways within PEIR boundary

PRoW, Path or non-motorised route	Classification	Type of Crossing	Impact Magnitude
Peddars Way and Norfolk Coast Path	National Trail	Crossed at landfall via HDD trenchless crossing	Negligible
Sea Palling to Weybourne	England Coastal Path	Crossed at landfall via HDD trenchless crossing	Negligible
Norfolk Coast Cycleway / Regional Cycle route 30	SUSTRANS Regional Route	CX010 (Minor Road, Open cut)	Negligible
Marriott's Way / SUSTRANS National Cycle Network route 1	SUSTRANS National Route	CX073 (PRoW/Cycleway, Open cut)	Negligible
Cross-Norfolk Trail / Marriott's Way	Long Distance Walking Route	CX073 (PRoW/Cycleway, Open cut)	Negligible

21.6.1.10.2 Magnitude of effect

21.6.1.10.2.1 DEP or SEP in Isolation

171. The installation of onshore cable corridor (please see **Chapter 5 Project Description**) will be carried out in sections with typical section length around 1km with multiple construction teams working on different areas and footpaths will be crossed by open trench crossing.

172. It is intended that PRoWs,, National Trails, and cycle paths, will be kept open and there will be no permanent closures of recreational routes Closures would therefore be temporary. It is concluded that the likely overall effect is of medium magnitude.

21.6.1.10.2.2 DEP and SEP Together

173. The DEP and SEP built sequentially would present the worst case scenario for this impact. This is because a sequential scenario would require a longer duration of temporary closures (i.e. closure for each project). Although the temporary closures duration might be longer under this scenario it is concluded that the likely overall effect is still of medium magnitude.

21.6.1.10.3 Impact Significance

174. For both DEP or SEP in Isolation and DEP and SEP Together the greatest magnitude arising from DEP and SEP is medium magnitude, on a high sensitivity receptor, representing an impact of major adverse significance.

21.6.1.10.4 Mitigation Measures

175. A pre- and post-construction survey of affected recreational routes affected will be undertaken. A suitably qualified ALO will be employed to ensure that information on existing land conditions is obtained, recorded and verified during the rights of way surveys.

176. Where impacted by the works, the surveyed recreational route will be restored to its original condition or otherwise as agreed with the relevant authority. The ALO will act as the point of contact for the restoration of the route.

177. If any temporary diversions are required during construction these will be agreed in advance with the Countryside Access Officer at Norfolk County Council Norfolk County Council, and will include sign posting and dissemination of information to the public to minimise possible impacts to an acceptable level.

178. In the case of the recreational routes that run parallel to the onshore cable corridor at discreet sections, safe access to the routes will be maintained along the side of the section with safety fencing between the works area and the pedestrian route.

21.6.1.10.5 Residual Impact

179. For all construction scenarios, following the implementation of measures the impacts on the recreational routes, will be reduced to negligible magnitude, which for a receptor of medium sensitivity, represents a residual impact of **minor** adverse significance.

21.6.1.11 Impact 11: Disruption to open access or public land

180. A small area (0.1ha) of open access land or common land has been identified within the PEIR boundary (gravel pit south of Weybourne station). The area forms part of a dispersed group of earthwork pits, interpreted as iron procurement pits dating from the Late Saxon to medieval period.

21.6.1.11.1 Receptor Sensitivity

181. **Table 21–6** outlines that open access land is considered to be a low sensitivity receptor and of local value.

21.6.1.11.2 Magnitude of effect

21.6.1.11.2.1 DEP and SEP in Isolation

182. The installation of onshore export cables (please see **Chapter 5 Project Description**) will be carried out in sections with typical section length around 1km with multiple construction teams working on different.

183. If the impact on common land cannot be avoided by refinement of the onshore cable corridor, a temporary closure would be necessary, which would represent effect of medium magnitude.

21.6.1.11.2.2 DEP and SEP Together

184. The impacts of DEP and SEP sequentially are considered the worst case section as any temporary closure would be longer in total than under concurrent scenario. However, the overall effect would still remain of medium magnitude.

21.6.1.11.3 Impact Significance all scenarios

185. For all construction scenarios the magnitude of effect associated with the construction of the scenario is medium, on a low sensitivity receptor, representing in an impact of **minor** adverse significance.

21.6.1.11.4 Mitigation Measures

186. The typically 200m wide onshore cable corridor presented as the PEIR boundary will be refined down to typically 60m wide onshore cable corridor for the DCO application, increasing to 100m wide at trenchless crossings. As part of this refinement process consideration will be given to the gravel pit south of Weybourne station, which will be avoided if possible. Temporary construction compounds will also be sited outside of this area where practicable.

21.6.1.11.5 Residual Impact

21.6.1.11.5.1 DEP or SEP all scenarios

187. By taking all measures reasonably possible to avoid open access land, the effect would be reduced to no effect. As a result, there would be no residual impact.

21.6.2 Potential Impacts during Operation

21.6.2.1 Impact 1: Disruption to Field Drainage

188. DEP and SEP 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, ordinary watercourses and IDB maintained watercourses, especially along the onshore cable corridor.

189. Permanent above ground infrastructure and hardstanding at the substation, as well as presence of buried cables has the potential to affect the field / land drainage during operation (see **Chapter 20 Water Resource and Flood Risk** for further detail).

21.6.2.1.1 Receptor Sensitivity

190. Field drainage networks are considered to have a medium sensitivity overall.

21.6.2.1.2 Magnitude of effect all scenarios

191. Field drainage along the cable corridor will be reinstated to ensure that maintain the level of field drainage that was in place pre-construction. As such there would be no impact on surface water drainage during operation. Furthermore, all temporary logistics compounds and temporary access tracks will be fully reinstated and would have no operational use.

192. The backfilling of material, within both construction drainage channels and along the onshore cable corridor itself will prevent a conduit from forming and ensure there are no changes to the local flow rates due to permeability changes.

193. Whilst there will be a permanent change to the field drainage at the substation site during operation, this will be compliant with the Flood Risk Assessment (FRA) as presented in **Appendix 20.2** and will ensure that any water discharged from the substation into the surrounding drainage network would be at the existing greenfield runoff rate.

194. Given that all drainage would be reinstated and drainage requirements at the onshore substation would be compliant with any flood risk assessment, it is considered that there would be **no impact** upon field drainage during operation.

21.6.2.2 Impact 2: Permanent Loss of Land for Agriculture

195. The onshore export cables will be buried to a depth of at least 1.2m and normal agricultural activities will be able to continue following completion of the construction works.

196. Joint bays would be required along the route of the onshore export cables to connect sections of cable. Routine maintenance is anticipated as consisting of one annual visit to each jointing bay to carry out routine integrity tests, which would typically be accessed via man-hole covers and possible non-intrusive checking of the cable in between jointing bays with, for instance, ground penetrating radar.

197. Link boxes will also be present above ground for routine maintenance along the cable corridor (link boxes would be present approximately every 500m along the cable route). These may be above ground structure up to 1.5m tall with a footprint of 1.5m x 1m or would be below ground and accessed via manhole covers at ground level (an above ground marker would then be required to mark the location of each link box). Link boxes would be located adjacent to field boundaries and roads as far as possible.

198. Link boxes are required in proximity (within 10m) to the jointing bay locations to allow the cables to be bonded to earth to maximise cable ratings, as described above. Link boxes would not be required at all jointing bay locations but for the as a worst case it is assumed that they could be required up to a frequency of one every 500m.

199. The footprint of the onshore substation would represent permanent land take for the duration of the operational phase.

21.6.2.2.1 Receptor Sensitivity

200. Link boxes would result in the permanent loss of land that varies between ALC grades 2-4, but the majority of the land area is comprised of ALC grade 3. This represents a high sensitivity receptor, when considering permanent loss of agricultural land.

201. The onshore substation is proposed on land classified as ALC grade 3, which when taken out of land use permanently represents a high sensitivity receptor.

21.6.2.2.2 Magnitude of effect

21.6.2.2.2.1 DEP and SEP Isolation

202. The total permanent land take for the footprint of the onshore substation is approximately 3.25ha. DEP or SEP alone would require the installation of up to 120 link boxes, located up to every 500m along the onshore export cable corridor. Should link boxes be installed above ground they would have a footprint of 1.5m x 1m and 1.5m tall . This would represent a total land take of approximately 0.05ha. The total permanent land take would therefore be approximately 3.3ha across the project.

203. At a regional scale, this represents a small proportion of the county resource. Therefore, the impact to agricultural productivity is considered to be of low magnitude.

21.6.2.2.2.2 DEP and SEP Together

204. The development of DEP and SEP concurrently would require the installation of approximately 120 link boxes, or up to approximately 240 link boxes for the sequential scenario, representing a land take of up to 0.1ha. DEP and SEP together would also require a larger area for the onshore substation; up to approximately 6.25ha for the sequential scenario, i.e. a total permanent land take of up to 6.35ha However, at a regional scale, this represents a small proportion of the county resource. Therefore, the impact to agricultural productivity is still considered to be of low magnitude.

21.6.2.2.3 Impact Significance

205. For both DEP and SEP in Isolation and DEP and SEP Together scenarios, prior to mitigation, the greatest magnitude of effect is low magnitude, on a high sensitivity receptor. The impact is therefore predicted to be of **moderate** adverse significance.

21.6.2.2.4 Mitigation Measures

206. Private agreements will be sought between the Applicant and relevant landowners/occupiers regarding any permanent loss of land incurred as a direct consequence of the operation of DEP and SEP.

21.6.2.2.5 Residual Impact

207. Following implementation of mitigation measures the magnitude of impacts will be reduced to negligible and therefore the residual impact significance will be **minor** adverse.

21.6.2.3 Impact 3: ESSs

208. Following construction, all land under an ESS within the onshore cable corridor would be reinstated, with the exception of the link boxes. The onshore substation represents permanent infrastructure that would not be reinstated during operation and has the potential to impact on land designated under ESS.

209. Both onshore substation sites are located entirely within Entry Level plus Higher Level Stewardship areas. Under the scenario where only one of the Projects is brought forward, an onshore project substation of 3.25ha in size would be constructed. Under the scenario where both projects are constructed, the sequential scenario is considered to be the worst case because the onshore substation would have an operational size of 6.25ha. This land would be permanently taken out of use during the operation of DEP or SEP.

210. Given the size of each link box they are expected to have a negligible impact on the management requirements under the ESS. The effect on landowners / occupiers from the construction of the onshore substation is specific to their own scheme, which would need to be discussed between Applicant, landowners, occupiers and Natural England prior to construction.

211. Landowner engagement will form a key part of the DCO boundary refinement, during which information relating to the location, extent and content of ESS agreements will be gathered and fed back into the refinement process for DEP and SEP. This includes gathering information from landowners on any ecological constraints or opportunities associated with existing ESSs.

212. Construction of the onshore substation may result in a landowner / occupier being unable to meet the terms of an agreement. The level of impact could range from the termination of an agreement, to no impact. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent of impacts to specific land parcels.

144. Minimisation of the footprint of the onshore substation would mitigate impact as far as practicable. Where impacts to an agreement cannot be avoided, these will be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate.

21.6.2.4 Impact 4: Utilities

21.6.2.4.1 Receptor Sensitivity

213. Utilities have the potential to be affected by repair activities, since this may require access to buried cables. The potential disruptions that could be caused as a result of disturbances to utilities means that utilities are considered high sensitivity receptors, particularly electricity, gas and water. The majority of the identified utilities crossing the PEIR boundary are for domestic services that include telecom, electricity, water, gas, sewage, unspecified pipeline and street lighting. The PEIR boundary also crosses buried high pressure gas pipelines originating from the Bacton terminal on four occasions (please see **Appendix 5.1 Crossing Schedule**).

214. The PEIR boundary crosses the existing Sheringham Shoal OWF underground cable and passes close to Dudgeon OWF underground cable close to the landfall at Weybourne.

215. Norfolk Vanguard / Norfolk Boreas Offshore Wind Farm and Hornsea Project Three Offshore Wind Farm underground cables run through the PEIR boundary at Cawston and Weston Longville respectively. However, these schemes are not yet constructed.

216. DEP and SEP will undertake utility crossings in accordance with industry standard practice as agreed with the utility owners.

217. The PEIR boundary had been selected to avoid major utilities where possible/practicable. Therefore, **no impacts** associated with existing utilities are anticipated during construction both for DEP and SEP in Isolation and DEP and SEP Together.

21.6.2.5 Impact 5: Closure of Recreational Routes

218. Routine and ad hoc maintenance activities are not anticipated to require disruption to or closure of any paths or non-motorised routes and will not interfere with local recreation activities such as walking or cycling.

219. Any alternative routes proposed for the construction phase would be removed and the original routes reinstated post-construction. **No impact** is therefore predicted during operation.

21.6.2.6 Impact 6: Soil Heating

220. The transmission of electricity results in small energy losses in the form of heat dissipation. DEP and SEP design of the onshore cable will aim to be to minimise such losses. The effects of soil heating are only likely to occur directly above the onshore cable. Based on the study of agricultural land, up to 9ha is potentially affected under the scenario where only one of the projects is brought forward. Up to 18ha of agricultural land is potentially affected under the scenario where both projects are constructed. This calculation assumes the maximum width for impacts immediately above the trench is 1.5m along the entire 60km onshore cable corridor length. The potential impact of any potential soil heating on agricultural production may negatively affect crop growth Receptor Sensitivity

221. Given these characteristics, the soil resource within the PEIR boundary are considered susceptible to soil heating. However, the thermal resistivity of the material immediately surrounding the cables has a much greater bearing on heat dissipation and the backfill will be selected for its properties in this respect. It is therefore considered that the sensitivity of receptor is medium.

21.6.2.6.1 Magnitude of effect all scenarios

222. Any effect on soil heating is highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables will be buried at 1.2m minimum burial depth, with the principal root growth zone generally accepted to be within the first 50mm of the soil from the surface.

223. For both DEP and SEP in Isolation and DEP and SEP Together, the results of the study indicate that the installation of the onshore cable will result in very small increases in topsoil temperature and moderate increases in subsoil temperature in a narrow zone above the cable. No negative impacts on crop growth are therefore anticipated and the impacts magnitude is negligible.

21.6.2.6.2 Impact Significance all scenarios

224. For both DEP and SEP in Isolation and DEP and SEP Together, without mitigation, the magnitude of effect is negligible, on a receptor with a medium sensitivity. The predicted impact is therefore **minor** adverse.

21.6.2.6.3 Mitigation Measures

225. No further mitigation is proposed.

21.6.2.6.4 Residual Impact all scenarios

226. The residual impact would remain **minor** adverse.

21.6.2.7 Impact 7: Electric and Magnetic Fields (EMF)

227. The onshore transmission infrastructure will generate EMF when DEP and SEP is in operation. The 50 Hz EMF generated by this type of electricity transmission are often referred to as power frequency or extremely low frequency (ELF) EMF. ELF EMF are produced wherever electricity is generated, transmitted or used.

21.6.2.7.1 Receptor Sensitivity

228. Public exposure to EMF from DEP and SEP onshore transmission infrastructure will be both transient (e.g. on public footpaths) and residential. Therefore, sensitivity of the receptor is considered high.

21.6.2.7.2 Magnitude of effect all scenarios

229. An EMF study was undertaken for DEP and SEP, and EMF exposure from DEP and SEP onshore transmission infrastructure has been assessed against the general public (as opposed to occupational) exposure guideline.

230. Maximum magnetic field strengths have been calculated for the onshore cable and onshore substation (see **Appendix 30.1** for details). The study concluded that on the basis of the guidance for EMF from electricity infrastructure adopted in the UK and the published evidence to support that, it is considered that the levels of EMF from the both DEP and SEP in Isolation and SEP and SEP Together will be well below the guideline public exposure reference levels set to protect health, and therefore the impact significance is considered negligible.

21.6.2.7.3 Impact Significance all scenarios

231. For both DEP and SEP in Isolation and DEP and SEP Together, without mitigation, the magnitude of effect is negligible, on a receptor with a high sensitivity. The predicted impact is therefore **minor** adverse.

21.6.2.7.4 Mitigation Measures

232. No further mitigation is proposed.

21.6.2.7.5 Residual Impact all scenarios

233. The residual impact would remain **minor** adverse.

21.6.3 Potential Impacts during Decommissioning

234. It is generally accepted that industry best practise, rules and legislation change and develop over time. As a result, no decision has been made regarding the final decommissioning policy for the onshore 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.

235. 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. 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 licencing and consenting approach.

236. 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.

21.7 Cumulative Impacts

21.7.1 Identification of Potential Cumulative Impacts

237. The first step in the cumulative assessment is the identification of which residual impacts assessed for DEP and/or SEP on their own have the potential for a cumulative impact with other plans, projects and activities (described as 'impact screening'). This information is set out in **Table 21–18** below, together with a consideration of the confidence in the data that is available to inform a detailed assessment and the associated rationale. Only potential impacts assessed in **Section 21.6** as negligible or above are included in the CIA (i.e. those assessed as 'no impact' are not taken forward as there is no potential for them to contribute to a cumulative impact).

238. **Table 21–18** concludes that in relation to Land Use, Agriculture and Recreation for all potential cumulative impacts, effects would be highly localised to within around 1km of the development area, therefore given the distances to other projects and limited potential of temporal overlap, there would be limited cumulative impacts.

Table 21–18: Potential Cumulative Impacts (impact screening)

Impact	Potential for Cumulative Impact	Rationale
Construction Impact 1: Agricultural Drainage	Yes	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).
Construction Impact 2: Temporary Loss of land for agriculture	Yes	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.
Construction Impact 3: Soil Degradation	Yes	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.

Impact	Potential for Cumulative Impact	Rationale
Construction Impact 4: Loss of Soil to Erosion	Yes	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.
Construction Impact 5: Impact to ESSs	Yes	Impacts may occur where project boundaries overlap spatially or temporally on land subject to the same ESS. Such impacts have the potential to affect land under ESS (e.g. loss of earnings from ESS or failure to achieve environmental objectives).
Construction Impact 6: 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 impact.
Construction Impact 7: Deterioration of Blue Flag Beaches	No	The project will not have a direct impact on Blue Flag beaches and therefore not taken forward.
Construction Impact 8: Disruption to Onshore Coastal Recreational Assets	No	Considered to have no direct impact, therefore it is not taken forward.
Construction Impact 9: Disruption to users of Inland Recreational Assets	Yes	Impacts may occur but depend on the phasing of works with respect to other projects with the potential for interaction. A sequential construction scenario could increase the likelihood of cumulative impacts.

Impact	Potential for Cumulative Impact	Rationale
Construction Impact 10: Obstruction to Users of Recreational Routes	Yes	Impacts may occur but depend on the phasing of works with respect to other projects with the potential for interaction; cumulative impacts may occur with the onshore cable routes of other offshore wind farms in the surrounding area. A sequential construction scenario could increase the likelihood of cumulative impacts.
Construction Impact 11: Disruption to Open Access and Public Land	Yes	Impacts may occur where project boundaries overlap spatially or temporally on the same land.
Operational Impact 1: Disruption to Field Drainage	No	Considered to have no direct impact, therefore it is not taken forward.
Operational Impact 2: Permanent Loss of land for agriculture	Yes	Cumulative impacts may occur at a county scale where impacts to productivity affect the wider agriculture industry.
Operational Impact 3: ESSs	Yes	Impacts may occur where project boundaries overlap spatially or temporally on land subject to the same ESS. Such impacts have the potential to affect land under ESS (e.g. loss of earnings from ESS or Failure to achieve environmental objectives).
Operational Impact : 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 impact.
Operational Impact 5: Closure of Recreational Routes	No	Considered to have no direct impact, therefore it is not taken forward.
Operational Impact 6: Soil Heating	No	Considered to have no direct impact, therefore it is not taken forward.

Impact	Potential for Cumulative Impact	Rationale
Operational Impact 7: Electric and Magnetic Fields (EMFs)	No	Considered to have no direct impact, therefore it is not taken forward.

21.7.2 Other Plans, Projects and Activities

239. The second step in the cumulative assessment is the identification of the other plans, projects and activities that may result in cumulative impacts for inclusion in the CIA (described as 'project screening'). This information is set out in **Table 21–19** below, together with a consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to DEP and SEP, status of available data and rationale for including or excluding from the assessment.

240. The project screening has been informed by the development of a CIA Project List which forms an exhaustive list of plans, projects and activities in a very large study area relevant to DEP and SEP. 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.

Table 21–19: Summary of projects considered for the CIA in relation to Land Use, Agriculture and Recreation (projects screened in)

Project	Status	Construction Period	Closest Distance from the PEIR(km)	Included in the CIA (Y/N)	Rationale
Norfolk Vanguard Offshore Wind Farm	DCO Consented[1]	2021-2025	0km - DEP and SEP onshore cable corridor crosses the Norfolk Vanguard onshore cable corridor. 30km between onshore substation Site 1 and Site 2	Y	Overlapping proposed project boundaries may result in impacts of a direct and / or indirect nature during construction and operation.
Hornsea Project Three Offshore Wind farm	Undergoing examination	2021-2025 (single phase) 2021-2031 (two phase)	0km - DEP and SEP onshore cable corridor crosses the proposed Hornsea Three onshore cable corridor. 1.4km from onshore substation	Y	Overlapping proposed project boundaries may result in impacts of a direct and / or indirect nature during construction and operation.

[1] Following completion of this CIA, the ruling of a Judicial Review brought against the Secretary of State for Business Energy and Industrial Strategy's (BEIS) decision to award a DCO for NV has been handed down. The decision to grant the order has been submitted to the Secretary of State for redetermination. BEIS will be considering its options, namely appeal or redetermination. Until such time as this process reached a conclusion it has been decided to maintain the NV/ NB cumulative assessment for stakeholder review.

			Site 1 and 0.95km from onshore substation Site 2		
Norfolk Boreas Offshore Wind farm	DCO Examination	2021-2026	0km –DEP and SEP onshore cable corridor crosses the Norfolk Boreas onshore cable corridor. 30km between onshore substation Site 1 and Site 2	Y	Overlapping proposed project boundaries may result in impacts of a direct and / or indirect nature
A47 North Tuddenham to Easton	Pre-application DCO	2021-2024	0km –A47 crosses the onshore cable corridor of DEP and SEP.	Y	Overlapping proposed project boundaries at Easton may result in impacts of a direct and / or indirect nature during construction.

21.7.3 Assessment of Cumulative Impacts

241. Having established the residual impacts from DEP and/or SEP with the potential for a cumulative impact, along with the other relevant plans, projects and activities, the following sections provide an assessment of the level of impact that may arise.

21.7.3.1 Cumulative Impact during Construction 1: Agricultural Drainage

242. Following the proposed mitigation outlined in **Section 21.3.3**, the residual impact for DEP or SEP in isolation is assessed as negligible, and the residual impact for DEP and SEP together is assessed as minor adverse significance.

243. Norfolk Vanguard / Norfolk Boreas Offshore Wind Farm and Hornsea Project Three Offshore Wind Farm underground cables run through the PEIR boundary at Cawston and Weston Longville respectively. The DEP and SEP onshore cable corridor also overlaps proposed A47 North Tuddenham to Easton works.

244. Due to geographical overlap between these projects there is the potential for direct cumulative impacts upon drainage systems during construction.

245. Potential impacts related to construction works are those associated with intrusive groundworks associated with the projects identified above. The extent of any impact will depend on the presence and location of field drains in the fields where the projects overlap. Any adverse effects would be temporary and reversible for the duration of construction and limited to a relatively limited area of effect where the projects overlap. In the absence of mitigation, direct cumulative magnitude of effect on drains would be considered to be medium, on a medium sensitivity receptor as they have a limited capacity to accommodate changes such as degradation or poor reinstatement of drainage systems, resulting in an impact of moderate adverse significance, but limited to a relatively small area where the projects overlap.

246. However, both DEP/SEP and projects identified would adopt mitigation strategies which will seek to avoid, reduce or offset the effects of direct impacts upon drainage. Hornsea Project Three has committed to specific measures for maintenance and reinstatement, where reasonably practicable, of existing water supplies, irrigation facilities and drainage systems during the construction process will be undertaken (Orsted, 2018). As also proposed for Norfolk Boreas, Norfolk Vanguard have outlined in their ES (Norfolk Vanguard Limited, 2018) that the proposed strategies include a specialist drainage contractor to locate and draw plans of drainage systems, pre-construction drainage plan and installing cables at a depth where they will be laid below the level of typical field drainage pipes to minimise impacts and interaction.

247. The combination of these measures and the mitigation proposed, under all scenarios of DEP/SEP the cumulative magnitude of effect would reduce to low. On this basis the residual cumulative impacts would be of **minor adverse** significance.

21.7.3.2 Cumulative Impact during Construction 2: Temporary Loss of Land for Agricultural

248. The proposed mitigation in **Section 21.6.1.1**, is assessed as reducing the residual impact to minor adverse significance for both DEP or SEP in isolation and DEP and SEP together.

249. Land temporarily taken out of use for DEP and SEP and other projects where they cross would be fully reinstated following construction and the previous land use would be reinstated; therefore no impact is predicted cumulatively for these projects.

21.7.3.2.1 A47 North Tuddenham to Easton

250. Land taken out of use for DEP and SEP in proximity to the A47 Road Improvements would be fully reinstated following construction; therefore no impact is predicted on land use for DEP and SEP in the very localised area in proximity to the A47 works. As such, DEP and SEP would not contribute to any potential cumulative impact.

21.7.3.3 Cumulative Impact during Construction 3: Soil Degradation

251. Following the proposed mitigation outlined in **Section 21.6.1.3,** the residual impact for DEP or SEP in isolation is assessed as negligible, and the residual impact for DEP and SEP together is assessed as minor adverse significance.

252.

253. The cumulative impact of access routes, haul roads and storing heavy materials or equipment to cause soils to be compacted and soil structure to deteriorate is considered to be negligible.

254. Land taken out of use for DEP and SEP and the A47 Road Improvements where the projects intersect would be reinstated following construction; therefore no impact is predicted cumulatively for these two projects.

21.7.3.4 Cumulative Impact during Construction 4: Loss of Soil to Erosion

255. Following the proposed mitigation outlined in **Section 21.6.1.4,** the residual impact for DEP or SEP in isolation is assessed as negligible, and the residual impact for DEP and SEP together is assessed as minor adverse significance.

256. The construction footprint where the projects cables cross is dominated by sandy soils, which have moderate vulnerability to erosion and subsequentially, the sensitivity of the soils to erosion is considered to be moderate.

257. However, the land would be reinstated following construction, and given the relatively small amount of soil that would be affected (where the projects intercept), the magnitude of the effect is negligible. This is considered to be the same under both scenarios of DEP or SEP in isolation and DEP and SEP together.

258. Therefore, the residual cumulative impact is assessed to be minor adverse significance. No additional mitigation is proposed.

21.7.3.5 Cumulative Impact during Construction 5: Impacts to ESS

259. At the point where the DEP and SEP onshore cables would interact with the cables from the Norfolk Vanguard Offshore wind Farm, Hornsea Project Three Offshore Wind farm and Norfolk Boreas Offshore Wind farm there is no land under ESS.

260. There is the potential that the DEP and SEP onshore cables will interact with the A47 North Tuddenham to Easton scheme on land under ESS.

261.

262. Following the proposed mitigation outlined in **Section 21.6.1.5**, the level of cumulative impact from DEP and SEP in combination with the A47 Road Improvements 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. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.

21.7.3.6 Cumulative Impact during Construction 6: Disruption to Users of Inland Recreational Assets

263. The proposed mitigation in **section 21.6.1.9**, is reducing the impact to negligible significance for both DEP or SEP in isolation and DEP and SEP together.

264. Traffic management measures would be implemented (See **Chapter 26 Traffic and Transport** for details) to ensure visitors and the local communities can still access the coast and other key recreation locations.

265. Noise impacts are discussed in **Chapter 25 Noise and Vibration** and dust impacts are discussed in **Chapter 24 Air Quality**. Both are considered not to be significant for in combination with other projects.

266. Cumulative impacts to recreation assets at landfall are assessed to be low magnitude and the sensitivity of affected receptors is assessed to be low. Following the matrix set out in Table 30.8 the cumulative impact is anticipated to be minor adverse significance for the duration of construction activities.

267. Due to the low number of recreation assets in the vicinity of the PEIR boundary, the sensitivity of recreation assets is assessed to be low. Due to the temporary nature of any effect the impact magnitude is also assessed to be low. Therefore, the significance of the cumulative impact is minor adverse.

21.7.3.7 Cumulative Impact during Construction 7: Obstructions to Users Recreational Routes

268. The proposed mitigation in **section 21.6.1.10**, is assessed as reducing residual impacts to these routes to no greater than minor adverse significance for both DEP or SEP in isolation and DEP and SEP together.

269. Both DEP and SEP and Hornsea Project Three will connect to Norwich Main and therefore there is potential to cumulatively effect the following PRoWs:

- Stoke Holy Cross BR3; and
- Swardeston BR9.

270. Any recreational route crossing will be subject to a management plan and mitigation that would be agreed between the projects and with the Local Authority. These could include soft management techniques or provision of alternative routes. However, depending on timings of the projects there may be cumulative impacts of multiple works at the same time, thereby potentially increasing travel times. Any impacts would be short term and temporary for the duration of works at each crossing point.

271. Therefore, cumulatively residual potential impacts to paths or non-motorised routes are anticipated to remain **minor adverse**.

21.7.3.8 Cumulative Impact during Construction 8: Disruption to Open Access and Common Land

272. A small area of open access land or common land has been identified within the PEIR boundary (a Gravel pit south of Weybourne station) as shown **Figure 21-4**.

273. None of the other identified projects cross this area of open access or common land, therefore, no cumulative impacts are anticipated.

21.7.3.9 Cumulative Impact during Operation 1: Change of Land Use

274. Any land taken out of use where DEP/SEP cross either Hornsea Project Three or Norfolk Vanguard / Norfolk Boreas would be fully reinstated following construction and returned to the previous land use; therefore no impact is predicted cumulatively for these projects. Therefore, the cumulative impact is no greater than for DEP/SEP alone, i.e. minor adverse.

21.7.3.10 Cumulative Impact during Operation 2: ESSs

275. At the point where the DEP and SEP onshore cables would interact with the cables from the Norfolk Vanguard Offshore wind Farm, Hornsea Project Three Offshore Wind farm and Norfolk Boreas Offshore Wind farm there is no land under ESS. Therefore, no impact is predicted cumulatively for these projects.

276. There is the potential that the DEP and SEP onshore cables will interact with the A47 North Tuddenham to Easton scheme on land under ESS.

Following construction, all land under an ESS within the onshore cable corridor would be reinstated, with the exception of the link boxes. The link boxes would be located up to every 500m along the onshore export cable corridor. Should link boxes be installed above ground they would have a footprint of 1.5m x 1m and 1.5m tall. Given the size of each link box, they are expected to have a negligible cumulative impact on the management requirements under the ESS.

21.8 Transboundary Impacts

277. There are no transboundary impacts with regard to Land use, Agriculture and Recreation as the areas of effect are not located in proximity to any international boundaries. Transboundary impacts are therefore scoped out of this assessment and are not considered further.

21.9 Inter-relationships

278. **Table 21–20** lists the parameters or ‘sources’ that are considered to interact with receptors identified in this chapter.

Table 21–20: Land Use, Agriculture and Recreation inter-relationships

Topic and description	Related chapter	Section Where addressed in this chapter	Rationale
Construction			
Soil quality	Chapter 20 Onshore Ground Conditions and Contamination	21.4.1.1 21.5.2.2	Changes in soil quality could impact on ground conditions and potential contaminated land.
Agricultural Drainage	Chapter 21 Water Resources and Flood Risk	21.6.1.1	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies
Ecological receptors	Chapter 23 Onshore Ecology	21.5.1.3 21.6.1.5 21.6.1.10	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
Traffic	Chapter 28 Traffic and Transport	21.6.1.8	Changes in land uses e.g. at roads or paths could affect traffic and transport. The impacts of construction traffic may affect access for local communities and tourists.

Topic and description	Related chapter	Section Where addressed in this chapter	Rationale
Onshore noise	Chapter 27 Noise and Vibration	21.6.1.8 21.6.1.9	Noise generated by the project may affect local communities and tourists who use the area for recreation activities including walking, cycling, bird watching and, wildlife appreciation and star gazing.
Tourism	Chapter 30 Socio-Economics	21.5.3.1	The project may affect local businesses in the tourism and recreation industry.
Operation			
Drainage	Chapter 21 Water Resources and Flood Risk	21.6.2	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies

Topic and description	Related chapter	Section Where addressed in this chapter	Rationale
Onshore noise	Chapter 27 Noise and Vibration	21.6.2.5	Noise generated by the project may affect local communities and tourists who use the area for recreation activities including walking, cycling, bird watching and, wildlife appreciation and star gazing.
Visual hinderance	Chapter 29 Visual Impact Assessment	21.6.2.2	Changes to land uses could impact on the landscape and visual amenity. Visual impacts of the project may affect local communities and tourists who use the area for recreation activities including walking, cycling, bird watching and, wildlife appreciation and star gazing.

21.10 Interactions

279. The impacts identified and assessed in this chapter have the potential to interact with each other. The areas of potential interaction between impacts are presented in **Table 21–21**. This provides a screening tool for which impacts have the potential to interact. **Table 21–22** provides an assessment for each receptor (or receptor group) as related to these impacts.

280. Within **Table 21–22** 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 level of impact upon that receptor. Following this, a lifetime assessment is undertaken which considers the potential for impacts to affect receptors across all development phases.

281. The significance of each individual impact is determined by the sensitivity of the receptor and the magnitude of effect; the sensitivity is constant whereas the magnitude may differ. Therefore, when considering the potential for impacts to be additive it is the magnitude of effect which is important – the magnitudes of the different effects are combined upon the same sensitivity receptor.

Table 21–21: Interaction between impacts - screening

Potential Interaction between Impacts											
Construction											
	Impact 1	Impact 2	Impact 3	Impact 4	Impact 5	Impact 6	Impact 7	Impact 8	Impact 9	Impact 10	Impact 11
Impact 1	-	Y	Y	Y	N	N	N	N	N	N	N
Impact 2	Y	-	Y	Y	Y	N	N	N	N	Y	Y
Impact 3	Y	Y	-	Y	Y	N	N	N	N	N	N
Impact 4	Y	Y	Y	-	Y	N	N	N	N	N	N
Impact 5	N	Y	Y	Y	-	N	N	N	N	N	N
Impact 6	N	N	N	N	N	-	Y	Y	Y	N	N
Impact 7	N	N	N	N	N	Y	-	Y	N	N	N
Impact 8	N	N	N	N	N	Y	Y	-	Y	N	N
Impact 9	N	N	N	N	N	Y	N	Y	-	Y	Y

Potential Interaction between Impacts											
Impact 10	N	Y	N	N	N	N	N	N	Y	-	Y
Impact 11	N	Y	N	N	N	N	N	N	Y	Y	-
Operation											
	Impact 1	Impact 2	Impact 3	Impact 4	Impact 5	Impact 6	Impact 7				
Impact 1	-	Y	Y	N	N	N	N				
Impact 2	Y	-	Y	Y	N	N	N				
Impact 3	Y	Y	-	N	N	N	N				
Impact 4	N	Y	N	-	N	N	N				
Impact 5	N	N	N	N	-	N	N				
Impact 6	N	N	N	N	N	-	Y				
Impact 7	N	N	N	N	N	Y	-				
Decommissioning											

Table 21-16 Interaction between impacts – phase and lifetime assessment

	Highest significance level				
Receptor	Construction	Operation	Decommissioning	Phase assessment	Lifetime assessment
Soil	Moderate adverse	Minor adverse	Moderate adverse	**No greater than individually assessed impact** The impacts are considered to have no to minor magnitude of effect on the individual receptors, with impact significance dependent upon the sensitivity of the receptor. Given that the magnitudes are none to minor and that each impact will be managed with standard and best practice methodologies it is considered that there would either be no interactions or that these would not result in greater impact than assessed individually.	***No greater than individually assessed impact*** Most impacts at the landfall, onshore cable corridor and onshore substation will occur during the construction phase. Soil will be reinstated following construction where possible. The impacts to soil during the life of the onshore project substation are negligible. Occasional monitoring will be transient and temporary in nature. Therefore, there are no lifetime effects for receptors.

	Highest significance level				
Recreational assets	Minor adverse	Minor adverse	Minor adverse	**No greater than individually assessed impact** The impacts are considered to have no to minor magnitude of effect on the individual receptors, with impact significance dependent upon the sensitivity of the receptor. Given that the magnitudes are none to minor and that each impact will be managed with standard and best practice methodologies it is considered that there would either be no interactions or that these would not result in greater impact than assessed individually.	***No greater than individually assessed impact*** Increased disruptions to coastal and inland assets are most likely to occur during construction. Impacts will be restricted to times of routine or ad hoc inspection and maintenance, which are transient and temporary in nature. Therefore, there are no lifetime effects for receptors.
Paths and routes	Moderate adverse	No direct impacts	Moderate adverse	**No greater than individually assessed impact** The impacts are considered to have no to minor magnitude of effect on the individual receptors, with impact significance dependent upon the sensitivity of the receptor. Given that the magnitudes are none to minor and that each impact will be managed with standard and best practice methodologies it is considered	***No greater than individually assessed impact*** There will be limited impact to paths and common land during the construction phase. There will be no permanent closure of paths or routes. Therefore, there are no

	Highest significance level				
				that there would either be no interactions or that these would not result in greater impact than assessed individually.	lifetime effects for receptors.

21.11 Potential Monitoring Requirements

282. There are no monitoring requirements relating to Land Use, Agriculture and Recreation.

21.12 Assessment Summary

283. This chapter has provided a characterisation of the existing environment for Land Use, Agriculture and Recreation based on both existing and site specific survey data, which has established that there will be some negligible to minor adverse residual impacts on drainage, land use, soil degradation, soil erosion and open access land during construction, operation and decommissioning phases of DEP and SEP.

284. A summary of the potential impacts identified in relation to Land Use, Agriculture and Recreation is presented in **Table 21–22**.

285. These impacts are driven mainly by the change of land use, soil handling and the disruption to users of PRoW, paths and cycle routes during construction. The construction impacts to land use and soil have a greater likelihood to be more significant on higher sensitivity land (such as ALC Grade 2 land) and land subject to ESSs. The construction stage of the project has the potential to disrupt paths and trails of national and regional importance, which are determined to have high and medium sensitivity to change. However, many of the impacts are temporary and fully reversible once construction is complete. Therefore, it is unlikely that they would result in a negative impact to the area.

286. During operation, the impacts to Land Use, Agriculture and Recreation are limited. This is because the onshore cable is buried. However, residual that impacts to changes in land use and ESSs during operational are no greater than a minor adverse significance. Private agreements will be sought with the relevant landowners/occupiers regarding any permanent loss of land incurred. Recreational users may have some negative perceptions of the presence of a substation but the significance of physical impacts indicate that it is unlikely that they would change their behaviour or stop using the area for recreational purposes.

287. The detail and scope of the decommissioning works will 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 stage.

288. Where minor adverse impacts have been assessed, they are localised and work will be undertaken to mitigate the impacts down to an acceptable level.

Table 21–22: Summary of potential impacts on Land Use, Agriculture and Recreation topic

Potential impact	Receptor	Sensitivity	Magnitude	Pre-mitigation impact	Mitigation measures proposed	Residual impact
Construction						
1	Agricultural Drainage	Medium	Medium	Moderate adverse	Maintaining/reinstating land drainage systems; provision of an ALO and local specialised drainage contractor; implementation of the final CoCP and SMP	Minor adverse
2	Temporary Loss of Land for Agriculture	Medium	Medium	Moderate adverse	Landowner consultation; maintain access for farm vehicles; Plan timing of works; Private agreements	Moderate adverse
3	Soil degradation	Medium	Medium	Moderate adverse	Topsoil stripping; appropriate storage and handling of soils according to their characteristics; Restrict movements of heavy plant vehicles;	Minor adverse

Potential impact	Receptor	Sensitivity	Magnitude	Pre-mitigation impact	Mitigation measures proposed	Residual impact
					Minimising the excavation footprint; SMP; construction method statements for soil handling	
4	Loss of soil to erosion	Low	Low	Minor adverse	Only working in appropriate weather conditions; appropriate soil storage; maintaining effective drainage systems; prompt reinstatement and planting of vegetation; SMP; private agreements	Negligible
5	Impact to ESSs	The level of impact could range from the termination of an agreement, to no impact, or a minor and temporary change. The impact on specific agreements will only be known once the final				

Potential impact	Receptor	Sensitivity	Magnitude	Pre-mitigation impact	Mitigation measures proposed	Residual impact
		DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.				
6	Utilities	No impact	No impact	No impact	No impact	No impact
7	Deterioration of Blue Flag beaches	Low	No impact	No impact	No additional mitigation is required.	No impact
8	Disruption to onshore coastal recreational assets	Low	Negligible	Negligible adverse	Any areas subject to short-term restricted access would be agreed in advance	No impact
9	Disruption to users of inland recreational assets	High	Low	Moderate adverse	Visual and noise impacts should be closely monitored to ensure they do not change; adherence to the OCoCP and OLEMS	Minor adverse
10	Obstruction to users of Recreational Routes	Medium	Medium	Moderate	Pre surveys.	Minor
11	Disruption to open access or public land	Low	Medium	Minor adverse	Measures to avoid sensitive feature	No impact

Potential impact	Receptor	Sensitivity	Magnitude	Pre-mitigation impact	Mitigation measures proposed	Residual impact
Operation						
1	Agricultural Drainage	Medium	Negligible	Minor adverse	No impact	Minor adverse
2	Permanent Loss of Land for Agriculture	High	Low	Moderate adverse	Private agreements will be sought with the relevant landowners/occupiers regarding any permanent loss of land incurred.	Moderate adverse
3	Impact to ESSs	Construction of the onshore substation may result in a landowner / occupier being unable to meet the terms of an agreement. The level of impact could range from the termination of an agreement, to no impact. The impact on specific agreements will only be known once the final DCO boundary has been established, and landowner agreements are in place, confirming the extent and duration of impacts to the onshore substation land parcels.				
4	Utilities	High	No impact	No impact	No additional mitigation is required.	No impact
5	Closure of Recreational Routes	Medium	Medium	Moderate	Pre surveys. Management Plans	Minor
6	Soil Heating	Medium	Negligible	Minor adverse	No additional mitigation is required.	Minor adverse

Potential impact	Receptor	Sensitivity	Magnitude	Pre-mitigation impact	Mitigation measures proposed	Residual impact
7	Electric and Magnetic Fields (EMFs) and cycle routes	High	Negligible	Minor adverse	No additional mitigation is required.	Minor adverse
Decommissioning						
The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.						

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