



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Environmental Statement

Volume 1

Chapter 19 - Land Use, Agriculture and Recreation

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Appendix 19.1 Public Right of Way and Cycle Route Crossings

Glossary of Acronyms

AGI	Above Ground Installation
ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
AONB	Area of Outstanding Natural Beauty
BEIS	Department for Business Energy and Industrial Strategy
CBS	Cement Bound Sand
CIA	Cumulative Impact Assessment
CoCP	Code of Construction Practice
CRoW	Countryside and Rights of Way Act
CSS	Countryside Stewardship Scheme
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for the Environment and Rural Affairs
DEP	Dudgeon Offshore Wind Farm Extension Project
DMRB	Design Manual for Roads and Bridges
ECP	England Coast Path
EEA	European Economic Area
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ELS	Entry Level Stewardship
ELMS	Environment Land Management schemes
EMF	Electric and Magnetic Field
EPP	Evidence Plan Process
ES	Environmental Statement
ESS	Environmental Stewardship Scheme
ETG	Expert Topic Group
FRA	Flood Risk Assessment
Ha	Hectare
HDD	Horizontal Directional Drilling
HLS	Higher Level Stewardship
HRA	Habitats Regulations Assessment

HSE	Health and Safety Executive
IDB	Internal Drainage Board
IEMA	Institute of Environmental Management and Assessment
IES	Institution of Environmental Sciences
IQ	Institute of Quarrying
km	Kilometre
LPA	Local Planning Authority
MAFF	Ministry of Agriculture, Fisheries and Food
NFU	National Farmers Union
NNDC	North Norfolk District Council
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OCoCP	Outline Code of Construction Practice
OELS	Organic Entry Level Stewardship
OLMP	Outline Landscape Management Plan
OWF	Offshore Wind Farm
PAWS	Plantation on Ancient Woodland Site
PEIR	Preliminary Environmental Information Report
PRoW	Public Right of Way
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SMP	Soil Management Plan
SocEnv	Society for the Environment
SSSI	Site of Special Scientific Interest
UK	United Kingdom

Glossary of Terms

Order Limits	The area subject to the application for development consent, including all permanent and temporary works for SEP and DEP.
Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
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 at the coastline at which the offshore export cables are brought onshore, connecting to the onshore cables at the transition joint bay above mean high water
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.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substation. 220 – 230kV.
Onshore Substation	Compound containing electrical equipment to enable connection to the National Grid.
Separated Grid Option	Transmission infrastructure which allows each project to transmit electricity entirely separately.

<p>Sheringham Shoal Offshore Wind Farm Extension Project (SEP)</p>	<p>The Sheringham Shoal Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.</p>
<p>Study area</p>	<p>Area where potential impacts from the project could occur, as defined for each individual Environmental Impact Assessment (EIA) topic.</p>
<p>The Applicant</p>	<p>Equinor New Energy Limited</p>

19 LAND USE, AGRICULTURE AND RECREATION

19.1 Introduction

1. This chapter of the Environmental Statement (ES) describes the potential impacts of the proposed Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP) on land use, agriculture and recreation. The chapter provides an overview of the existing environment for the proposed development, followed by an assessment of the potential impacts and associated mitigation for the construction, operation, and decommissioning phases of SEP and DEP.
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). Details of these and the methodology used for the Environmental Impact Assessment (EIA) and Cumulative Impact Assessment (CIA) are presented in **Chapter 5 EIA Methodology** and **Section 19.5**.
3. The assessment should be read in conjunction with following linked chapters:
 - **Chapter 17 Ground Conditions and Contamination;**
 - **Chapter 20 Onshore Ecology and Ornithology;**
 - **Chapter 21 Onshore Archaeology and Cultural Heritage;**
 - **Chapter 23 Noise and Vibration;**
 - **Chapter 24 Traffic and Transport;**
 - **Chapter 25 Seascape and Visual Impact Assessment;**
 - **Chapter 26 Landscape and Visual Impact Assessment;**
 - **Chapter 27 Socio-Economics and Tourism;** and
 - **Chapter 28 Health.**
4. Additional information to support the land use, agriculture and recreation assessment includes:
 - **Appendix 19.1 Public Rights of Way and Cycle Routes.**

19.2 Consultation

5. Consultation with regards to land use, agriculture and recreation has been undertaken in line with the general process described in **Chapter 5 EIA Methodology** and the **Consultation Report** (document reference 5.1). The key elements to date have included scoping, Section 42 consultation on the Preliminary Environmental Impact Report (PEIR), and public consultation, as well as ongoing engagement with the landowners affected by the DCO order limits.
6. The feedback received throughout this process has been considered in preparing the ES. This chapter has been updated following consultation in order to produce the final assessment submitted within the Development Consent Order (DCO) application. **Table 19-1** provides a summary of the consultation responses received to date relevant to this topic, and details of how the Project team has had regard to the comments and how these have been addressed within this chapter.

7. The consultation process is described further in **Chapter 5 EIA Methodology**. Full details of the consultation process are presented in the **Consultation Report** (document reference 5.1), which has been submitted as part of the DCO application.

Table 19-1: Consultation Responses

Consultee	Date	Comment	Project Response
Scoping			
Planning Inspectorate	Scoping, 2019	<p>Temporary closure / diversion of PRow</p> <p>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.</p>	Impacts to Public Rights of Way (PRow) are considered in Section 19.7.1.9 and 19.7.2.5 .
Planning Inspectorate	Scoping, 2019	<p>Impact on existing utilities</p> <p>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.</p>	<p>Impacts on utilities during operation are assessed in Section 19.7.2.4.</p> <p>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.</p>
Planning Inspectorate	Scoping, 2019	<p>Permanent loss of land</p> <p>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.</p>	Impacts on permanent loss of land during operation are assessed in Section 19.7.2.2 .
Planning Inspectorate	Scoping, 2019	<p>Transboundary impacts</p> <p>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.</p>	Transboundary impacts are scoped out of the assessment. Further details are provided in Section 19.9 .
Planning Inspectorate	Scoping, 2019	<p>Permanent loss of land</p> <p>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.</p>	Permanent land take from the presence of link boxes is considered in Section 19.7.1.1 , 19.7.2.2 and 19.7.2.4 .
Planning Inspectorate	Scoping, 2019	<p>Drainage</p> <p>The ES should explain how land drainage would be reinstated following the completion of construction activities.</p>	Impact mitigation outlined in Section 19.7.1.1 describes the strategy for reinstating land drainage.
Planning Inspectorate	Scoping, 2019	<p>Rights of way, access land, coastal access and National Trail</p> <p>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.</p>	Impacts to access land, public open land, PRow and coastal access routes and mitigation measures are considered in Sections 19.7.1.9 and 19.7.2.5 .
Planning Inspectorate	Scoping, 2019	<p>Public Rights of Way</p> <p>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.</p>	Impacts to the Norfolk Coast Path during construction and associated mitigation measures are considered in Sections 19.7.1.7 and 19.7.1.9 .
Planning Inspectorate	Scoping, 2019	<p>Public Rights of Way</p> <p>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.</p>	Impacts to county trails during construction are considered in Section 19.7.1.9 .

Consultee	Date	Comment	Project Response
Planning Inspectorate	Scoping, 2019	<p>Public Rights of Way</p> <p>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.</p>	<p>An Outline Code of Construction Practice (OCoCP) (Document reference 9.17) including measures to mitigate impacts to users of PRoW is included within the DCO application.</p> <p>Impacts on the ECP, Norfolk Trails, and the PRoW network during construction (and proposed mitigation measures) are also presented in Sections 19.7.1.7 and 19.7.1.9.</p>
Section 42 Responses			
Forestry Commission	Section 42, 2021	<p>Your interactive map indicates that east of the A11 road the corridor of the proposed cabling passes through two woodland shelter belts and three woodlands, namely:</p> <ul style="list-style-type: none"> • The two woodland shelter belts to the south of and attached to School Wood at grid references TG 1588 0279 and TG 1613 0286; • The Oval at TG 1701 0328, Norwich Hill at TG 1721 0334; • The west end of Furze Meadow woodland at TG 1721 0334 <p>The Forestry Commission advocates that wherever possible cabling is tunnelled under woodland shelter belts without the need for excavating an open trench, which greatly disturbs a woodland and the essential root mass. This is especially the case for Norwich Hill woodland. It is hoped that the cabling at that point can avoid the woodland completely by being routed south of Norwich Hill woodland and 50 metres from the perimeter of the woodland to avoid root disturbance.</p>	<p>The Applicant has committed to cross woodland habitat using trenchless crossing techniques.</p>
Health and Safety Executive (HSE)	Section 42, 2021	<p>According to HSE's records parts of the proposed DCO boundary area is within the consultation zones of major accident hazard site or pipelines.</p> <p>HSE would not advise against the onshore corridor or substations as these will have no permanent populations associated with them.</p> <p>Currently HSE cannot give advice on the four proposed locations for the construction compounds as not enough information has been provided. HSE requires the illustrations of the proposed boundaries and details of the populations e.g. numbers of people and where they would be located e.g. mess rooms; numbers of storeys in buildings is also required.</p> <p>Please note HSE cannot give its full advice until this information is provided.</p> <p>The above information is based on the illustrations from Virtual Exhibition for 'on-shore cable corridor', onshore substation and construction compounds</p>	<p>The Applicant notes that part of the DCO order limit falls within the consultation zone of major accident hazard site of pipelines.</p> <p>The Applicant is seeking crossing agreements and/or protective provisions with relevant parties.</p> <p>HSE will be provided with the required information in order to give full advice. Details of the main compound site selection process can be found in ES Appendix 3.3 Onshore Main Construction Compound Site Selection Report.</p>
National Grid	Section 42, 2021	<p>National Grid infrastructure within / in close proximity to the order boundary.</p> <p>Electricity Transmission: National Grid Electricity Transmission has high voltage electricity overhead transmission lines and a high voltage substation cables within the onshore scoping area. The overhead lines and substation form an essential part of the electricity transmission network in England and Wales.</p> <p>Substation: Norwich Main Substation</p> <p>Overhead Lines:</p> <ul style="list-style-type: none"> • 4VV 400kV Norwich Main to Walpole 1 and 2 • 4YM 400kV Bramford to Norwich Main 1 and 2 • PGG 132kV Norwich Main to Norwich Trowse 3 • PHC 132kV Norwich Main to Norwich Trowse 1 	<p>Noted. These assets have been taken into account in the site selection process for the SEP and DEP onshore substation. Protection of National Grid's existing assets will form part of the ongoing development of the substation design and associated landscaping proposals.</p> <p>SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.</p>

Consultee	Date	Comment	Project Response
National Grid	Section 42, 2021	<p>National Grid Gas has high pressure gas transmission pipelines located within or in close proximity to the proposed order limits. The transmission pipelines form an essential part of the gas transmission network in England, Wales and Scotland:</p> <ul style="list-style-type: none"> • Feeder 4 – Suffield to Little Barningham • Feeder 27 – Bacton Terminal to Kings Lynn Tee • Feeder 2 – Erpingham to Guestwick • Feeder 3 – Felthorpe to Hardingham 	<p>Noted. These assets have been considered in the site selection process for the SEP and DEP.</p> <p>SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.</p>
National Grid	Section 42, 2021	<p>The following points should be taken into consideration.</p> <p>Electricity Infrastructure:</p> <ul style="list-style-type: none"> • National Grid's Overhead Line is protected by a Deed of Easement/Wayleave Agreement which provides full right of access to retain, maintain, repair and inspect our asset. • Statutory electrical safety clearances must be maintained at all times. Any proposed buildings must not be closer than 5.3m to the lowest conductor. National Grid recommends that no permanent structures are built directly beneath overhead lines. These distances are set out in EN 43 – 8 Technical Specification for "overhead line clearances Issue 3 (2004) available at: [REDACTED] • If any changes in ground levels are proposed either beneath or in close proximity to our existing overhead lines then this would serve to reduce the safety clearances for such overhead lines. Safe clearances for existing overhead lines must be maintained in all circumstances. • Further guidance on development near electricity transmission overhead lines is available here: [REDACTED] • The relevant guidance in relation to working safely near to existing overhead lines is contained within the Health and Safety Executive's (http://www.hse.gov.uk/) Guidance Note GS 6 "Avoidance of Danger from Overhead Electric Lines" and all relevant site staff should make sure that they are both aware of and understand this guidance. • Plant, machinery, equipment, buildings or scaffolding should not encroach within 5.3 metres of any of our high voltage conductors when those conductors are under their worse conditions of maximum "sag" and "swing" and overhead line profile (maximum "sag" and "swing") drawings should be obtained using the contact details above. • If a landscaping scheme is proposed as part of the proposal, we request that only slow and low growing species of trees and shrubs are planted beneath and adjacent to the existing overhead line to reduce the risk of growth to a height which compromises statutory safety clearances. • Drilling or excavation works should not be undertaken if they have the potential to disturb or adversely affect the foundations or "pillars of support" of any existing tower. These foundations always extend beyond the base area of the existing tower and foundation ("pillar of support") drawings can be obtained using the contact details above. • National Grid Electricity Transmission high voltage underground cables are protected by a Deed of Grant; Easement; Wayleave Agreement or the provisions of the New Roads and Street Works Act. These provisions provide National Grid full right of access to retain, maintain, repair and inspect our assets. Hence we require that no permanent / temporary structures are to be built over our cables or within the easement strip. Any such proposals should be discussed and agreed with National Grid prior to any works taking place. • Ground levels above our cables must not be altered in any way. Any alterations to the depth of our cables will subsequently alter the rating of the circuit and can compromise the reliability, efficiency and safety of our electricity network and requires consultation with National Grid prior to any such changes in both level and construction being implemented. 	<p>Protection of National Grid's existing assets will form part of the ongoing development of the substation design and associated landscaping proposal.</p> <p>SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will include protective provisions in favour of the utilities providers to provide protection for their assets.</p>
National Grid	Section 42, 2021	<p>General Notes on Pipeline Safety:</p>	<p>SEP and DEP would undertake all utility crossings in accordance with industry standard practice as agreed with the utility providers. Furthermore, the DCO will</p>

Consultee	Date	Comment	Project Response
		<ul style="list-style-type: none"> You should be aware of the Health and Safety Executives guidance document HS(G) 47 "Avoiding Danger from Underground Services", and National Grid's specification for Safe Working in the Vicinity of National Grid High Pressure gas pipelines and associated installations - requirements for third parties T/SP/SSW22. National Grid will also need to ensure that our pipelines access is maintained during and after construction. Our pipelines are normally buried to a depth cover of 1.1 metres however; actual depth and position must be confirmed on site by trial hole investigation under the supervision of a National Grid representative. Ground cover above our pipelines should not be reduced or increased. If any excavations are planned within 3 metres of National Grid High Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a National Grid representative. A safe working method agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline. Excavation works may take place unsupervised no closer than 3 metres from the pipeline once the actual depth and position has been confirmed on site under the supervision of a National Grid representative. Similarly, excavation with hand held power tools is not permitted within 1.5 metres from our apparatus and the work is undertaken with NG supervision and guidance. 	include protective provisions in favour of the utilities providers to provide protection for their assets.
Network Rail	Section 42, 2021	<p>The proposed project requires an underground cable to cross Network Rail's operational infrastructure (Breckland Line) located towards the south/south west of Norwich.</p> <p>The proposed Onshore Substation Site Options which form part of the project are located in close proximity to Network Rail's operational infrastructure (Great Eastern Main Line). The Applicant will need to consider the potential impact of construction traffic on level crossings which are situated in proximity to the site. For instance, Swainsthorpe (Public Highway Automatic Half Barriers crossing) is situated on Church Road to the south of the potential Onshore Substations.</p> <p>The Applicant will need to engage with Network Rail in relation to these aspects of the project. An Asset Protection Agreement is required to be signed before proceeding with any design or construction work alongside, above or below Network Rail's infrastructure. Prior to any development / construction or alterations to the site by the Applicant, further site specific safety requirements, engineering technical approval and detailed conditions will need to be sought from Network Rail's Anglia Asset Protection team.</p> <p>Network Rail have standard protective provisions which will need to be included in the DCO as a minimum In addition, a number of legal and commercial agreements will need to be entered into, for example, method statements, connection agreements, property agreements and all other relevant legal and commercial agreements.</p>	<p>The Applicant has identified all the road links required for construction traffic and a detailed assessment is provided in Chapter 24 Traffic and Transport and the Outline Construction Traffic Management Plan (CTMP) (document reference 9.16).</p> <p>SEP and DEP would undertake all crossings of Network Rail infrastructure in accordance with industry standard practice, and as agreed with Network Rail. The Applicant is seeking crossing agreements with Network Rail. Furthermore, the DCO will include protective provisions in favour of Network Rail to provide protection for their assets.</p>
National Farmers Union (NFU)	Section 42, 2021	<p>The NFU understands that the route corridor is presently 200m wide and will be refined to 60m to 100m for where trenchless crossing is required. The NFU requests that it does hold face to face meetings with landowners affected by the proposed 200m route corridor so that it understands what features are on the ground including agricultural buildings, boreholes / reservoirs which supply irrigation systems, main access points to land etc which could be avoided by the final route. Equinor should not only rely on the information it receives to this consultation.</p> <p>It is stated at table 21.3 in Chapter 21: Agriculture that land take has been minimised where possible, reducing sterile land parcels, aligning with field boundaries, and avoiding the best and most versatile land. The NFU believes that for this to be achieved Equinor need to carry out more engagement with landowners and occupiers.</p>	The Applicant has contacted all landowners and/or occupiers affected by the proposal and has sought to have face to face meetings with all affected landowners/occupiers. The site selection exercise has been informed by landowner feedback with regards to the positioning of the cable corridor across individual land parcels.
NFU	Section 42, 2021	The Anglian Water Project which is running through East Anglia has not been mentioned and this will also be crossed by the SEP and DEP project. The NFU believes that the cumulative impact of the SEP and DEP scheme crossing other major linear underground cables and a water pipeline has not been addressed. The impact of crossing points on agricultural land and businesses must be addressed.	The Anglian Water Project is now included within the assessment. Cumulative effects with other utilities are considered in Section 19.8 .
NFU	Section 42, 2021	NFU will be looking for specific wording to be agreed to cover reinstatement and aftercare of soils, working in wet conditions, how top and sub soil is stored, and the carrying out of a detailed pre -construction soil survey to form part of a detailed record of condition. The NFU will want to see this wording agreed in the Code of Construction."	Mitigation measures for soil resources relating to construction activities are outlined in Section 19.7.1 . These are also set out in the Outline Code of Construction Practice (OCocP).

Consultee	Date	Comment	Project Response
NFU	Section 42, 2021	There is concern over heat dissipation from cables as warmer soils have now been seen out on the ground. It has been stated that cement bound sand (CBS) will be required to encase the ducting and this is commonly used to ensure that the thermal conductivity of the material around the cables is of a known consistent value for the length of the installation. Further it is stated that CBS has a low thermal resistance to conduct the heat produced during electricity transmission away from the high voltage cables. It is not stated how much warmer Equinor expect the soil to be around the cables?	Modelling indicates that that top soil temperature will not be significantly impacted. Ground temperature directly on top of each circuit remains at the assumed summer temperature of 15°C. At 0.3m depth the soil will see a maximum temperature of 20°C, assuming an ambient temperature of 15°C. Further details can be found in Section 19.7.2.6 .
NFU	Section 42, 2021	The NFU is pleased to see that Equinor have stated they will appoint an Agricultural Liaison Officer (ALO), the NFU will want to see specific roles being carried out by the ALO. The NFU will provide details of the roles to Equinor and would like to see this wording agreed to be incorporated in the Code of Construction.	An ALO would be employed to ensure that information on existing land conditions is obtained, recorded and verified during these surveys. These role requirements are set out within the OCoCP.
Norfolk County Council	Section 42, 2021	Members enquired if there is potential opportunity to use the cable corridor as a cycle path?	The majority of the land would be returned to its former use following the installation of the cable corridor and there are no plans to repurpose the land into a cycle path.
North Norfolk District Council (NNDC)	Section 42, 2021	Tourism and recreation impact concerns were raised by NNDC in the examination of Ørsted Hornsea Project Three and developed further during the examination of Norfolk Vanguard and Norfolk Boreas. NNDC raised concerns about the Actual Tourism Impact of Negative Perceptions associated with the individual and cumulative impact of wind farm cable route works in North Norfolk. This is likely to be the case also with the SEP and DEP projects which could be taking place within the same timeframe as these other NSIP schemes. The tourism and leisure sector is incredibly fragile from the impacts of Covid-19 and it is important that growth and recovery of this sector in North Norfolk is not adversely affected by wind farm construction activities. Whether it forms part of Requirements/Conditions within the DCO or forming matters to be agreed outside of the DCO process, NNDC would wish to work with Equinor and other wind farm operators to ensure that the construction impacts of the development (both individually and cumulatively) on the tourism and leisure sector are carefully managed as it would be neither fair or reasonable that those businesses should be adversely affected as a result of wind farm projects without some form of mitigation strategy being in place.	Impacts to the tourism sector are considered in Chapter 27 Socio-Economics and Tourism .
Swardeston Parish Council	Section 42, 2021	The PEIR states that significant effects during the construction, operation and decommissioning phases of the onshore substation sites have been identified on the users of a group of Public Rights of Way (PRoW), a permissive bridleway and Gowthorpe Lane that surround the fields in which the onshore substation sites lie. Effects would be at most of major significance and adverse. Chapter 21.7.3.7 identifies obstruction of PRoW Swardeston BR12, Stoke Holy Cross BR3 and Swardeston BR9 in the vicinity of the onshore substation. Para 270 suggests mitigation by way of "soft management" or provision of alternative routes and suggests any impact would be short term and temporary. Para 271 suggests these cumulative residual impacts are minor adverse. Given that SEP and DEP could sequentially impact these paths for up to 8 years and Hornsea Project 3 impacts the same paths with its cable route, the major disruption of a network of well-used paths is unacceptable given that it is impossible to simply take two paths in isolation without considering the whole adjoining local PRoW network. Whatever is meant by "soft management" has to guarantee that these paths remain safely open for the majority of the construction period with no more than the occasional closure or diversion for a short period."	Impacts to the existing network of footpaths is addressed in Section 19.6.1 as well as Appendix 19.1 . There would be no permanent closures of any recreational routes. Any disruption to any recreational routes would be managed to ensure continued safe access for members of the public, and all efforts would be made to minimise the duration of any temporary diversions.
Weybourne Parish Council	Section 42, 2021	Outside the key tourist season, the beach and coast path are still heavily used by walkers, birdwatchers and anglers, and these bring in vital revenue to local businesses in the low season.	Impacts to the beach and Norfolk Coast Path during construction and associated mitigation measures are considered in Sections 19.7.1.7 and 19.7.1.9 The applicant notes the potential adverse effects on local tourism. Impacts to tourism are considered in Chapter 27 Socio-Economics and Tourism .
Weybourne Parish Council	Section 42, 2021	The landowners in the Weybourne area all report adverse impacts to their agricultural land as a result of previous wind farm cables. These are largely the result of damage to underground watercourses and drainage and soil compaction. Further damage from future wind farm cables will make farming less and less viable on the fields affected.	Impacts to agricultural land have been assessed in Section 19.7.1.1 , 19.7.1.2 and 19.7.1.3 , Cumulative effects on land are considered in Section 19.8 . With regards to agriculture, mitigation measures during construction include the use of an ALO, ensuring agricultural drainage systems are maintained and

Consultee	Date	Comment	Project Response
			employing best practice measures in line with a Soils Management Plan.
Natural England	Section 42, 2021	<p>Arable Land</p> <p>There is no discussion on any Countryside Stewardship or Environmental Stewardship schemes agreements in place along the route. The Applicant must consult the Rural Payments Agency at the earliest opportunity to discuss the impacts to schemes.</p>	<p>Agricultural Stewardship Schemes are discussed in Section 19.6.1.2.</p> <p>The Applicant has retrieved land parcel information held by the Rural Payments Agency for agricultural stewardship schemes impacted by the project.</p> <p>Where impacts to an agreement cannot be avoided, these would be dealt with through the Rural Payments Agency, including compensation provisions to reimburse a landowner's financial losses where appropriate.</p>
Woodland Trust	Section 42, 2021	The Woodland Trust is concerned about the proximity of the onshore cable corridor to Colton Wood (grid reference: TG11680878), an area of ancient woodland designated as a Plantation on Ancient Woodland Site (PAWS) on Natural England's Ancient Woodland Inventory. We are also very concerned about the potential direct loss of Ringland Covert, which is likely an area of unmapped ancient woodland.	<p>The proposed order limits do not overlap with the boundary of Colton Wood.</p> <p>The proposed order limits cross Ringland Covert. However, the Applicant has committed to cross woodland habitat using trenchless crossing techniques.</p>

19.3 Scope

19.3.1 Study Area

8. 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 would not occur outside of the DCO order limits. The study area for direct impacts is therefore limited to the DCO order limits (see **Figure 19.1**).
9. It is assumed that indirect impacts could occur outside of the study area boundary 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;
 - District Council boundary: this is the study area to provide the second point on the scale to assess impacts at a district level; and
 - County Council boundary: This is used to provide the third point on the scale to assess impacts at a county level in Norfolk.
10. The direct impact study area and local parish and local authority boundaries are shown in **Figure 19.1**.

19.3.2 Realistic Worst-Case Scenario

19.3.2.1 General Approach

11. The final design of SEP and DEP would be confirmed through detailed engineering design studies that would 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: Rochdale Envelope (v3, 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 5 EIA Methodology**.
12. The realistic worst-case scenarios for the land use, agriculture and recreation assessment are summarised in **Table 19-2**. These are based on the project parameters described in **Chapter 4 Project Description**, which provides further details regarding specific activities and their durations.
13. In addition to the design parameters set out in **Table 19-2**, consideration is also given to how SEP and DEP would be built out as described in **Section 19.3.2.2** below. This accounts for the fact that whilst SEP and DEP are the subject of one DCO application, it is possible that either one or both of the projects would be developed, and if both are developed, that construction may be undertaken either concurrently or sequentially. Further details are provided in **Chapter 4 Project Description**.

19.3.2.2 Construction Scenarios

14. In the event that both SEP and DEP are built, the following principles set out the framework for how SEP and DEP may be constructed:
- SEP and DEP may be constructed at the same time, or at different times;
 - If built at the same time both SEP and DEP could be constructed in four years;
 - If built at different times, either Project could be built first;
 - If built at different times, each Project would require a four year period of construction;
 - If built at different times, the offset between the start of construction of the first Project, and the start of construction of the second Project may vary from two to four years;
 - Taking the above into account, the total maximum period during which construction could take place is eight years for both Projects; and
 - The earliest construction start date is 2025.
15. The impact assessment for land use, agriculture and recreation considers the following development scenarios in determining the worst-case scenario for each topic:
- Build SEP or build DEP in isolation;
 - Build SEP and DEP sequentially with a gap of up to four years between the start of construction of each Project – reflecting the maximum duration of effects; and
 - Build SEP and DEP concurrently – reflecting the maximum peak effects.
16. Any differences between the two projects, or differences that could result from the manner in which the first and the second projects are 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 19.7](#)). For each potential impact only the worst-case construction scenario for two projects is presented, i.e. either concurrent or sequential. The justification for what constitutes the worst-case is provided, where necessary, in [Section 19.7](#).

19.3.2.3 Operation Scenarios

17. Operation scenarios are described in detail in [Chapter 4 Project Description](#). The assessment considers the following three scenarios:
- Only SEP in operation;
 - Only DEP in operation; and
 - The two projects operating at the same time, with a gap of up to four years between each project commencing operation.
18. The operational lifetime of each project is expected to be 40 years.

19.3.2.4 Decommissioning Scenarios

19. Decommissioning scenarios are described in detail in **Chapter 4 Project Description**. Decommissioning arrangements for the onshore elements of SEP and DEP will be agreed through the submission of an onshore decommissioning plan to the relevant planning authority for approval within six months of the permanent cessation of commercial operation (unless otherwise agreed in writing by the relevant planning authority), however for the purpose of this assessment it is assumed that decommissioning of SEP and DEP could be conducted separately, or at the same time.

Table 19-2: Realistic Worst-Case Scenarios

Impact	SEP or DEP in Isolation	SEP and DEP Concurrently	SEP and DEP Sequentially	Notes and Rationale
Construction				
<p>Impact 1 – 6:</p> <ul style="list-style-type: none"> • Agricultural Drainage • Temporary loss of land for Agriculture • Soil Degradation and loss of soil to erosion • Impact to Agri-environment Schemes • Utilities 	<p>Landfall:</p> <ul style="list-style-type: none"> • HDD compound area: 75m x 75m • Total works area: 48,955.1m² • Approximate quantity of excavated material: Total –3,250m³ • Duration: Landfall HDD – 4 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> • Construction corridor width: 45m • Approximate working easement: 27m • Width of topsoil storage: 6m. • Minimum cable burial depth: 1.2m • Approximate quantity of cable trench excavated material: 180,000m³ • Jointing bays: Frequency –every 1km, Number – 60, Dimensions – 16m x 3.5m x 2m (L x W x D), Excavated material per jointing bay – 300m³, Approximate total quantity of joint bay excavated material – 18,000m³ • Total onshore cable corridor works area: 4,566,251m² • Access routes: various from public highway (6m wide) to single tracks (3m wide) • Haul road: Dimensions –55km x 5m (L x W), approximate excavated material – 123,000m³ • Main construction compound: Number – 1, Area – 30,000m², in use for full duration of onshore construction works • Secondary construction compounds (with Cement-Bound Sand (CBS) batching): Number – 2, Area – 7,500m², Duration – 18-24 months (active in operation for ~14 months) • Secondary construction compounds (without CBS batching): Number – 6, Area – 2,500m², Duration – 12-18 	<p>Landfall:</p> <ul style="list-style-type: none"> • HDD compound area: 75m x 75m • Total works area: 48,955.1m² • Approximate quantity of excavated material: Total –3,450m³ • Duration: Landfall HDD – 5 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> • Construction corridor width: 60m • Approximate working easement: 38m • Width of topsoil storage: 7m. • Minimum cable burial depth: 1.2m • Approximate quantity of cable trench excavated material: 360,000m³ • Jointing bays: Frequency –every 1km, Number – 120, Dimensions – 16m x 3.5m x 2m (L x W x D), Excavated material per jointing bay –300m³, Approximate total quantity of joint bay excavated material – 36,000m³ • Total onshore cable corridor works area: 4,566,251m² • Access routes: various from public highway (6m wide) to single tracks (3m wide) • Haul road: Dimensions –55km x 5m (L x W), approximate excavated material – 123,000m³ • Main construction compound: Number – 1, Area – 30,000m², in use for full duration of onshore construction works • Secondary construction compounds (with CBS batching): Number – 2, Area – 7,500m², Duration – 18-24 months (active in operation for ~14 months) • Secondary construction compounds (without CBS batching): Number – 6, Area – 2,500m², Duration – 12-18 months (active in operation for ~6 months) • Approximate quantities of excavated material: Cable trench: 360,000m³, Haul Road: 123,000m³, Jointing bays and link boxes: 36,000m³ 	<p>Landfall:</p> <ul style="list-style-type: none"> • HDD compound area: 75m x 75m for each project • Total works area: 48,955.1m² per project • Approximate quantity of excavated material: Total – 6,500m³ • Duration: Landfall HDD – 4 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull per project <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> • Construction corridor width: 60m • Approximate working easement: 45m • Width of topsoil storage: 6m per project • Minimum cable burial depth: 1.2m • Approximate quantity of cable trench excavated material: 360,000m³ • Jointing bays: Frequency –every 1km, Number – 120, Dimensions – 16m x 3.5m x 2m (L x W x D), Excavated material per jointing bay –300m³, Approximate total quantity of joint bay excavated material –36,000m³ • Total onshore cable corridor works area: 4,566,251m² • Access routes: various from public highway (6m wide) to single tracks (3m wide) • Haul road: Number – 1 for each project, Dimensions –55km x 5m (L x W), approximate excavated material – 123,000m³ • Main construction compound: Number – 1, Area – 30,000m², in use for full duration of onshore construction works • Secondary construction compounds (with CBS batching): Number – 2, Area – 7,500m², Duration – 18-24 months (active in operation for ~14 months) • Secondary construction compounds (without CBS batching): Number – 6, Area – 2,500m², Duration – 12-18 months (active in operation for ~6 months) • Approximate quantities of excavated material: Cable trench: 360,000m³, Haul Road: 123,000m³, Jointing bays and link boxes: 36,000 m³, Temporary Compounds: 21,450m³, Total: 540,450m³ Duration: Onshore cable ducting and installation (incl. reinstatement): 28 months 	<p>The total areas and volumes excavated contextual the impacts and allow for defining the magnitude of impact on receptors</p> <p>The onshore cable duct would 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.</p>

Impact	SEP or DEP in Isolation	SEP and DEP Concurrently	SEP and DEP Sequentially	Notes and Rationale
	<p>months (active in operation for ~6 months)</p> <ul style="list-style-type: none"> Approximate quantities of excavated material: Cable trench: 180,000m³, Haul Road: 123,000m³, Jointing bays and link boxes: 18,000m³, Temporary Compounds: 21,450m³, Total: 342,450m³ Duration: Onshore cable ducting and installation (incl. reinstatement): 26 months 	<p>36,000 m³, Temporary Compounds: 21,450m³, Total: 540,450m³</p> <ul style="list-style-type: none"> Duration: Onshore cable ducting and installation (incl. reinstatement): 28 months 		
<p>Impact 7 – 11:</p> <ul style="list-style-type: none"> Deterioration of Blue flag Beaches Disruption to onshore coastal recreational assets Disruption to users of inland recreational assets Disruption to users of Recreational Routes Disruption to open access or public land 	<p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 4.25ha (3.25ha permanent + 1.0ha temporary). Duration: site preparation –6 months, construction – 22 months 	<p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 7.0ha (6.0ha permanent + 1.0ha temporary). Duration: site preparation –6 months, construction – 24 months 	<p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 7.0ha (6.0ha permanent + 1.0ha temporary). Duration per project: site preparation – 6 months, construction – 22 months 	<p>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 would be required to be performed on the beach that may require short periods of restricted access.</p> <p>The onshore cable duct would 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.</p>
<p>Impact 1 – 7:</p> <ul style="list-style-type: none"> Disruption to field drainage Permanent loss of land for agriculture CSSs Utilities Closure of recreational routes 	<p>Landfall:</p> <ul style="list-style-type: none"> HDD horizontal length: 1150m. HDD compound area: 75m x 75m Offshore cable laying vessels at least 1km from the shore Duration: Landfall HDD – 4 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> Construction corridor width: 45m Access routes: various from public highway (6m wide) to single tracks (3m wide) Haul road: Dimensions –55km x 5m (L x W) Duration: Onshore cable ducting and installation (incl. reinstatement): 26 months <p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 4.25ha (3.25ha permanent + 1.0ha temporary). Duration: site preparation – 6 months, construction – 22 months 	<p>Landfall:</p> <ul style="list-style-type: none"> HDD horizontal length: 1150m. HDD compound area: 75m x 75m Offshore cable laying vessels at least 1km from the shore Duration: Landfall HDD – 5 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> Construction corridor width: 60m Access routes: various from public highway (6m wide) to single tracks (3m wide) Haul road: Dimensions –55km x 5m (L x W) Duration: Onshore cable ducting and installation (incl. reinstatement): 28 months <p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 7.0ha (6.0ha permanent + 1.0ha temporary). Duration: site preparation – 6 months, construction – 24 months 	<p>Landfall:</p> <ul style="list-style-type: none"> HDD horizontal length: 1150m. HDD compound area: 75m x 75m for each project Offshore cable laying vessels at least 1km from the shore Duration: Landfall HDD – 4 months (site setup, drilling and duct pull-in and demobilization), followed by cable pull per project <p>Onshore Cable Corridor:</p> <ul style="list-style-type: none"> Construction corridor width: 60m Access routes: various from public highway (6m wide) to single tracks (3m wide) Haul road: Number – 1 for each project, Dimensions –55km x 5m (L x W) Duration: Onshore cable ducting and installation (incl. reinstatement): 28 months <p>Onshore Substation and 400kv connection:</p> <ul style="list-style-type: none"> Total construction area: 7.0ha (6.0ha permanent + 1.0ha temporary). Duration per project: site preparation – 6 months, construction – 22 months 	<p>If SEP and DEP were constructed the realistic worst-case scenario would involve disruption to field drainage, loss of agricultural land, impacts to agri-environmental schemes and utilities, closure of recreational routes and soil heating along the 20m</p>
<p>Operation</p>	<p>Cable Corridor:</p> <ul style="list-style-type: none"> Permanent easement: Length: 60km, Width: 10m. Number of trenches: 1. <p>Substation:</p> <ul style="list-style-type: none"> Permanent area: Substation platform - 3.25ha, Access road - 5,100m² 	<p>Cable Corridor:</p> <ul style="list-style-type: none"> Permanent easement: Length: 60km, Width: 20m. Number of trenches: 2. <p>Substation:</p>	<p>Cable Corridor:</p> <ul style="list-style-type: none"> Permanent easement: Length: 60km, Width: 20m. Number of trenches: 2. <p>Substation:</p> <ul style="list-style-type: none"> Permanent area: Substation platform - 6.0ha, Access road - 5,100m² 	

Impact	SEP or DEP in Isolation	SEP and DEP Concurrently	SEP and DEP Sequentially	Notes and Rationale
<ul style="list-style-type: none"> Soil Heating 	<ul style="list-style-type: none"> Duration: 40 years 	<ul style="list-style-type: none"> Permanent area: Substation platform – 6.0ha, Access road - 5,100m² Duration: 40 years 	<ul style="list-style-type: none"> Duration: 40 years 	permanent easement along the 60km cable corridor and the 6.0ha substation area.
<p>Decommissioning</p> <p>No final decision has yet been made regarding the final decommissioning policy for the onshore project infrastructure including landfall, onshore cable corridor 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, would 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 would be determined by the relevant legislation and guidance at the time of decommissioning and would be agreed with the regulator. It is anticipated that for the purposes of a worst-case scenario, the impacts would be no greater than those identified for the construction phase.</p>				

19.3.3 Summary of Mitigation Embedded in the Design

20. This section outlines the embedded mitigation relevant to the land use, agriculture and recreation assessment, which has been incorporated into the design of SEP and DEP (**Table 19-3**). Where other mitigation measures are proposed, these are detailed in the impact assessment (**Section 19.7**).

Table 19-3: Embedded Mitigation Measures

Parameter	Mitigation Measures Embedded into the Project Design
Site selection	SEP and DEP 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 and roads) in collaboration with the engineering design requirements (for more information see Chapter 3 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	The Applicant has committed to installing the cables at landfall using HDD, thereby avoiding physical disturbance or prolonged access restrictions to Weybourne beach.
Haul road	The Applicant has included a haul road to deliver equipment to the installation site from construction compounds. This will limit physical disturbance to a specific area. Following an initial topsoil strip, the haul road would be installed in stages as each work front progresses. It would be formed of protective matting, temporary metalled road or permeable gravel aggregate dependent on the ground conditions, vehicle requirements and any necessary protection for underground services.
Construction corridor	As well as a working easement, the construction corridor will have sufficient space allowed to ensure appropriate soil management and pre-construction drainage.

19.4 Policy, Legislation and Guidance

19.4.1 National Policy Statements

21. The assessment of potential impacts upon land use, agriculture and recreation has been made with specific reference to the relevant National Policy Statements (NPS). These are the principal decision-making documents for Nationally Significant Infrastructure Projects (NSIPs). Those relevant to SEP and DEP 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).
22. The specific assessment requirements for land use, agriculture and recreation, as detailed in the NPS, are summarised in **Table 19-4** together with an indication of the section of the ES chapter where each is addressed.

23. It is noted that the NPS for Renewable Energy (EN-1, EN-3 and EN-5) is in the process of being revised. A draft version was published for consultation in September 2021 (Department for Business Energy and Industrial Strategy (BEIS), 2021a, b and c). A review of this draft version has been undertaken in the context of this ES chapter.
24. In addition, it should be noted that requirements associated with land use, agriculture and recreation are not included within EN-3 and so have not been discussed in the table below.

Table 19-4: NPS Assessment Requirements

NPS Requirement	NPS Reference	Section Reference
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 would be avoided via trenchless crossing techniques (HDD). Please see Section 19.7 .
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 19.6 and new developments or proposed projects are assessed for potential cumulative impacts in Section 19.8 .
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 SEP and DEP have consulted with statutory and non-statutory stakeholders, local communities, and the public. Within the current DCO order limits, there is no plan to build on any open space, sports or recreational buildings and land.
Paragraph 5.10.7 requests that the LPA [Local Planning Authority] 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 SEP and DEP have consulted with the relevant local authorities. SEP and DEP have been reviewed against the Development Plan and other relevant planning applications (see Section 19.8). Section 19.7 assesses the land take associated with the onshore elements of SEP and DEP.
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 19.6 and 19.7

NPS Requirement	NPS Reference	Section Reference
Paragraph 5.10.9 requests that Applicant should safeguard any mineral resources on the proposed site.	Paragraph 5.10.9	Potential impacts to mineral resources is assessed in Chapter 17 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	The location of permanent above ground infrastructure (the substation) avoids the most versatile agricultural land. See Sections 19.6 and 19.7
NPS for Energy (EN-1) – draft for consultation 2021		
Applicants should identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed.	5.11.8	See Sections 19.6 and 19.7
Applicants are encouraged to develop and implement a Soil Management Plan	5.11.8	A Soil Management Plan (SMP) will be developed and will set out procedures for the appropriate handling of soils during the works. See Section 19.7.1.3 .
Applicants should determine whether their proposal, or any part of it, is within an established Green Belt and if it is, whether their proposal may be inappropriate development within the meaning of Green Belt policy	5.11.10	The DCO order limits do not fall within an established Green Belt.
Applicants should take appropriate mitigation measures to address adverse effects on coastal access, National Trails, other rights of way and open access land	5.11.23	See Section 19.7.1.9
NPS for Electricity Networks Infrastructure (EN-5)		
Paragraph 2.10.8 states that there is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line electric and magnetic fields has any agriculturally significant consequences.	2.10.8	No impacts associated with electric and magnetic fields (EMF) on land use, agriculture or recreation are anticipated and so are not discussed within this chapter. For impacts associated with health please refer to Chapter 28 Health
NPS for Electricity Networks Infrastructure (EN-5) – draft for consultation 2021		
Paragraph 2.11.14 point 4 requests that the Secretary of State considers: <ul style="list-style-type: none"> the developer’s commitment, as set out in their ES, to mitigate the potential 	2.11.14	See Section 19.7.1.2 and 19.7.2.2 .

NPS Requirement	NPS Reference	Section Reference
<p>detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code.</p>		

19.4.2 Other Policy, Legislation and Guidance

25. 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. Further detail where relevant is provided in **Chapter 2 Policy and Legislative Context**.

19.4.2.1 Legislation

26. The following UK legislation are considered the most relevant to land use and agriculture and recreation considered in this chapter.
- Environment Act 2021;
 - Marine and Coastal Access Act 2009;
 - Planning Act 2008;
 - The Commons Act 2006;
 - The Environmental Stewardship (England) Regulations 2005 (as amended); and
 - Countryside and Rights of Way Act (CRoW) 2000.

19.4.2.2 Local Policy

27. 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.
28. The DCO order limit 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.

29. 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).

19.4.2.3 Guidance

30. 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;
- Department for Communities and Local Government (2002) Planning Policy Guidance 17: Planning for open space, sport and recreation;
- Institution of Environmental Sciences (IES) (2020) Sustainable, healthy, and resilient: Practice-based approaches to land and soil management;
- British Society of Soil Science (2021) Guidance Document 3 Working with Soil Guidance Note: Benefitting from soil management in development and construction;
- Society for the Environment (SocEnv) (2021) Soils and Stones Report; and
- The Institute of Quarrying (IQ) (2021) Good Practice Guide for Handling Soils in Mineral Workings.
- Institute of Environmental Management and Assessment (IEMA) (2022) A New Perspective on Land and Soil in Environmental Impact Assessment.

19.4.3 Data and Information Sources

19.4.3.1 Site Specific Surveys

31. In order to provide site specific and up to date information on which to base the impact assessment, a site characterisation survey was conducted with a Phase 1 habitat Survey (see **Chapter 20 Onshore Ecology and Ornithology**).

19.4.3.2 Other Available Sources

32. Other sources that have been used to inform the assessment are listed in **Table 19-5**.

Table 19-5: Other Available Data and Information Sources

Data set	Source	Spatial coverage	Year	Notes
Road maps, railway lines and urban areas	ESRI ArcGIS Base maps	Landfall, onshore cable corridor, onshore substation	2021	NA
Datasets on the structure of the agricultural industry	Defra	Norfolk	2019	NA
Soil types	Cranfield University	Landfall, onshore cable corridor, onshore project substation	2021	NA
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	<p>████████████████████</p> <p>████████████████████</p> <p>████████████████████</p> <p>https://www.norfolk.gov.uk/out-and-about-in-norfolk</p> <p>Norfolk Trails Interactive Map - Norfolk County Council</p>	Norfolk	2021	NA
Blue flag beaches	████████████████████	Norfolk	2021	NA
Details of the Broads activities	www.broads-authority.gov.uk	Norfolk	2021	NA
Definitive PRow Map	Norfolk County Council	Norfolk	2021	NA

19.5 Impact Assessment Methodology

33. **Chapter 5 EIA Methodology** provides a summary of the general impact assessment methodology applied to SEP and DEP. The following sections confirm the methodology used to assess the potential impacts on land use, agriculture and recreation.

19.5.1 Definitions of Sensitivity and Magnitude

34. 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 land use, agriculture and recreation assessment are provided in **Table 19-6** and **Table 19-7**.

35. 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 assets 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 27 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 17 Onshore Ground Conditions and Contamination**. **Table 19-6** 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 19-6: 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.		
	<ul style="list-style-type: none"> • Planning policy areas designated at national and international scale; • Higher level Environmental 	<ul style="list-style-type: none"> • Land at Agricultural Land Classification (ALC) Grade 1 or 2; 	<ul style="list-style-type: none"> • Recreational feature of national value; • National trails or paths e.g. Norfolk Coastal Path;

Sensitivity	Definition		
	Land use	Agriculture and soils	Recreation
	<p>Stewardship schemes; Higher tier Countryside Stewardship Schemes;</p> <ul style="list-style-type: none"> • Future large-scale planning use applications; or • Regionally distinctive and rare land uses that cannot be replaced or adapted. 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • European Protected Sites; or • Nationally important landscapes e.g. Norfolk Coast Area of Outstanding Natural Beauty (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.		
	<ul style="list-style-type: none"> • Locally designated planning policy areas; • Entry level environmental stewardship farms; Mid-Tier and Wildlife Offers Countryside Stewardship Schemes; or • Land used for specific and regionally important agriculture or horticulture. 	<ul style="list-style-type: none"> • Land at ALC Grade 3 with respect to temporary land take; or • Soil which is vulnerable to seasonal structural damage or erosion. 	<ul style="list-style-type: none"> • Recreational feature of regional value; • Blue flag beaches; • Public rights of way; (footpaths, bridleways and byways); or • Stewardship bridleways (a public footpath, that has been granted bridleway status under a stewardship scheme, courtesy of the landowners)
Low	Receptor has moderate capacity to accommodate changes such as loss of recreational activity / area, loss of land area, soil degradation etc.		
	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Land at ALC Grade 4; • Arable or pasture grassland; or • Medium to coarse soil with some resistance to structural damage. 	<ul style="list-style-type: none"> • Recreational asset 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.		
	<ul style="list-style-type: none"> • No environmental stewardship schemes or other environmental 	<ul style="list-style-type: none"> • Land at ALC Grade 5 or Urban; 	<ul style="list-style-type: none"> • Recreational feature with limited or no recreational value.

Sensitivity	Definition		
	Land use	Agriculture and soils	Recreation
	management schemes.	<ul style="list-style-type: none"> Land which is not agricultural, arable or pasture grassland; or Soil with a greater resistance to structural damage. 	

Table 19-7: Definition of Magnitude for Land use, Agriculture and Recreation Receptor

Magnitude	Definition		
	Land use	Agriculture and soils	Recreation
High	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Permanent loss of >20ha of Grade 1, 2 or 3 agricultural land or >60% total Norfolk regional resource (Natural England, 2012); or Full land recovery in excess of 10 years. 	<ul style="list-style-type: none"> Permanent closure of a recreation feature or permanent reduction in amenity value.
Medium	<ul style="list-style-type: none"> Moderate, permanent or long-term (5-10 years) reversible changes, over the majority of the receptor, affecting usability, risk, value over the local area, possibly affecting regulatory compliance; Existing land use would not be able to continue on <5ha of land; or Noticeable changes to the existing land use. 	<ul style="list-style-type: none"> 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; >20ha of soil is temporarily unsuitable for agriculture; or <10ha of any agricultural land permanently lost from agriculture. 	<ul style="list-style-type: none"> Temporary closure or disruption to a recreation feature or temporary reduction in amenity value (works <100m of the feature).
Low	<ul style="list-style-type: none"> Temporary change affecting usability, risk or value over the short-term (<5 years); or 	<ul style="list-style-type: none"> Short term loss of >20ha, or permanent loss of >10ha of Grade 4 land or >10% of regional resource; 	<ul style="list-style-type: none"> Temporary reduction in amenity value of a recreation feature (works 100m - 250m of feature).

Magnitude	Definition		
	Land use	Agriculture and soils	Recreation
	<ul style="list-style-type: none"> Temporary change affecting usability within the site boundary; or measurable permanent change with minimal effect on usability, risk or value; no effect on regulatory compliance. 	<ul style="list-style-type: none"> Full land recovery expected within 5 years; or <20ha of soil is temporarily unsuitable for agriculture or <1ha is permanently lost from agriculture. 	
Negligible	<ul style="list-style-type: none"> Minor permanent or temporary change, undiscernible over the medium- to short-term, with no effect on usability, risk or value. 	<ul style="list-style-type: none"> No identifiable material changes to the soil resource; or Small areas <1,000m² is permanently lost from Agriculture. 	<ul style="list-style-type: none"> No direct impact to feature and no amenity loss (works in excess of 250m distance separation).

19.5.2 Impact Significance

36. In basic terms, the potential significance of an impact is a function of the sensitivity of the receptor and the magnitude of the effect (see **Chapter 5 EIA Methodology** for further details). The determination of significance is guided by the use of an impact significance matrix, as shown in **Table 19-8**. Definitions of each level of significance are provided in **Table 19-9**.
37. 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 the overall impact in order to determine a residual impact upon a given receptor.

Table 19-8: 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 19-9: 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

Significance	Definition
	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.

19.5.3 Cumulative Impact Assessment Methodology

38. The CIA considers other plans, projects and activities that may impact cumulatively with SEP and DEP. As part of this process, the assessment considers which of the residual impacts assessed for SEP and/or DEP 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 5 EIA Methodology** provides further details of the general framework and approach to the CIA.
39. For land use, agriculture and recreation, these activities include other large-scale linear projects such as cable installations for other offshore wind farms (OWF); large-scale housing projects; large scale commercial and industrial projects, changes to infrastructure and community facilities and changes to agricultural land use.

19.5.4 Transboundary Impact Assessment Methodology

40. The transboundary assessment considers the potential for transboundary effects to occur on receptors as a result of SEP and DEP; either those that might arise within the Exclusive Economic Zone (EEZ) of European Economic Area (EEA) states or arising on the interests of EEA states e.g. a non-UK fishing vessel. **Chapter 5 EIA Methodology** provides further details of the general framework and approach to the assessment of transboundary effects.
41. 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 19-1**).

19.5.5 Assumptions and Limitations

42. Potential impacts to assets are based on a quantitative assessment where possible, as outlined in **Table 19-7**, 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.

- 43. 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 most accurate at the time of data collection, and therefore should only be considered indicative of the land uses found within the study areas.
- 44. Impacts on soil resources are not predicted to extend beyond the direct impact study area (DCO order limits). Therefore, any impacts to the wider area are not considered as part of this assessment. 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.

19.6 Existing Environment

19.6.1 Land Use

- 45. The land use within the study area primarily comprises of agricultural land, some of which are enrolled on Agri-environment schemes. The study area overlaps nationally important designations and landscapes. This section also considers invasive species and utilities that intersect the study area.

19.6.1.1 Land Use Designations

19.6.1.1.1 *European sites, National designations and Nationally Important Landscapes*

- 46. The study area overlaps with the River Wensum Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). The features of these designated sites along with Ancient Woodland are discussed further in **Chapter 20 Onshore Ecology and Ornithology** and the **Habitats Regulations Assessment**.
- 47. The study area also crosses through the Norfolk Coast Area of Outstanding Natural Beauty (AONB) and the Norfolk Broads National Park. Landscape designations are discussed further in **Chapter 26 Landscape and Visual Impact Assessment**.

19.6.1.1.2 *County Wildlife Sites*

- 48. The study area includes some, if not all of, the County Wildlife Sites presented in **Table 19-10** and presented on **Figure 19.2**. Reference should be made to **Chapter 20 Onshore Ecology and Ornithology** for additional details.

Table 19-10: County Wildlife Sites Crossed

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 Brook House Marshes CWS no. 2315
North Norfolk District Council	Beach Lane, Weybourne CWS no. 1156 Kelling Heath Park and 100 Acre Wood CWS no. 1150
South Norfolk Council	River Tud at Easton and Honingham CWS no. 250 Yare Valley (Marlingford Hall) CWS no. 229

District Council	County Wildlife Site
	Yare Valley (Colton Wood) CWS no. 228

19.6.1.1.3 Site allocations

49. 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.
50. The review indicated that the study area does not include or cross through any preferred sites allocated for housing, commercial, employment or special policy under Broadland District Council (2016), North Norfolk District Council (2011) or South Norfolk Council (2015).

19.6.1.2 Agri-environment Schemes

51. Agri-environment schemes require land managers, including farmers, to implement environmentally beneficial management and to demonstrate good environmental practice on their land.
52. Environmental Stewardship Schemes (ESS) are schemes under which farmers and land managers are paid for effectively managing their land in a manner which protects and enhances the environment and wildlife. The scheme 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).
53. 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 is administered by Natural England and the Rural Payments Agency on behalf Defra.
54. The scheme has three levels:
 - Entry Level Stewardship (ELS): simple and effective environmental management open to all farmers and land managers;
 - Organic Entry Level Stewardship (OELS): a whole farm scheme similar to ELS, but open to farmers or land managers who manage all or part of their land organically; and
 - 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.
55. The Countryside Stewardship Scheme (CSS) has sought to replace the ESS. The overarching aim of the scheme is to look after and improve the environment by conserving and restoring wildlife habitats, managing flood risk, creating and managing woodland, and reducing agricultural water pollution.

56. Similarly to the previous ESS, CSS is divided into a number of elements, including:
- Mid-Tier – These are multi-year agreements that focus on widespread environmental issues, such as reducing water pollution or improving the farmed environment for farmland birds and wild pollinators.
 - Wildlife Offers – These are multi-year agreements with a range of highly targeted and effective options which include creating sources of nectar and pollen, winter food for seed-eating birds and improved habitats. The offers are tailored to specific farming practises.
 - Higher Tier – These are multi-year agreements for the most environmentally important sites, including commons and woodlands. These are usually in places that need complex management, such as restoring habitats, and improving woodland.
 - Capital Grants – These are typically for two years and there are four different options available:
 - Hedgerows and boundaries – capital grant to restore existing farm boundaries
 - Woodland Management Plans – one-off payment to support the production of UK Forestry Standard compliant 10-year woodland management plan
 - Woodland Tree Health – one-off payment to restock or improve woodland due to tree health problems
 - Woodland creation grant – two-year capital grant to plant and protect young trees
57. Environment Land Management schemes (ELMS) are planned from 2022 and will eventually replace CSS. Three new schemes have been developed to support and reward environmental land management and the rural economy, whilst also contributing to government targets and commitments to net zero emissions by 2050. These schemes include:
- Sustainable Farming Incentive;
 - Local Nature Recovery; and
 - Landscape Recovery.
58. The location and area of the Agri-environment schemes within the study area are shown in **Figure 19-3** and **Table 19-11**.

Table 19-11: Agri-environment Agreements Within the Onshore Study Area

Scheme	Count	Area (Ha) of ESS within study area	% of study area
ELS only	0	n/a	n/a
OELS	0	n/a	n/a
ELS plus HLS	16	168.14	0.39
HLS only	0	n/a	n/a
OELS plus HLS	0	n/a	n/a
CSS Mid Tier	10	100.45	19.74

Scheme	Count	Area (Ha) of ESS within study area	% of study area
CSS Higher Tier	2	5.38	1.06
CSS Wildlife offers	0	n/a	n/a
CSS Capital Grants	1	0.06	0.01

19.6.1.3 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 occasional Himalayan balsam *Impatiens glandulifera* present within some watercourses along the cable corridor (see **Chapter 20 Onshore Ecology and Ornithology** for more details).

19.6.1.4 Utilities

59. There are a number of existing utilities which have been identified within the study area. These include major and minor (domestic) utilities, with domestic utilities often being routed under the public highway. The **Crossing Schedule** (document no. 6.3.4.1) provides a full list of all proposed utility crossings.

60. The majority of the identified utilities intersecting the study area are for domestic services and include telecom, electricity, water, gas, sewage, unspecified pipelines and street lighting. There are also nine crossings of buried high pressure gas pipelines.

61. The study area crosses the existing Sheringham Shoal OWF export cables and passes close to the existing Dudgeon OWF export cables at the landfall location near Weybourne.

62. The proposed Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF export cable corridors also run through the study area (near to Cawston and Weston Longville, respectively).

19.6.2 Agriculture and Soils

19.6.2.1 Agricultural Activities

63. Arable farming is common throughout Norfolk, with cereal crops dominating the farmed landscape. Farm sizes range from less than five hectares (ha) to more than 100ha (Defra, 2020). Crops grown include cereals, 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.

64. Norfolk contains over 5% of the total agricultural sector in England (Norfolk Rural Development Strategy, 2013). It 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), the rural economy accounting for 44% of jobs in Norfolk.

65. 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.

19.6.2.2 Agricultural Land Classification

66. Agricultural land in England and Wales has been defined according to the ALC. The ALC 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 19-12**.

67. Agricultural land within the study area ranges from ALC Grade 2 to Grade 4, but primarily consists of ALC Grade 3 (see **Figure 19.4**).

68. ALC Grade 3 land can be split into Grades 3a and 3b. Grade 3a land is considered to fall within the Best and Most Versatile (BMV) agricultural land banding and is designated as a good quality agricultural land. Grade 3b is designated as of moderate quality agricultural land and is not included within the BMV banding. As Grade 3 land is not split within the ALC mapping, it is assumed all Grade 3 land within the study area could be Grade 3a.

69. The study area does not include any ALC Grade 1 or Grade 5 land.

70. The percentage of land of different ALC grades within the study area is presented in **Table 19-12**.

Table 19-12: ALC Grades within the Study Area

ALC Grade	Land comprised of ALC within study area (ha)	% ALC Grade land within the study area
1 (excellent quality agricultural land)	0	0
2 (very good quality agricultural land)	88	17
3 (undifferentiated) (moderate to good quality agricultural land)	393	77
4 (poor quality agricultural land)	18	3
5 (very poor-quality agricultural land)	0	0
Non-Agricultural	10	2

19.6.2.3 Soil Type

71. The National Soils Map (National Soil Resources Institute, undated) classification has been used to determine the types of soil that exist within the study area.

72. The soils within study area range from clays, loam and sands. The study area is dominated by deep loam soils in the north and deep sandy soils and seasonally wet deep loam to clay soils to the south. The soils around landfall primarily comprise shallow loam over chalk and smaller amounts of deep sandy soils. The soils around the onshore substation comprise deep loamy soils.

- 73. The soils within the study area 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 20.5**).
- 74. 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.
- 75. **Table 19-13** provides additional detail on the characteristics of the soil types found within the study area (Cranfield University, 2020).

Table 19-13: Soil Types within the Study Area

Soil Characteristics	Soil Description
Deep sandy	
Soilscapes definition	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.
General area within study area	Typically found between Cawston to Easton
% of the study area	28.01
Shallow loam over chalk	
Soilscapes definition	Shallow lime-rich soils over chalk or limestone
Texture	Loamy
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.
General area within study area	Typically found at Landfall
% of the study area	5.12
Deep loam	
Soilscapes definition	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.

Soil Characteristics	Soil Description
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.
General area within study area	Typically found between Bodham and Cawston
% of the study area	26.77
Seasonally wet deep peat to loam	
Soilscapes definition	Loamy and sandy soils with naturally high groundwater and a peaty surface.
Texture	Peat
Drainage	Naturally wet
Natural Fertility	Low to High
Typical Habitats	Wet meadows
Landcover	Mostly arable
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.
General area within study area	Typically found along River Bure at Saxthorpe
% of the study area	4.61
Peat	
Soilscapes definition	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.
General area within study area	Present at Attlebridge along the River Wensum
% of the study area	1.03
Deep loam	
Soilscapes definition	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.
General area within study area	Typically found between Easton and Great Melton and at the onshore substation.

Soil Characteristics	Soil Description
% of the study area	24.76
Seasonally wet deep loam to clay	
Soilscape definition	Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils
Texture	Loamy and clayey
Drainage	Impeded drainage
Natural Fertility	Moderate
Typical Habitats	Seasonally wet pastures and woodlands
Landcover	Grassland and arable, some woodland
General cropping	Mostly suited to grass production for dairy or beef; some cereal production often for feed. Timeliness of stocking and fieldwork is important, and wet ground conditions should be avoided at the beginning and end of the growing season to avoid damage to soil structure.
General area within study area	Typically found between Great Melton and Ketteringham
% of the study area	9.70
Seasonally wet deep sand	
Soilscape definition	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
General cropping	Cereals, roots, potatoes and field vegetables provided groundwater is controlled.
General area within study area	Typically found along rivers crossed by the study area
% of the study area	4.61

19.6.3 Recreation

19.6.3.1 Recreation in Norfolk

76. Norfolk is an attractive rural and coastal area which supports a thriving tourism industry providing a valuable leisure and recreation resource for residents and visitors alike (please see **Appendix 27.2 Socio-Economics and Tourism Technical Baseline** for more information on Tourism).
77. The Norfolk coast is characterised by a number of seaside towns, with beaches which attract many visitors. Further inland, Norfolk is home to a number of unique natural assets, attracting activities such as cycling, walking and heritage tourism.

78. 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 35km of the major urban centres such as Peterborough and Cambridge and within 100km of Milton Keynes and London.
79. 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.
80. The perception of Norfolk is that activities such as walking, using the beach, or enjoying the scenery have the greatest appeal. Therefore, recreational assets relating to outdoor activities can be considered more sensitive than those relating to indoor activities.

19.6.3.2 Onshore Recreational Assets

81. The study area crosses a number of beaches, coastal towns, long distance trails and PRow.

19.6.3.2.1 Coastline

82. Coastlines within the Norfolk region are characterised by historic villages, seaside resort villages and outstanding coastal countryside.
83. Within the study area, the key coastal recreational features located of the landfall areas surrounding Weybourne, as illustrated on **Figure 19.6**, include:
- Weybourne Beach is accessible via a public car park and comprises a steeply shelving pebbly beach. 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 launching leisure boats and swimming. A wreck between Kelling and Weybourne is a popular angling location.
 - Peddar’s Way and Norfolk Coast Path National Trail 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 village 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 access to the 100 Acre Woods.
- Muckleburgh Hill is a publicly accessible county wildlife site, composed of 21ha of remnant heathland falling within the North Norfolk AONB. The site provides grassland and semi-natural woodland mosaic.

Landfall is also located within the Norfolk Coast Area of Outstanding Natural Beauty (AONB). The AONB is an area designated by Natural England for conservation due to its significant landscape value. It stretches 90km and covers over 450km² of coastal and agricultural land. The AONB hosts many activities and attractions for visitors including walking, cycling, birdwatching, history and heritage, nature reserves and stargazing.

19.6.3.2.2 *Beaches*

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

19.6.3.2.3 *The Broads National Park*

85. The Broads National Park is Britain's largest protected wetland and an important visitor attraction for activities such as wildlife spotting, boating and scenic walks. The Broads National Park is located over 5.5km from the study area and therefore direct impacts upon the Broads would be avoided. Therefore, direct impacts to the Broads National Park have not been assessed as part of the recreational impact assessment within this chapter. However, it should be noted that the study area crosses several rivers that flow towards the Broads and indirect impacts may occur. These are detailed in **Chapter 18 Water Resources and Flood Risk**.

19.6.3.2.4 *National Trails and Long-Distance Paths*

86. 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.
87. The Peddars Way starts in Suffolk and joins with the Norfolk Coast Path at Holme-next-the-Sea. The Norfolk Coast Path section of the Peddars Way and Norfolk Coast Path National Trail crosses the study area at 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.
88. The Sea Palling to Weybourne section of the England Coast Path runs adjacent to the Peddars Way and Norfolk Coast Path and crosses the study area at the landfall.
89. A notable PRow which interacts with the study area is the Marriott's Way, which is a footpath and cycle route that runs between Aylsham and Norwich.

19.6.3.2.5 Public Rights of Way

90. The study area crosses numerous PRowWs including bridleways, footpaths and byways. Details of these crossings are provided in **Table 19-14** and shown on **Figure 19.7**. For a complete list of PRowW crossings, see **Crossing Schedule** (document no. 6.3.4.1).

Table 19-14: PRowW located within the Study Area

PRowW Type	No. of times crossed
Footpath	32
Bridleway	3
Open Byway	1
Restricted Byway	2

19.6.3.2.6 Cycle Routes

91. The study area crosses 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 shown on **Figure 19.7**.

19.6.3.2.7 Open Access and Common Land

92. Under the CRowW 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. Common land, however, is privately owned land which the public may access subject to certain defined restrictions.

93. There are no areas of open access or common land within the study area.

19.6.3.2.8 Dark Sky Areas

94. 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 study area are provided in **Table 19-15**.

Table 19-15: Dark Sky Discovery Partnership Sites Within Norfolk

Site name	Classification	Events	Proximity to study area (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 (Royal Society for the Protection of Birds)	34.75

Site name	Classification	Events	Proximity to study area (km)
Great Ellingham Recreational Ground	Milky Way Plus Events	BBC Star gazing and other open evenings	12.8

19.6.4 Climate Change and Natural Trends

- 95. The erosion of soil is a natural process that is expected to occur over time and is primarily controlled by 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.
- 96. 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 would be increased with 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.
- 97. 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. It could, however, 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.
- 98. The recreational demand is from UK visitors on day trips or short overnight trips as well as people who live locally to those recreational assets. 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.

19.7 Potential Impacts

19.7.1 Potential Impacts During Construction

19.7.1.1 Impact 1: Agricultural Drainage

- 99. 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. These systems, both natural and artificial, play an important role by ensuring soils remain aerated and reduce the risks associated with surface water flooding to the agricultural land itself and surrounding environment.
- 100. Existing field drains are expected to be made of ceramic or 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 18 Water Resources and Flood Risk**.

101. 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. Within each 400m length the extent of open trenches would typically be between 50-100m, with the trench being excavated at one end and backfilled at the other as works progress along each section.

102. During construction of the substation, any existing field drainage would be permanently impacted.

19.7.1.1.1 *Receptor Sensitivity*

103. 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.

19.7.1.1.2 *Magnitude of Effect – SEP or DEP in Isolation*

104. In relation to both onshore export cable installation and onshore substation, without mitigation the magnitude of effect on agricultural drainage is considered to be medium for either SEP or DEP in isolation. Agricultural drainage within an area >20ha would be temporarily unsuitable for agriculture during the construction phase.

19.7.1.1.3 *Magnitude of Effect – SEP and DEP*

105. A scenario where SEP and DEP are developed sequentially would represent the worst-case scenario for the impacts to drainage. Agricultural drainage would potentially be disrupted twice during the two installations of the onshore cable corridor and onshore substation. The installation of the onshore export cable sequentially is expected to take up to 24 months for each project.

106. In relation to both onshore export cable installation and onshore substation as sequential projects, the magnitude of the effect is considered to be medium without mitigation measures in place. Agricultural drainage within an area >20ha would be temporarily unsuitable for agriculture during the sequential construction phases.

19.7.1.1.4 *Impact Significance – All scenarios*

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

19.7.1.1.5 *Mitigation*

108. The Applicant will appoint an Agricultural Liaison Officer (ALO) and land drainage consultant to develop pre-and post-construction drainage plans.

109. Pre-construction drainage will be installed to manage water coming from existing underground land drainage pipes which will be affected by the installation of the new cables. Following installation of the cables, the post construction drainage program will commence to ensure that soils affected by the cable corridor are left in a condition that enables a return within the affected fields to full agricultural production. Where necessary post construction drains may be installed, typically parallel to the cable corridor.

110. In addition to the above, agricultural drainage systems elsewhere within the study area would be maintained during construction. Minor watercourses/ditches located within the study area would be subject to temporary damming and diversion during the construction phase to mitigate potential impacts. Installation of ducts 2m below the channel bed would be undertaken as part of the diversion process.

19.7.1.1.6 Residual Impacts – All scenarios

111. Introducing pre-construction drainage and reinstating land drainage as soon as reasonably practicable following the completion of the works reduces both the duration soil is unavailable and the amount of soil affected by poor drainage. Implementation of mitigation measures will aid in reducing the magnitude of effect to low. Taking this into account, for a receptor of medium sensitivity, a residual impact of **minor adverse** significance is expected which is considered not significant in EIA terms.

19.7.1.2 Impact 2: Temporary Loss of Land for Agriculture

112. The majority of the study area is located within areas currently associated with agricultural production. Construction activity within these areas would contribute to the temporary loss of agricultural land. Construction activities also have the potential to isolate land outside of the study area which would effectively take it out of agricultural use. This would result in the loss of growing seasons in the area affected with associated loss of agricultural related income.
113. Construction activities also have the potential to cause compaction of soil and hinder future agricultural productivity through the use of heavy machinery and disturbance.
114. Loss of agricultural land associated with the onshore substation is considered to be permanent, and as such, is assessed as an operational impact in **Section 19.7.2.2**.

19.7.1.2.1 Receptor Sensitivity

115. The quality of the agricultural land present within the study area primarily consists of ALC Grade 3 (77%), but also includes Grade 2 (17%) and Grade 4 (3%). As mentioned previously, all ALC Grade 3 is assumed within the study area to be Grade 3a and consequently included within the BMV banding. Therefore, the sensitivity of the receptor, in accordance with **Table 19-6**, is considered to be medium in order to reflect the dominance of ALC Grade 3 land.

19.7.1.2.2 Magnitude of Effect – SEP or DEP in Isolation

116. Based on the worst-case parameters set out in **Table 19-2**, the total construction footprint within agricultural land would be >20ha, over a period of 24 months for either SEP or DEP in isolation. Therefore, the magnitude of effect is considered to be medium.

19.7.1.2.3 Magnitude of Effect – SEP and DEP

117. A scenario where SEP and DEP are developed sequentially would represent the worst-case scenario for the temporary loss of land for agriculture.

In this scenario the total construction footprint within agricultural land would be >20ha for two separate periods of 26 and 22 months. Therefore, the magnitude of effect is considered to be medium.

19.7.1.2.4 Impact Significance – All scenarios

118. 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.

19.7.1.2.5 Mitigation Measures

119. As set out in **Table 19-3** the site selection process for SEP and DEP has sought to minimise land take and avoid wherever possible the likelihood of sterile land parcels resulting from construction activity within the study area. This has involved aligning the study area with field boundaries and utilising existing vehicle access tracks where possible.

During construction the working easement will be kept to a minimum and access to severed land for farm vehicles would be maintained using agreed crossing points with landowners and occupiers. Furthermore, an ALO will be appointed to assist with the appropriate planning and timings of works to minimise disruption to agricultural activities.

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

19.7.1.2.6 Residual Impact – All scenarios

121. With the proposed mitigation measures implemented during the construction phase, it is likely that the amount of land temporarily unsuitable for agriculture will be significantly reduced.
122. 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. As a result, the residual impact would remain at **moderate adverse** significance.

19.7.1.3 Impact 3: Soil Degradation and Loss of Soil to Erosion

123. There is the potential for soils to become compacted and for soil structure to deteriorate during construction works. Degradation is most likely to occur at temporary compound locations and along access routes where heavy materials and equipment are stored. Similarly, changes to the soil structure can affect local drainage (this is described in **Chapter 18 Water Resources and Flood Risk**). Deterioration of the soil structure can lead to reduced biological activity, water infiltration, soil porosity and permeability. Deterioration can also lead to an increased soil strength and risk of erosion (European Commission, 2008). These impacts can lead to reduced fertility and crop yields.

124. Soil quality can also be adversely affected by spills and leaks of contaminative materials. It can also be adversely affected by the drying and decomposition of peaty layers during stockpiling.
125. There is also the potential for soil erosion to occur during construction works, with some types of soils more susceptible to erosion than others. Additional factors that influence erosion include the soil texture, landscape, weather and land use.
126. Excavation, storage and reinstatement exposes the soils and creates an opportunity for erosion to occur. Loss of soil via erosion, may lead to a reduction in the quality of soils and therefore impact on the value of the agricultural land within the study area.
127. The following activities proposed during the onshore construction works have the potential to degrade and/or erode the existing soil resource:
 - Intrusive pre-construction surveys;
 - Removal of trees/vegetation;
 - Topsoil stripping and earthworks within the construction footprint;
 - Use of the haul roads and mobilisation areas; and
 - Stockpiling and reinstatement of soil.

19.7.1.3.1 *Receptor Sensitivity*

128. The soils in the study area are mostly loamy and clayey. Clayey soils have few sand grains and a lot of very small particles. Loamy soils have a mix of sand, silt and clay-sized particles and are therefore susceptible to compaction. The cohesive nature of loamy soils results in a low vulnerability in relation to erosion. They are also difficult to handle during wet periods using machinery without causing structural degradation. Given these characteristics, the soil resource within the study area is assigned a conservative value of medium sensitivity with respect to potential for degradation and/or erosion during the construction period.

19.7.1.3.2 *Magnitude of Effect – SEP or DEP in Isolation*

129. Soil within construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles. It is considered that >20ha of soil could be temporarily affected. Therefore, the magnitude of this potential effect, in accordance with **Table 19-7**, is considered to be medium.

19.7.1.3.3 *Magnitude of Effect – SEP and DEP*

130. A scenario where SEP and DEP are developed sequentially would represent the worst-case scenario for potential soil degradation and/or erosion.
131. In this scenario the total construction footprint within agricultural land would be >20ha for two separate periods of 24 months. The amounts of time construction traffic, heavy machinery and heavy materials spend on the site is therefore increased. The works would also require topsoil to be stripped and stored for two periods of 24 months until cable installation had been completed.

132. Soil within the construction areas would be subject to earthworks including initial stockpiling and movement between stockpiles. The total space required for soil storage is also greatest for the sequential scenario. The construction footprint is dominated by loamy and clayey soils, which have a relatively cohesive nature and so are susceptible to compaction but are considered to have low vulnerability in relation to erosion.
133. For this scenario, >20ha of soil could be temporarily affected, and as a result, the magnitude of this potential effect is considered to be medium.

19.7.1.3.4 *Impact Significance – All scenarios*

134. 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.

19.7.1.3.5 *Mitigation Measures*

135. 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 would be adopted. Additionally, guidance from the IES (2020) Sustainable, healthy, and resilient: Practice-based approaches to land and soil management would be used. Producing a Soil Management Plan (SMP) outlining the mitigation measures and best practise techniques, which contractors would be obliged to comply with. Measures would include:
- Consideration of weather conditions where it is appropriate to work for each soil type e.g. not working in an area of poorly draining soils following a period of heavy rain;
 - Storing soil appropriately;
 - Ensuring effective drainage systems are used during construction; and
 - Employing reinstatement and plant vegetation following completion of the construction works.
136. The SMP 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, wherever practicable;
 - Storing excavated subsoil separately from the topsoil, with sufficient separation to ensure segregation;
 - Restricting movements of heavy plant and vehicles to specified routes; and
 - Minimising the footprint of excavation works as much as reasonably possible.
 - Mitigation measures that will limit and/or prevent loss of soil to erosion would be included within the SMP.

19.7.1.3.6 *Residual Impact – All scenarios*

137. Impacts on the soil resource and additional mitigation is expected to reduce the amount of soil erosion and reduce the magnitude of effect. Although minimised through the mitigation measures outlined above remain the same.
138. A low magnitude effect, on a medium sensitivity receptor, reduces the residual impact of **minor adverse** significance.

19.7.1.4 **Impact 4: Impact to Agri-environment schemes**

139. 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.
140. The study area also crosses two Higher CSS agreements, and ten Middle CSS agreements.
141. The effect on landowners/occupiers with Agri-environment scheme agreements (including CSS) in place would depend on the extent and duration of construction works within land parcels managed, and the terms and conditions attached to the agreement in place.
142. In some instances, it has not be possible to avoid land managed under a agri-environment scheme, resulting in a landowner/occupier being potentially unable to meet the terms of an agreement. The level of impact could range from no impact, a minor and temporary change such as the need to make changes to grazing or cropping requirements or termination of the agreement. The impact on specific agreements will only be known once the landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.
143. The primary mitigation relating to Agri-environment schemes would be the avoidance of land parcels that are subject to agreements. This, however, has not been possible in some areas of the study area (e.g. area of the onshore substation). Where impacts to an agreement cannot be avoided, the affected landowners and /or occupier will be consulted to enable them to liaise with the Rural Payments Agency. This will include compensation provisions to reimburse a landowner and/or occupiers financial losses, where appropriate.
144. Following completion of the construction works for all scenarios, land will be reinstated to its original condition, and would therefore be available for management under an Agri-environment scheme in the future.
145. In general, it is considered that ecological losses associated with impacts to Agri-environment schemes would be mitigated through the types of mitigation set out in **Chapter 20 Onshore Ecology and Ornithology**.

19.7.1.5 Impact 5: Disruption to Existing Utilities

- 146. The majority of the identified utilities crossing the study area are for domestic services that include telecom, electricity, water, gas, sewage, an unspecified pipeline and street lighting. The study area will also cross buried high pressure gas pipelines on nine occasions (please see **Appendix 5.1 Crossing Schedule**).
- 147. The study area crosses the existing Sheringham Shoal OWF underground cable and passes close to Dudgeon OWF underground cables close to the landfall at Weybourne. The study area also crosses the proposed Norfolk Vanguard / Norfolk Boreas OWF underground cables and Hornsea Project Three OWF underground cables at Cawston and Weston Longville respectively. The study area would also cross the proposed Anglian Water Project pipeline(s) to the west of Hethersett.
- 148. SEP and DEP would undertake utility crossings in accordance with industry standard practice as agreed with the utility owners. Therefore, **no impacts** associated with existing utilities are anticipated under any of the construction scenarios.

19.7.1.6 Impact 6: Deterioration of Blue Flag Beaches

- 149. There is the potential that offshore construction activities associated with landfall (for example drilling) and nearshore works could lead to localised increases in the concentration of suspended sediment. Increases in suspended sediment concentrations may affect water quality at the nearest beaches.
- 150. Whilst compliance with the Bathing Waters Directive is not dependent on suspended sediment concentrations, the presence of a sediment plume during the bathing season would be undesirable.
- 151. Any suspended sediment plumes arising from construction works would be localised to within approximately 1km of the release location (refer to **Chapter 6 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 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 any change in bathing water quality. Therefore, there is considered to be **no impact** to Blue Flag beaches under any of the construction scenarios.

19.7.1.7 Impact 7: Disruption to onshore coastal recreational assets

- 152. The beach at Weybourne is primarily used for local recreational purposes, and maintaining access to the beach is an important element of local residents' quality of life.

19.7.1.7.1 Receptor Sensitivity

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

19.7.1.7.2 *Magnitude of Effect All scenarios*

- 154. A scenario where the SEP and DEP are developed sequentially would represent the worst-case scenario for potential disruption to users of Weybourne beach, however under all construction scenarios landfall works should not require closures to the beach for public access.
- 155. Some work activities would be required to be performed on the beach that may require short periods of restricted access (see **Chapter 4 Project Description** for details). For example, the installation of a temporary seawater pipe and pump to supply seawater to the onshore HDD temporary works compound for use with the drilling fluid, and the use of vehicles to transport the ducting across the beach during the landfall HDD works.
- 156. For the abovementioned activities the duration of restricted access would be up to one week and limited to the section of beach that is immediately adjacent to landfall. The magnitude of effect is assessed as negligible for all scenarios.

19.7.1.7.3 *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 which is considered not significant in EIA terms.

19.7.1.7.4 *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.

19.7.1.7.5 *Residual Impact*

- 159. For all construction scenarios, a residual impact of **negligible** significance is anticipated.

19.7.1.8 **Impact 8: 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, with visitors coming to enjoy natural assets such as the Norfolk Coast AONB and the rural character of the area.
- 161. The Norfolk Coast AONB is a significant inland tourism asset and both landfall and 5km of the onshore cable corridor are located within the AONB. The potential exists for both direct and indirect impacts to affect the designated area during construction works. Other key inland recreational assets include towns and villages and areas for wildlife spotting, boating and scenic walks.
- 162. Recreational routes (footpaths, cycle paths etc.) are considered separately (see **Impact 9**).
- 163. Potential impacts on inland recreational 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.

19.7.1.8.1 *Receptor Sensitivity*

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

19.7.1.8.2 *Magnitude of Effect All Scenarios*

165. During construction there would be the potential for air quality, noise, traffic and onshore and offshore visual disturbance associated with the works, potentially affecting users of inland recreational features. These have all been assessed in detail separately (refer to **Chapter 22 Air Quality**, **Chapter 23 Noise and Vibration**, **Chapter 24 Traffic and Transport**, **Chapter 25 Seascape Visual Impact**, **Chapter 26 Landscape and Visual Impact**, and **Impacts on the Qualities of Natural Beauty of Norfolk Coast Area of Outstanding Natural Beauty** (document reference 9.25), which conclude that impacts related to construction would not be significant. Whilst the sequential scenario would lead to potentially six years of construction presence, compared to three years for the single project or concurrent project scenarios, any reduction in the amenity value of inland recreational assets in the vicinity of onshore works would be short-lived and temporary under all scenarios. As such, the magnitude of effect is assessed to be low for all scenarios.

19.7.1.8.3 *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.

19.7.1.8.4 *Mitigation Measures*

167. Appropriate mitigation related to air quality, noise, traffic and visual impacts has been identified in **Chapter 22 Air Quality**, **Chapter 23 Noise and Vibration**, **Chapter 24 Traffic and Transport**, **Chapter 25 Seascape Visual Impact** and **Chapter 26 Landscape and Visual Impact**, to reduce potential impacts down to non-significant. These measures are secured within the OCoCP (document reference 9.17), outline Construction Traffic Management Plan (document reference 9.16) and Outline Landscape Management Plan (document reference 9.18) and Outline Ecological Management Plan (document reference 9.19) submitted with the DCO application.

19.7.1.8.5 *Residual Impact*

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

19.7.1.9 Impact 9: Disruption to users of Recreational Routes

169. The study area crosses numerous recreational routes such as PRowS (including bridleways, footpaths and byways), National Trails, and cycle paths, as shown on **Figure 19.7**. The study area interacts with a total of 38 recreational routes (as outlined in **Table 19-16** and further detailed in **Appendix 19.1**) including key routes such as the Marriott’s Way and Norfolk Coastal Path.

Table 19-16: Recreational Routes Crossed by Study Area

Recreational route type	No. of times crossed	Crossing type
PRow	28	6 x trenchless crossing 19 x open cut 3 x open cut/trenchless crossing
National Trails	1	Trenchless crossing
Cycle Routes	1	Trenchless crossing
Long distance walking routes	2	Trenchless crossing

170. Potential interactions with recreational routes are limited to works along the onshore cable corridor and at the onshore substation. The landfall works would not require any closures to the coastal path, although some activities may require brief periods of restricted access.

19.7.1.9.1 Receptor Sensitivity

171. 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 permissive paths not classified above are considered to be of local importance and as such are assessed to be low sensitivity receptors (see **Table 19-17**).

172. **Table 19-17** outlines the higher sensitivity recreational routes crossed by the study area. As a precautionary approach, the receptor sensitivity is assumed to be high to reflect the most sensitive receptor present.

Table 19-17: High sensitivity Recreational Routes within Study Area

PRow, Path or non-motorised route	Classification	Receptor Sensitivity
Peddars Way and Norfolk Coast Path	National Trail	High
Marriott’s Way / Sustrans National Cycle Network route 1	Sustrans National Route	High
Cross-Norfolk Trail / Marriott’s Way	Long Distance Walking Route	Medium

19.7.1.9.2 *Magnitude of effect SEP or DEP in Isolation*

173. The onshore cable duct would 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 (please see **Chapter 4 Project Description**). Where the cable corridor crosses any footpaths there would be a construction presence and open excavations. In the absence of mitigation this would prevent public access and in effect would represent a temporary closure until the works along that stretch of the cable corridor are complete. Whilst there would be no permanent closures, any temporary closure to a recreational route is assessed as an effect of medium magnitude.

19.7.1.9.3 *Magnitude of effect SEP and DEP*

174. SEP and DEP built sequentially would represent the worst-case scenario for this impact, due to the requirement for two temporary closures on each affected route, i.e. one closure for each project. Although the number of temporary closures would double under this scenario the overall effect is still temporary and short-term and still represents an effect of medium magnitude.

19.7.1.9.4 *Impact Significance All Scenarios*

175. For both SEP or DEP in isolation and SEP and DEP concurrently/sequentially the greatest magnitude arising from SEP and DEP is medium magnitude, on a high sensitivity receptor, representing an impact of **major adverse** significance.

19.7.1.9.5 *Mitigation Measures*

176. Disruption to any recreational routes would be managed to ensure continued safe access for members of the public, and all efforts would be made to minimise any closure durations. The exact management method would be agreed in advance with the relevant local authority for that stage of the works. Methods available include:

- Appropriately fenced (unmanned) crossing points;
- Manned crossing points; and
- Temporary alternative routes (assumed be required for approximately 1 week).

177. There would be no permanent closures of any recreational routes.

178. Soft management techniques would be employed where cycle routes intersect the onshore cable corridor. These methods would include (but not be limited to) the use of pilot vehicles and stop and go signs.

179. Safety measures would be implemented where the haul road crosses a footpath or cycle way, including raising awareness of the footpath or cycle way to construction workers and informing footpath and cycleway users of the hazards associated with the haul road. Where a recreational route is used as part of a construction access, an alternative route for the PRow would be provided.

180. After the completion of construction works, all recreational routes would be reinstated to their original condition or otherwise as agreed with the relevant local authority.

181. For all temporary alternative routes required, the following measures will be followed:
- A pre- and post-construction survey (including identification of surface condition and street furniture) of the route affected will be undertaken. Surveys will be undertaken by an experienced surveyor with scope of coverage and methodology to be agreed with the relevant local authority.
 - A qualified ALO will be employed to ensure that information on existing land conditions is obtained, recorded and verified during these surveys.
 - Where impacted by the works, the surveyed recreational route would be restored to its original condition or otherwise as agreed with the relevant local authority.
 - All alternative routes would be advertised following the local authority's standards for advertising temporary closures of route.

19.7.1.9.6 *Residual Impact*

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

19.7.2 Potential Impacts During Operation

19.7.2.1 Impact 1: Disruption to Field Drainage

183. SEP and DEP would 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 Internal Drainage Board (IDB) maintained watercourses, especially along the onshore cable corridor.
184. Permanent above ground infrastructure and hardstanding at the substation, as well as presence of buried cables have the potential to affect the field / land drainage during operation (see **Chapter 18 Water Resource and Flood Risk** for further detail).
185. Following installation of the cables, the post construction drainage program will commence. Field drainage along the onshore cable corridor would be reinstated to the level 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 would be fully reinstated and would have no operational use.
186. The backfilling of material, within both construction drainage channels and along the onshore cable corridor itself would prevent a conduit from forming and ensure there are no changes to the local flow rates due to permeability changes.
187. Whilst there would be a permanent change to the field drainage at the substation site during operation, this would be compliant with the Flood Risk Assessment (FRA) as presented in **Appendix 18.2** and would ensure that any water discharged from the substation into the surrounding drainage network would be at the existing greenfield runoff rate.

188. 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.

19.7.2.2 Impact 2: Permanent Loss of Land for Agriculture

189. The onshore export cables would be buried to a depth of at least 1.2m, ensuring that normal agricultural activities would be able to continue following completion of the construction works.
190. Link boxes are required in proximity (within 10m) to joint bays for routine maintenance along the cable corridor. They would not be required at all joint bay locations but as a worst-case it is assumed that they may be required up to a frequency of one every 1km.
191. Link boxes would be below ground and accessed via manhole covers at ground level. Where possible, the link boxes would be located close to field boundaries and in accessible locations. An above ground marker would be required to mark the location of each link box. The remaining land above each link box would be reinstated, however as a worst-case it is assumed that each link box would result in a permanent land take of 2m x 2m.
192. The footprint of the onshore substation and associated flood attenuation and landscaping would represent permanent land take for the duration of the operational phase.

19.7.2.2.1 Receptor Sensitivity

193. 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.
194. 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.

19.7.2.2.2 Magnitude of Effect for SEP and DEP in Isolation

195. The total permanent land take for the footprint of the onshore substation is approximately 16.93ha. SEP or DEP alone (3.25ha – onshore substation, 0.159ha flood storage area and 13.25ha landscaping area).
196. SEP and DEP in isolation would require the installation of up to 60 link boxes, located up to every 1km along the onshore cable corridor. It is proposed all link boxes would be located below ground with an above ground marker post at each location. This is not considered to represent a significant loss of agricultural land.
197. This equates to a permanent loss of less than 10ha of ALC grade 3 land (assumed to be Grade 3a BMV agricultural land). At a regional scale this represents a small proportion of the county resource. Therefore, the impact to agricultural productivity is considered to be an effect of low magnitude.

19.7.2.2.3 *Magnitude of Effect for SEP and DEP*

- 198. The total permanent land take for SEP and DEP (concurrently or sequentially) is approximately 19.54ha (6.0ha – onshore substation, 0.293ha flood storage area and 13.25ha landscaping area).
- 199. SEP and DEP (concurrently or sequentially) would require the installation of up to 120 link boxes located up to every 11m along the onshore cable corridor. As with SEP or DEP in isolation, it is proposed all link boxes would be located below ground with an above ground marker post at each location. This is not considered to represent a significant loss of agricultural land.
- 200. This is permanent loss of less than 10ha of ALC grade 3 land (assumed to be Grade 3a BMV agricultural land). At a regional scale, this represents a small proportion of the county resource. Therefore, the impact to agricultural productivity is still considered to be an effect of low magnitude.

19.7.2.2.4 *Impact Significance*

- 201. For both SEP and DEP in isolation and SEP and DEP concurrently or sequentially scenarios, prior to mitigation, the greatest magnitude of effect is low magnitude, on a high sensitivity receptor, which represents an impact of **moderate adverse** significance at a local level (<0.002% of the ALC grade 3 land in Norfolk County Council Boundary).

19.7.2.2.5 *Mitigation Measures*

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

19.7.2.2.6 *Residual Impact*

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

19.7.2.3 *Impact 3: Agri-environment Schemes*

- 204. The onshore substation, associated flood attention and landscaping areas are not located within a Agri-environment scheme area and so no impacts are anticipated within this area during the operational phase.
- 205. Following the construction phase, land associated with landfall and the onshore cable corridor that is located within Agri-environment schemes will be reinstated to its original condition. Therefore, there will be no impacts associated with the operation of SEP or DEP in isolation or SEP and DEP concurrently/sequentially during the operational phase.

19.7.2.4 Impact 4: Disruption to Existing Utilities

206. The majority of planned and emergency maintenance activities along the cable corridor would typically be undertaken at joint locations. The cables would be installed in ducts and sections can be removed at joint locations without the need for extensive excavations elsewhere along the corridor. There however remains the potential that some repair activities may be required to the ducts themselves that could require intrusive works between joint locations.
207. The majority of the identified utilities crossing the onshore cable corridor are for domestic services and include telecom, electricity, water, gas, sewage, unspecified pipeline and street lighting. The cable corridor also crosses nine buried high pressure gas pipelines (see [Appendix 4.1 Crossing Schedule](#)).
208. In addition, the cable corridor crosses the existing Sheringham Shoal OWF underground cable and passes close to Dudgeon OWF underground cable close to the landfall at Weybourne.
209. The proposed Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF underground cables cross the study area at Cawston and Weston Longville, respectively. Similarly, the proposed Anglian Water Project pipeline(s) will be crossed to the west of Hethersett.
210. SEP and DEP will undertake utility crossings in accordance with industry standard practice as agreed with the utility owners. The DCO application will also include protective provisions in favour of the utilities providers to provide protection for their assets. Therefore, **no impacts** associated with existing utilities are anticipated during operation both for SEP and DEP in isolation and SEP and DEP together.

19.7.2.5 Impact 5: Disruption to users of Recreational Routes

211. 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.
212. Any alternative routes proposed for the construction phase would be removed and the original routes reinstated post-construction. Gates will be installed during the operational phase of SEP and DEP where Stoke Holy Cross Bridleway 3 crosses the permanent onshore substation access road. It is anticipated that the road would be used for routine and ad hoc maintenance activities only. Therefore, **no impacts** are predicted during operation.

19.7.2.6 Impact 6: Soil Heating

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

214. The effects of soil heating are only likely to occur directly above the onshore cables. Based on the study of agricultural land, up to 9ha is potentially affected under the scenario involving SEP or DEP in isolation. 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 full 60km length of the onshore cable corridor. The potential impact of any potential soil heating on agricultural production may negatively affect crop growth.

19.7.2.6.1 *Receptor Sensitivity*

215. Given these characteristics, the soil resources within the study area 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 would be selected for its properties in this respect. It is therefore considered that the sensitivity of receptor is medium.

19.7.2.6.2 *Magnitude of Effect all Scenarios*

216. Heat dissipation modelling indicates that the soil temperature at the surface directly above the buried cables would be no higher than ambient temperature during operation. This is based on the maximum current rating requirements, which would only be possible within the final 10km of the cable corridor. Temperatures would increase as you approach the depth of the buried cables. Under a maximum current rating soil temperature would typically increase by 1°C for every 50mm of depth.

217. Any effect on soil heating would be highly localised to the area immediately surrounding the cable system. Where laid in trenches, cables would be buried at a minimum depth of 1.2m, with the principal root growth zone generally accepted to be within the first 50mm of the soil from the surface, where any increase in temperature would be less than 1°C.

218. For both SEP or DEP in isolation and SEP and DEP concurrently or sequentially, the results of the study indicate that the installation of the onshore cable will result in no change in the temperature at the ground surface, and very small increases in topsoil temperature (less than 1°C in the principal root growth zone). Overall, the magnitude of effect is therefore assessed as negligible.

19.7.2.6.3 *Impact Significance all scenarios*

219. For both SEP or DEP in isolation and SEP and DEP concurrently or sequentially, without mitigation, the magnitude of effect is negligible, on a receptor with a medium sensitivity, which represents an impact of **minor adverse** significance.

19.7.2.6.4 *Mitigation Measures*

220. No further mitigation is proposed.

19.7.2.6.5 *Residual Impact all scenarios*

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

19.7.3 Potential Impacts During Decommissioning

222. No decision has been made regarding the final decommissioning policy for the onshore export cables, as it is recognised that industry best practice, rules and legislation change over time. It is likely that the cables would be pulled through the ducts and removed, with the ducts themselves left in situ.
223. 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.
224. In relation to the 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 lifetime of SEP and DEP, but are expected to include:
- Dismantling and removal of outside electrical equipment from site located outside of the substation(s) buildings;
 - Removal of cabling from site;
 - Dismantling and removal of electrical equipment from within the substation(s) buildings;
 - Removal of main substation(s) building and minor services equipment;
 - Demolition of support buildings and removal of fencing;
 - Landscaping and reinstatement of the site (including land drainage); and
 - Removal of areas of hard standing.
225. Whilst details regarding the decommissioning of the substation are currently unknown, considering a worst-case scenario, which would be the removal and reinstatement of the current land use, it is anticipated that the impacts would be similar or less than those during construction.

19.8 Cumulative Impacts

19.8.1 Identification of Potential Cumulative Impacts

226. The first step in the cumulative assessment is the identification of which residual impacts assessed for SEP and/or DEP 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 19-18** below. Only potential impacts assessed in **Section 19.7** 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).

227. In relation to Land Use, Agriculture and Recreation all potential cumulative impacts, effects would be highly localised to within the DCO order limits, therefore given the distances to other projects and limited potential of temporal overlap, there would be limited cumulative impacts. The potential for Cumulative Impact and rationale is presented in **Table 19-18**.

Table 19-18: 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).
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.
Impact 3: Soil Degradation and 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.
Impact 4: Impact to Agri-environment Schemes	Yes	Impacts may occur where project boundaries overlap spatially or temporally on land subject to the same CSS. Such impacts have the potential to affect land under CSS (e.g. loss of earnings from CSS or failure to achieve environmental objectives).
Impact 5: Disruption to Existing Utilities	No	Potentially affected utility providers would be contacted and the location of existing services would be identified prior to the commencement of construction works to ensure there would be no impact.
Impact 6: Deterioration of Blue Flag Beaches	Yes	The project will not have a direct impact on Blue Flag beaches, however indirect impacts may occur as a result of construction works and have been included within the CIA.
Impact 7: Disruption to Onshore Coastal Recreational Assets	Yes	Considered to have negligible direct impacts during the construction phase, particularly with Hornsea Project Three at landfall.
Impact 8: Disruption to users of Inland Recreational Assets	Yes	Cumulative impacts may occur depending on the timing of works relative to other projects. The sequential construction scenario would increase the likelihood of cumulative impacts.
Impact 9: Obstruction to Users of Recreational Routes	Yes	Cumulative impacts may occur depending on the timing of works relative to other projects.

Impact	Potential for Cumulative Impact	Rationale
		In particular cumulative impacts to recreational routes may occur as a result of other OWF cable corridors in the surrounding area. The sequential construction scenario would increase the likelihood of cumulative impacts.
Operational		
Impact 1: Disruption to Field Drainage	No	Considered to have no direct impact, therefore it is not taken forward.
Impact 2: Permanent Loss of land for agriculture	Yes	Cumulative impacts may occur at both a local and/or county scale where impacts to productivity affect the agriculture industry.
Impact 3: Agri-environment Schemes	No	No Agri-environment schemes are located within areas associated with permanent above ground infrastructure (onshore substation, flood attenuation and landscaping areas). Following completion of works, land located within Agri-environment schemes will be reinstated and so the no cumulative impacts are thought to exist. Therefore, it has not been taken forward.
Impact 4: Disruption to Existing 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.
Impact 5: Disruption to users of Recreational Routes	No	Considered to have no direct impact, therefore it is not taken forward.
Impact 6: Soil Heating	No	Considered to have no direct impact, therefore it is not taken forward.
Decommissioning		
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would be provided. As such, cumulative impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.		

19.8.2 Other Plans, Projects and Activities

228. 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 19-19** below, together with a consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to SEP and DEP, status of available data and rationale for including or excluding from the assessment.

229. 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 SEP and DEP. 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 19-19: 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 study area (km)	Distance from the Export Cable corridor (km)	Confidence in Data	Included in the CIA (Y/N)	Rationale
Norfolk Vanguard OWF	DCO Consented	2023-2029	0km - SEP and DEP onshore cable corridor crosses the Norfolk Vanguard onshore cable corridor.	0km	High	Y	Overlapping project boundaries may result in impacts of a direct and / or indirect nature during construction and operation.
Hornsea Project Three OWF	DCO consented	2023-2025 (single phase) 2023-2031 (two phase)	0km - SEP and DEP onshore cable corridor crosses the proposed Hornsea Three onshore cable corridor.	0km	High	Y	Overlapping project boundaries may result in impacts of a direct and / or indirect nature during construction and operation.
Norfolk Boreas OWF	DCO Consented	2023-2029	0km – SEP and DEP onshore cable corridor crosses the Norfolk Boreas onshore cable corridor.	0km	High	Y	Overlapping project boundaries may result in impacts of a direct and / or indirect nature.
A47 North Tuddenham to Easton	DCO examination	2022/23-2024/25	0km – A47 crosses the onshore cable corridor of SEP and DEP.	0km	High	Y	Overlapping proposed project boundaries at Easton may result in impacts of a direct and / or indirect nature during construction.

Project	Status	Construction Period	Closest Distance from the study area (km)	Distance from the Export Cable corridor (km)	Confidence in Data	Included in the CIA (Y/N)	Rationale
Proposed Norwich WesternLink road (NWL)	Scoping opinion given	2023	0km – NWL crosses the onshore cable corridor of SEP and DEP.	0km	High	Y	Overlapping proposed project boundaries may result in impacts of a direct and / or indirect nature during construction.
East Anglia GREEN	Site selection / pre-scoping	2027-2031	NA	NA	Low	N	Screened out as insufficient details available about this proposal to undertake any meaningful cumulative impact assessment.

19.8.3 Assessment of Cumulative Impacts

230. Having established the residual impacts from SEP and/or DEP 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.

19.8.3.1 Cumulative Impact during Construction 1: Agricultural Drainage

231. Following the proposed mitigation outlined in **Section 19.3.3**, the residual impact for SEP or DEP in isolation is assessed as **negligible**, and the residual impact for SEP and DEP concurrently or sequentially is assessed as **minor adverse** significance.
232. Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF underground cables run through the study area at Cawston and Weston Longville respectively. The A47 project and proposed NWL project will cross the SEP and DEP onshore cable corridor to the west of the village of Easton and to the east of the village of Western Green respectively.
233. Due to geographical overlap between these projects there is the potential for direct cumulative impacts upon drainage systems during construction.
234. Potential impacts related to construction works are those associated with intrusive groundworks associated with the projects identified above. The extent of any impact would 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 restricted 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. This represents an impact of **moderate adverse** significance, albeit limited to small areas where the projects overlap.
235. Both SEP and DEP and the additional projects identified have however committed to mitigation strategies which seek to avoid, reduce or offset the effects of direct impacts upon drainage. Hornsea Project Three OWF 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 (Ørsted, 2018). Norfolk Boreas and Norfolk Vanguard OWFs have outlined (Norfolk Vanguard Limited, 2018) similar strategies but also include the appointment of a specialist drainage contractor to locate and draw plans of the existing drainage systems, develop a pre-construction Drainage Plan and to install cables at a depth where they would be positioned below the level of typical field drainage pipes to minimise impacts and interaction.
236. With the implementation of these measures for each project, the cumulative magnitude of effect would reduce to low, representing a residual cumulative impact of **minor adverse** significance for all construction scenarios. No additional mitigation is proposed over and above that set out for the construction impacts (**Section 19.7.1.1**).

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

Following the proposed mitigation outlined in **Sections 19.3.3** and **19.7.1.2.5**, the residual impact for all SEP and DEP scenarios is considered to be of **moderate adverse** significance due to the temporary loss of land for agriculture.

237. Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF underground cables run through the study area at Cawston and Weston Longville respectively. The A47 project and proposed NWL project will cross the SEP and DEP onshore cable corridor to the west of the village of Easton and to the east of the village of Western Green respectively.
238. Due to geographical overlap between these projects there is the potential for direct cumulative impacts associated with a loss of agricultural land to occur during the construction phase. Indirect impacts, associated with land parcels becoming disconnected, may also occur during the construction phase of each project.
239. With the exception of agricultural land lost at the onshore substation site for SEP and DEP (inclusive of the flood attenuation and landscaping areas), cumulative adverse effects would be temporary in nature.
240. In relation to the A47 North Tuddenham to Easton project and the proposed NWL project, there would be a permanent loss of agricultural land in areas where the roads cross the SEP and DEP onshore cable corridor. Where there is an overlap between SEP and DEP and the A47 North Tuddenham to Easton project, Highways England have committed to returning land to its former use following completion of construction works. An EIA has yet to be produced for the NWL project. A scoping report for the project, submitted in 2020, indicated that mitigation measures would be secured for the project via a Construction Environmental Management Plan (CEMP).
241. Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF have also committed to the reinstatement of land to its previous condition following the completion of construction works. Commitments have also been made by SEP and DEP, Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF to maintaining access to parcels of agricultural land that may become isolated during the construction works.
242. Following the completion of the construction phase for each of the identified projects and implementation of mitigation measures to restore land to its previous use, the predicted cumulative impact significance to **minor adverse** during the construction phase.

19.8.3.3 Cumulative Impact During Construction 3: Soil Degradation and Loss of Soil to Erosion

243. Following the proposed mitigation outlined in **Section 19.7.1.3**, the residual impact for SEP or DEP in isolation is assessed as **negligible**, and the residual impact for SEP and DEP concurrently or sequentially is assessed as **minor adverse** significance.

244. Norfolk Vanguard / Norfolk Boreas OWF and Hornsea Project Three OWF underground cables run through the study area at Cawston and Weston Longville respectively. The A47 project and proposed NWL project will cross the SEP and DEP onshore cable corridor to the west of the village of Easton and to the east of the village of Western Green respectively.
245. The SEP and DEP cable corridor are typically underlain by either loamy and clayey soils (low sensitivity) or sandy soils (medium sensitivity). Sandy soils have moderate vulnerability to erosion and, taking the worst-case scenario, the sensitivity of the soils to erosion is considered to be medium.
246. Due to geographical overlap between the projects, there is the potential for direct cumulative impacts associated with soil degradation and erosion to occur during the construction phases of each project.
247. Norfolk Vanguard / Norfolk Boreas OWF, Hornsea Project Three OWF and the A47 North Tuddenham to Easton Road scheme have committed to mitigation measures to reduce potential impacts associated with soil degradation and soil erosion during the construction phase. These commitments include development of soil management plans, soil resource plans and soil handling strategies. As mentioned previously, an EIA has yet to be produced for the NWL project and so comments on the proposed mitigation measures cannot be made at this stage. It is, however anticipated that best practice and appropriate mitigation measures will be implemented within the project, therefore reducing the potential for cumulative impacts to occur.
248. The implementation of these methods will ensure that soils are treated appropriately and reinstated in a manner that would not result in a reduction in quality. Construction traffic and machinery are to be confined to designated routes to further reduce compaction of soils.
249. Following the completion of the construction phase for each of the identified projects and implementation of mitigation measures to prevent soil degradation and erosion, the impact significance is considered to be no higher than that assessed for SEP and DEP, i.e. **minor adverse**. No additional mitigation is proposed.

19.8.3.4 Cumulative Impact During Construction 4: Impacts to Agri-environment Schemes

250. Following the proposed mitigation outlined in **Section 19.7.1.4**, the level of cumulative impact from SEP and DEP for all scenarios, the residual impacts could range from no impact, a minor and temporary change such as the need to make changes to grazing or cropping requirements of the termination of the agreement.
251. At the point where the SEP and DEP onshore cables would interact with the cables from the Norfolk Vanguard / Norfolk Boreas OWF there is no land under CSS. There is land classified under CSS (Middle Tier) that could be impacted where the SEP and DEP onshore cables would interact with the cables from Hornsea Project Three OWF and the A47 and NWL road schemes.

252. Proposed mitigation measures in relation to impacts to CSS associated with Hornsea Project Three and the A47 North Tuddenham to Easton Scheme are not outlined within their respective Environmental Statements and an EIA has not yet been produced for the NWL project. However, predictive impacts are thought to remain as ranging from no impact, a minor and temporary change such as the need to make changes to grazing or cropping requirements of the termination of the agreement. The impact on specific agreements will only be known once landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.

19.8.3.5 Cumulative Impact During Construction 5: Disruption to Users of Inland Recreational Assets

253. With the mitigation proposed in **Section 19.7.1.8** impacts to users of inland recreational assets are of **negligible** significance for all SEP and DEP scenarios.

254. Interactions between recreational assets occur at landfall for SEP and DEP and Hornsea Project Three. At landfall, SEP and DEP and Hornsea Project Three are located within the Norfolk AONB.

255. SEP and DEP as well as Hornsea Project Three have committed to the implementation of traffic management measures (for SEP and DEP see **Chapter 24 Traffic and Transport** for details) to ensure that safe and effective access to the coast and other key recreational assets is maintained for visitors and the local communities. Cumulative noise impacts (for SEP and DEP see **Chapter 23 Noise and Vibration**) and nuisance from dust (for SEP and DEP see **Chapter 22 Air Quality**) during construction have also been assessed, however no significant cumulative impacts have been identified.

256. Cumulative impacts to recreation assets at landfall are assessed to be negligible magnitude and the sensitivity of affected receptors is assessed to be high, which represents an impact of **minor adverse** significance, i.e. no higher than that assessed for SEP and DEP alone. No additional mitigation is proposed.

19.8.3.6 Cumulative Impact During Construction 6: Disruption to Users of Recreational Routes

257. The proposed mitigation in **Section 19.7.1.9**, reduces residual impacts to affected recreational routes to no greater than **minor adverse** significance for all SEP and DEP scenarios.

258. SEP and DEP and Hornsea Project Three both cross the following Recreational Routes:

- Norfolk Coastal Path;
- Marriott's Way; and
- Swardeston BR12.

259. Although trenchless crossing methods will be used to cross the Norfolk Coastal Path as part of SEP and DEP, access restrictions may be required during the short term. Should short term closures also be required for Hornsea Project Three then this may result in a cumulative impact on the Norfolk Coastal Path, albeit temporary.

- 260. Marriott's Way is to be crossed using trenchless methods and so no cumulative impacts are anticipated. Should trenchless methods be used to cross Swardeston BR12, no cumulative impacts are anticipated, however should open cut methods be utilised, there is the potential for short term cumulative impacts (e.g. PRoW diversion) to occur.
- 261. No other interactions have been identified between SEP and DEP and the other CIA projects in relation to recreational routes.
- 262. Mitigation measures proposed by Hornsea Project Three include the development and implementation of a PRoW management plan. The management plan would sit within the project's CoCP and be agreed with the local authority. PRoW located within the Hornsea Project Three limits will be crossed using similar techniques to those of SEP and DEP to reduce potential disruption.
- 263. Cumulative impacts to recreational routes would be short term and temporary, lasting for the duration of works at each crossing point only. Cumulative impacts between SEP and DEP and Hornsea Project Three would not represent an increase in the magnitude of effect assessed for SEP and DEP.
- 264. Therefore, cumulative residual potential impacts to recreational routes are anticipated to remain no greater than **minor adverse** significance.

19.8.3.7 Cumulative Impact During Operation 1: Permanent Loss of Land for Agriculture

- 265. Permanent loss of agricultural land will occur within the onshore substation, flood attenuation and landscaping areas of SEP and DEP for all scenarios. Within the onshore substation area of SEP and DEP, there is the potential for interaction with the onshore substation infrastructure of Hornsea Project Three which is to be located within close proximity. Permanent loss of agriculture land during operation will occur where the A47 North Tuddenham to Easton and NWL road schemes cross the SEP and DEP onshore cable corridor.
- 266. Permanent loss of agricultural land as a result of interactions with Norfolk Vanguard / Norfolk Boreas OWF is not anticipated to occur. If however, permanent above ground infrastructure is located within the cross over points of the onshore cable corridors (e.g. above ground link boxes), then there is the potential for a permanent loss of agricultural land within these areas.
- 267. Due to the potential for an increased area of permanent loss of agricultural land to occur, there is the potential for cumulative impacts to be present which may be greater than SEP and DEP alone. The predicted cumulative impact significance during operation may represent a **moderate adverse** significance. Additional mitigation measures may be required, including an agricultural survey to determine whether the land associated with the onshore substations is Grade 3a or 3b i.e. is the land included within the BMV banding which would increase its sensitivity. If it is determined the land is Grade 3b, and so not within the BMV banding, the impact significance may be reduced to **minor adverse**.

19.8.3.8 Cumulative Impact During Operation 2: Impact to Agri-environmental schemes

- 268. Landfall for SEP and DEP interacts with the landfall area of Hornsea Project Three, both of which are located on land under Middle Tier CSS. This interaction extends through an area of the onshore cable corridors located directly south of the landfall locations.
- 269. There is also interaction between the onshore cable corridor of SEP and DEP, Hornsea Project Tree, Norfolk Vanguard / Norfolk Boreas OWF onshore cables and the A47 North Tuddenham to Easton and NWL projects in areas of Middle and High Tier CSS.
- 270. Following construction, with the exception of the NWL project, all projects have committed to restoring land to its previous condition. It is anticipated that the mitigation measures associated with the NWL project will seek to limit the potential impacts to Agri-environmental schemes. Therefore, land has the potential to remain suitable for Agri-environment schemes. The resulting cumulative impact is considered to be of **negligible** significance.

19.9 Transboundary Impacts

- 271. 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.

19.10 Inter-relationships

- 272. **Table 19-20** lists the parameters or ‘sources’ that are considered to interact with receptors identified in this chapter.

Table 19-20: Land Use, Agriculture and Recreation Inter-relationships

Impact / receptor	Related Chapter	Where Addressed in this Chapter	Rationale
Construction			
Impact 1: Agricultural Drainage	Chapter 18 Water Resources and Flood Risk	19.7.1.1	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies.
Impact 2: Temporary Loss of Land for Agriculture	Chapter 20 Onshore Ecology	19.6.1.3 19.7.1.4 19.7.1.9	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.
Impact 3: Soil Degradation and Loss of Soil to Erosion	Chapter 20 Onshore Ecology	19.6.1.3 19.7.1.4 19.7.1.9	Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or

Impact / receptor	Related Chapter	Where Addressed in this Chapter	Rationale
	<p>Chapter 17 Onshore Ground Conditions and Contamination</p>	<p>19.4.1 19.6.2.2</p>	<p>the loss of agricultural land.</p> <p>Changes in soil quality could impact on ground conditions and potential contaminated land.</p>
<p>Impact 4: Impacts to Agri-environment Schemes</p>	<p>Chapter 20 Onshore Ecology</p>	<p>19.6.1.3 19.7.1.4 19.7.1.9</p>	<p>Changes to land uses could impact on ecological receptors for example the removal of trees or hedgerows or the loss of agricultural land.</p>
<p>Impact 6: Deterioration of Blue Flag Beaches</p>	<p>Chapter 27 Socio-Economics</p>	<p>19.6.3.1</p>	<p>The project may affect local businesses in the tourism and recreation industry.</p>
<p>Impact 7: Disruption to Onshore Coastal Recreational Assets</p>	<p>Chapter 27 Socio-Economics</p>	<p>19.6.3.1</p>	<p>The project may affect local businesses in the tourism and recreation industry.</p>
<p>Impact 8: Disruption to users of Inland Recreational Assets</p>	<p>Chapter 24 Traffic and Transport</p>	<p>19.7.1.7</p>	<p>Changes in land uses e.g. at roads or paths could affect traffic and transport.</p> <p>The impacts of construction traffic may affect access for local communities and tourists.</p>
	<p>Chapter 27 Socio-Economics</p>	<p>19.6.3.1</p>	<p>The project may affect local businesses in the tourism and recreation industry.</p>
<p>Impact 9: Obstruction to Users of Recreational Routes</p>	<p>Chapter 24 Traffic and Transport</p>	<p>19.7.1.7</p>	<p>Changes in land uses e.g. at roads or paths could affect traffic and transport.</p> <p>The impacts of construction traffic may affect access for local communities and tourists.</p>
	<p>Chapter 27 Socio-Economics</p>	<p>19.6.3.1</p>	<p>The project may affect local businesses in the tourism and recreation industry.</p>
<p>Operation</p>			

Impact / receptor	Related Chapter	Where Addressed in this Chapter	Rationale
Impact 1: Agricultural Drainage	Chapter 18 Water Resources and Flood Risk	19.7.2	Potential impacts on drainage could lead to changes in flood risk or water resources e.g. private water supplies
Impact 5: Disruption to users of Recreational Routes	Chapter 26 Landscape and Visual Impact Assessment	19.7.2.2	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.

19.11 Interactions

273. 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 19-21**. This provides a screening tool for which impacts have the potential to interact. **Table 19-22** provides an assessment for each receptor (or receptor group) as related to these impacts.
274. Within **Table 19-22** the impacts are assessed relative to each development phase (Phase assessment, 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.
275. 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 19-21: Interaction between Impacts - Screening

Potential Interactions between Impacts									
Construction									
	Impact 1: Agricultural Drainage	Impact 2: Temporary Loss of land for agriculture	Impact 3: Soil Degradation and Loss of Soil to Erosion	Impact 4: Impact to Agri- environment Schemes	Impact 5: Disruption to Existing Utilities	Impact 6: Deterioration of Blue Flag Beaches	Impact 7: Disruption to Onshore Coastal Recreational Assets	Impact 8: Disruption to users of Inland Recreational Assets	Impact 9: Obstruction to Users of Recreational Routes
Impact 1: Agricultural Drainage	-	Y	Y	Y	N	N	N	N	N
Impact 2: Temporary loss of land for agriculture	Y	-	Y	Y	Y	N	N	N	N
Impact 3: Soil Degradation and loss of soil to erosion	Y	Y	-	Y	Y	N	N	N	N
Impact 4: Impact to Agri- environment Schemes	Y	Y	Y	-	Y	N	N	N	N
Impact 5: Disruption to Existing Utilities	N	Y	Y	Y	-	N	N	N	N
Impact 6: Deterioration of Blue Flag Beaches	N	N	N	N	N	-	Y	Y	Y
Impact 7: Disruption to Onshore Coastal Recreational Assets	N	N	N	N	N	Y	-	Y	N
Impact 8: Disruption to users of Inland Recreational Assets	N	N	N	N	N	Y	Y	-	Y
Impact 9: Obstruction to Users of Recreational Routes	N	N	N	N	N	Y	N	Y	-
Operation									
	Impact 1: Disruption to Field Drainage	Impact 2: Permanent Loss of land for agriculture	Impact 3: Agri- environment Schemes	Impact 4: Disruption to Existing Utilities	Impact 5: Disruption to users of Recreational Routes	Impact 6: Soil Heating			
Impact 1: Disruption to Field Drainage	-	Y	Y	N	N	N			

Impact 2: Permanent Loss of land for agriculture	Y	-	Y	Y	N	N			
Impact 3: Agri-environment Schemes	Y	Y	-	N	N	N			
Impact 4: Disruption to Existing Utilities	N	Y	N	-	N	N			
Impact 5: Disruption to users of Recreational Routes	N	N	N	N	-	N			
Impact 6: Soil Heating	N	N	N	N	N	-			

Table 19-22: Interaction between Impacts – Phase and Lifetime Assessment

Receptor	Highest Significance Level			Phase Assessment	Lifetime Assessment
	Construction	Operation	Decommissioning		
Soil	Moderate adverse	Minor adverse	Moderate adverse	No greater than individually assessed impact Impacts to soils (degradation and erosion) 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 no to minor and that each impact would 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 within the study area will occur during the construction phase of SEP and DEP (all scenarios). Soil would be reinstated following construction where possible, restoring the area to its original condition. The impacts to soil during the life of the onshore project substation are negligible. It is therefore anticipated that there are no lifetime effects for receptors.
Recreational assets	Minor adverse	Minor adverse	Minor adverse	No greater than individually assessed impact The impacts to recreational assets 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 no to minor and that each impact would 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 the construction phase. Impacts associated with the operational phase would be restricted to times of routine or ad hoc inspection and maintenance, which are transient and temporary in nature. It is therefore anticipated that 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 to paths and routes 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 no to minor and that each impact would 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 There would be limited impact to paths and common land during the construction phase of SEP and DEP. There would be no permanent closure of paths or routes during the operational phase of SEP and DEP. It is therefore anticipated that there are no lifetime effects for receptors.

19.12 Potential Monitoring Requirements

276. Monitoring is proposed for land use, agriculture and recreation via the **Outline Landscape Management Plan** (OLMP) (document reference 9.18)

19.13 Assessment Summary

277. 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 would 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 SEP and DEP.
278. A summary of the potential impacts identified in relation to land use, agriculture and recreation is presented in **Table 19-23**.
279. 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 3 land) and land subject to CSS. 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 impacts on identified receptors would result in a negative impact to the study area.
280. During operation, the impacts to land use, agriculture and recreation are limited. This is because the onshore cable is buried. However, residual impacts to changes in land use during operation are no greater than a **minor adverse** significance in isolation. Cumulatively, impacts to agricultural land use may be **moderate adverse**, should land be determined to be Grade 3a. Private agreements would be sought with the relevant landowners/occupiers regarding any permanent loss of land incurred. Routine and ad hoc maintenance activities of recreational routes 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.
281. The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. As such, impacts during the decommissioning stage are assumed to be the same as those identified during the construction stage.
282. Where significant impacts have been assessed, they are localised and work would be undertaken to mitigate the impacts down to an acceptable level.

Table 19-23: 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						
Impact 1: Agricultural Drainage	Field drainage network	Medium	Medium	Moderate adverse	Maintaining / reinstating land drainage systems; provision of an ALO and local specialised drainage contractor; implementation of the final Code of Construction Practice (CoCP) and SMP	Minor adverse
Impact 2: Temporary Loss of land for agriculture	Agricultural land	Medium	Medium	Moderate adverse	Landowner consultation; maintain access for farm vehicles; Plan timing of works; Private agreements	Moderate adverse
Impact 3: Soil Degradation and Loss of Soil to Erosion	Agricultural soils	Medium	Medium	Moderate adverse	Topsoil stripping; appropriate storage and handling of soils according to their characteristics and in appropriate weather conditions; Restrict movements of heavy plant vehicles; Minimising the excavation footprint; SMP; construction method statements for soil handling; private agreements	Minor adverse
Impact 4: Impact to Agri-environment Schemes	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 DCO order limit has been established, and landowner agreements are in place, confirming the extent and duration of impacts to specific land parcels.				
Impact 5: Disruption to Existing Utilities	Utilities	No impact	No impact	No impact	No impact	No impact
Impact 6: Deterioration of Blue Flag Beaches	Blue Flag beaches	Low	No impact	No impact	No additional mitigation is required.	No impact

Potential impact	Receptor	Sensitivity	Magnitude	Pre-Mitigation Impact	Mitigation Measures Proposed	Residual Impact
Impact 7: Disruption to Onshore Coastal Recreational Assets	Users of onshore coastal recreational assets	Low	Negligible	Negligible adverse	Any areas subject to short-term restricted access would be agreed in advance	No impact
Impact 8: Disruption to users of Inland Recreational Assets	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
Impact 9: Disruption to Users of Recreational Routes	Users of Recreational Routes	Medium	Medium	Moderate	Appropriately fenced (unmanned) crossing points; Manned crossing points; and Temporary alternative routes (assumed be required for approximately 1 week).	Minor adverse
Operation						
Impact 1: Disruption to Field Drainage	Field drainage network	Medium	Negligible	Minor adverse	No impact	Minor adverse
Impact 2: Permanent Loss of land for agriculture	Agricultural land	High	Low	Moderate adverse	Private agreements would be sought with the relevant landowners / occupiers regarding any permanent loss of land incurred.	Moderate adverse
Impact 3: Agri-environment Schemes	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 no impact to the termination of an agreement,. The impact on specific agreements will only be known once the final DCO order limit has been established, and landowner agreements are in place, confirming the extent and duration of impacts to the onshore substation land parcels.				
Impact 4: Disruption to Existing Utilities	Utilities	High	No impact	No impact	No additional mitigation is required.	No impact
Impact 5: Disruption to users of Recreational Routes	Closure of Recreational Routes	Medium	No impact	No impact	Pre-construction surveys. Management Plans	No impact

Potential impact	Receptor	Sensitivity	Magnitude	Pre-Mitigation Impact	Mitigation Measures Proposed	Residual Impact
Impact 6: Soil Heating	Agricultural soils	Medium	Negligible	Minor adverse	No additional mitigation is required.	Minor adverse
Decommissioning						
The detail and scope of the decommissioning works would be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A Decommissioning Plan would 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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