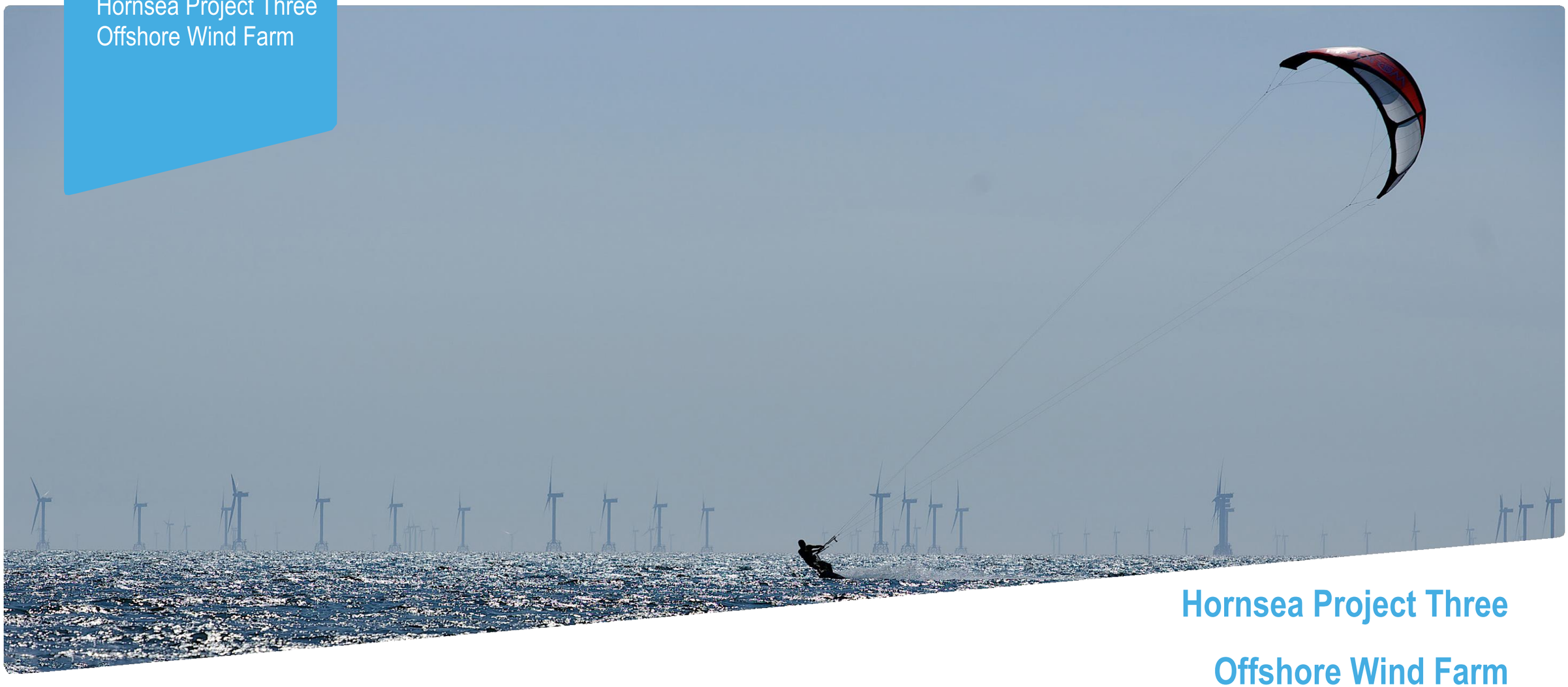
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Environmental Statement:
Volume 3, Chapter 6 - Land Use and Recreation

PINS Document Reference: A6.3.6
APFP Regulation 5(2)(a)

Date: May 2018

Hornsea 3
Offshore Wind Farm

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Environmental Impact Assessment

Environmental Statement

Volume 3

Chapter 6 - Land Use and Recreation

Liability

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Report Number: A6.3.6

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Date: May 2018

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Front cover picture: Kite surfer near a UK offshore wind farm © Orsted Hornsea Project Three (UK) Ltd., 2018.

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Table of Contents

List of Tables

List of Figures

List of Annexes

Glossary

Term	Definition
Agri-environment scheme	A government-funded scheme to encourage farmers to manage their land in an environmentally friendly way.
Alluvium	Unconsolidated (not cemented together into a solid rock) soil or sediment, which has been eroded, reshaped by water in some form, and redeposited in a non-marine setting.
Auger boring	A core of soil taken for examination to a depth of 1 m with a Dutch Combination hand auger.
"best and most versatile" Land	The highest quality Grades 1, 2 and 3a agricultural land as determined by Defra.
Calcareous	Containing lime or being chalky.
Drift deposit	Unconsolidated (not cemented together into a solid rock).
Droughtiness	The assessment of the degree to which the shortage of soil water influences the range of crops which may be grown and level of yield that may be achieved.
Environmental Stewardship	An agri-environment scheme, which provides funding to farmers and other land managers in England who deliver effective environmental management of their land.
Entry Level Stewardship (ELS)	Basic level of entry into the Environmental Stewardship Scheme. As described under Environmental Stewardship above.
Glacial till	Unsorted material deposited directly by glacial ice and showing no stratification.
High Level Stewardship (HLS)	A more demanding level of Environmental Stewardship (than Entry Level) designed to build on the Entry Level Stewardship agreement.
Lacustrine deposit	Sediment derived from a lake.
Loam	Soil composed of sand, silt, and clay in relatively even concentration.
Onshore elements of Hornsea Three	Hornsea Three landfall area, onshore cable corridor, the onshore HVAC booster station, the onshore HVDC converter/HVAC substation and the interconnection with the Norwich Main National Grid substation
Permissive path	A path which the landowner has given the public permission to use.
Site Waste Management Plan	A plan setting out a framework for the management and mitigation of waste arising from Hornsea Project Three construction works, and protocols for the recording of waste arisings, waste minimisation measures and protocols that will be further developed and implemented by the construction teams.
Under drainage	Plastic pipe or tile drains located at approximately 85-95 cm depth within the soil.

Acronyms

Acronym	Description
ALC	Agricultural Land Classification
AONB	Area of Outstanding Natural Beauty
CEA	Cumulative Effect Assessment
CoCP	Code of Construction Practices
CROW Act	Countryside and Rights of Way Act 2000
Defra	Department for Environment, Food & Rural Affairs
DMRB	Design Manual for Roads and Bridges
DCO	Development Consent Order
EEA	European Economic Area
EIA	Environmental Impact Assessment
ELS	Entry Level Stewardship
HDD	Horizontal Directional Drilling
HLS	Higher Level Stewardship
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
MAFF	Ministry of Agriculture, Fisheries and Food
NMU	Non-Monitored User
NPPF	National Planning Policy Framework
NPS EN-1	National Policy Statement for Energy
NR1	National Cycle Network Route 1
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PRoW	Public Right of Way
SSSI	Site of Special Scientific Interest

Units

Unit	Description
cm	Centimetre (distance)
g	Gram (weight)
GW	Gigawatt (power)
ha	Hectare (area)
km	Kilometre (distance)
kg	Kilogram (weight)
kW	Kilowatt (power)
m	Metre (distance)
mm	Millimetre (distance)
MW	Megawatt (power)

6. Land Use and Recreation

6.1 Introduction

6.1.1.1 This chapter of the Environmental Statement presents the results of the Environmental Impact Assessment (EIA) for the potential impacts of the Hornsea Project Three offshore wind farm (hereafter referred to as 'Hornsea Three') on land use and recreation. Specifically, this chapter considers the potential impact of Hornsea Three landward of Mean High Water Springs, during its construction, operation and maintenance, and decommissioning phases.

6.1.1.2 Those impacts of Hornsea Three on geology and ground conditions, landscape and visual resources, noise and vibration, socio-economics, and offshore recreation are assessed in chapter 1: Geology and Ground Conditions, chapter 4: Landscape and Visual Resources, chapter 8: Noise and Vibration, chapter 10: Socio-economics, and volume 2, chapter 11: Infrastructure and Other Users respectively.

6.1.1.3 This chapter summarises information contained within technical reports, which are included in volume 6, annex 6.1: Agricultural Land Classification Published Data, annex 6.2: Soil Survey Results, and annex 6.3: Agricultural Land Classification and Farm Holdings Figures.

6.2 Purpose of this chapter

6.2.1.1 The primary purpose of the Environmental Statement is to support the Development Consent Order (DCO) application for Hornsea Three under the Planning Act 2008 (the 2008 Act) and accompanies the application to the Secretary of State for Development Consent.

6.2.1.2 It is intended that the Environmental Statement will provide statutory and non-statutory consultees with sufficient information to complete the examination of Hornsea Three and will form the basis of agreement on the content of the DCO.

6.2.1.3 In particular, this Environmental Statement chapter:

- Presents the existing environmental baseline established from desk studies, dedicated surveys and consultation;
- Identifies any assumptions and limitations encountered in compiling the environmental information;
- Presents the potential environmental effects on land use and recreational receptors arising from Hornsea Three, based on the information gathered and the analysis and assessments undertaken; and
- Highlights any necessary monitoring and/or mitigation measures which could prevent, minimise, reduce or offset the possible environmental effects identified at the relevant stage in the EIA process.

6.3 Study area

6.3.1.1 The Hornsea Three land use and recreation study area comprises the land uses and recreational resources that would be occupied by, or immediately adjacent to the onshore elements of Hornsea Three (namely the Hornsea Three landfall area, the onshore cable corridor, the onshore HVAC booster station, the onshore HVDC converter/HVAC substation and the connection with the Norwich Main National Grid substation, as well as storage areas and compounds) plus a 1 km buffer (see Figure 6.1). This study area has been selected as it represents the area in which the land use and recreation impacts are likely to occur.

6.3.1.2 The study area for farm holdings considers the farm holdings as a whole which may be affected by Hornsea Three and therefore is based on the known ownership boundaries of those farms with land that falls within the onshore elements of Hornsea Three, plus the storage areas and compounds.

6.3.1.3 Given that all works at the main construction compound would occur on existing hard-standing, there is no land use and recreation study area relevant to this element of Hornsea Three.

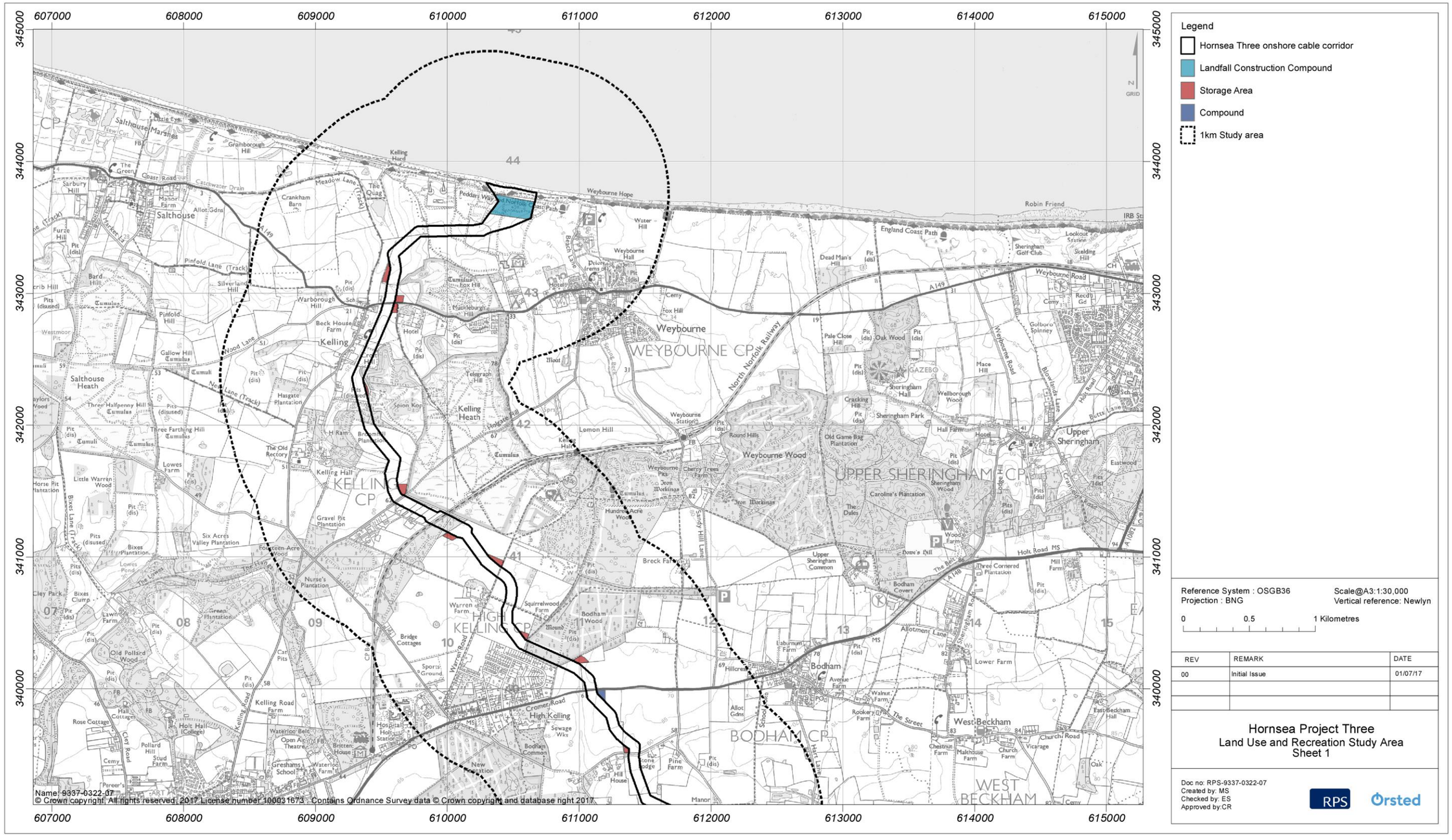
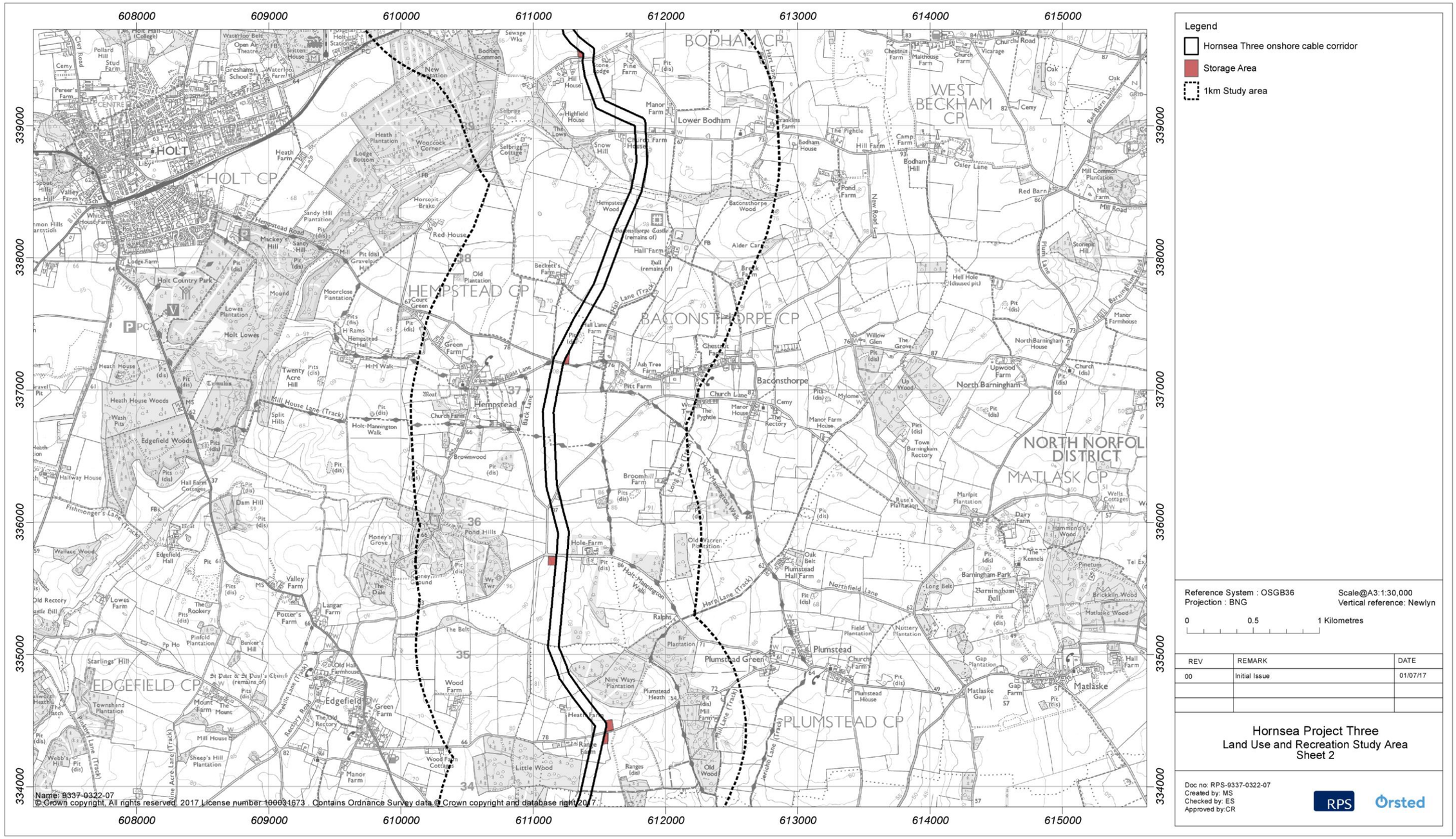


Figure 6.1: Land use and recreation study area.



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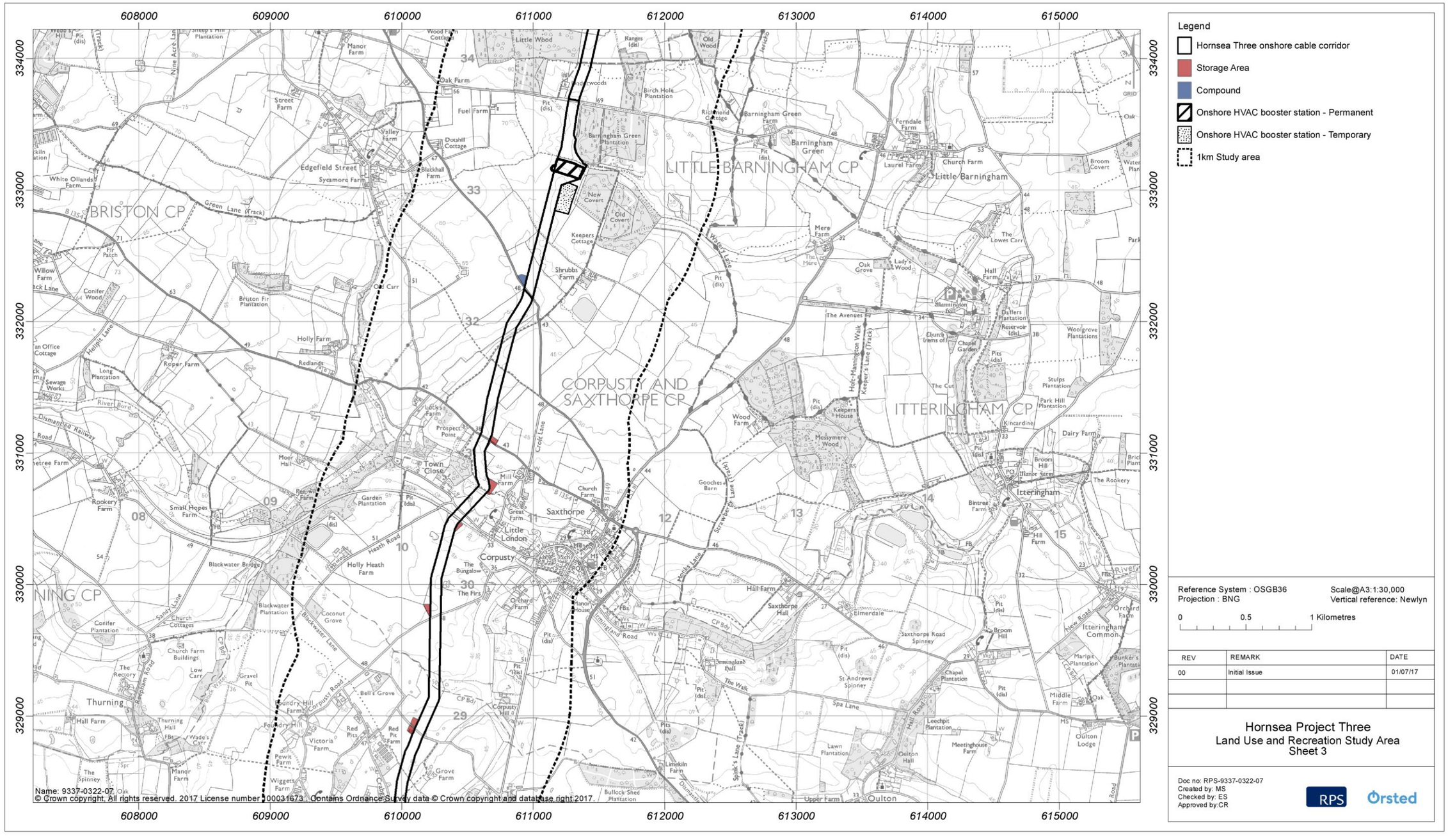

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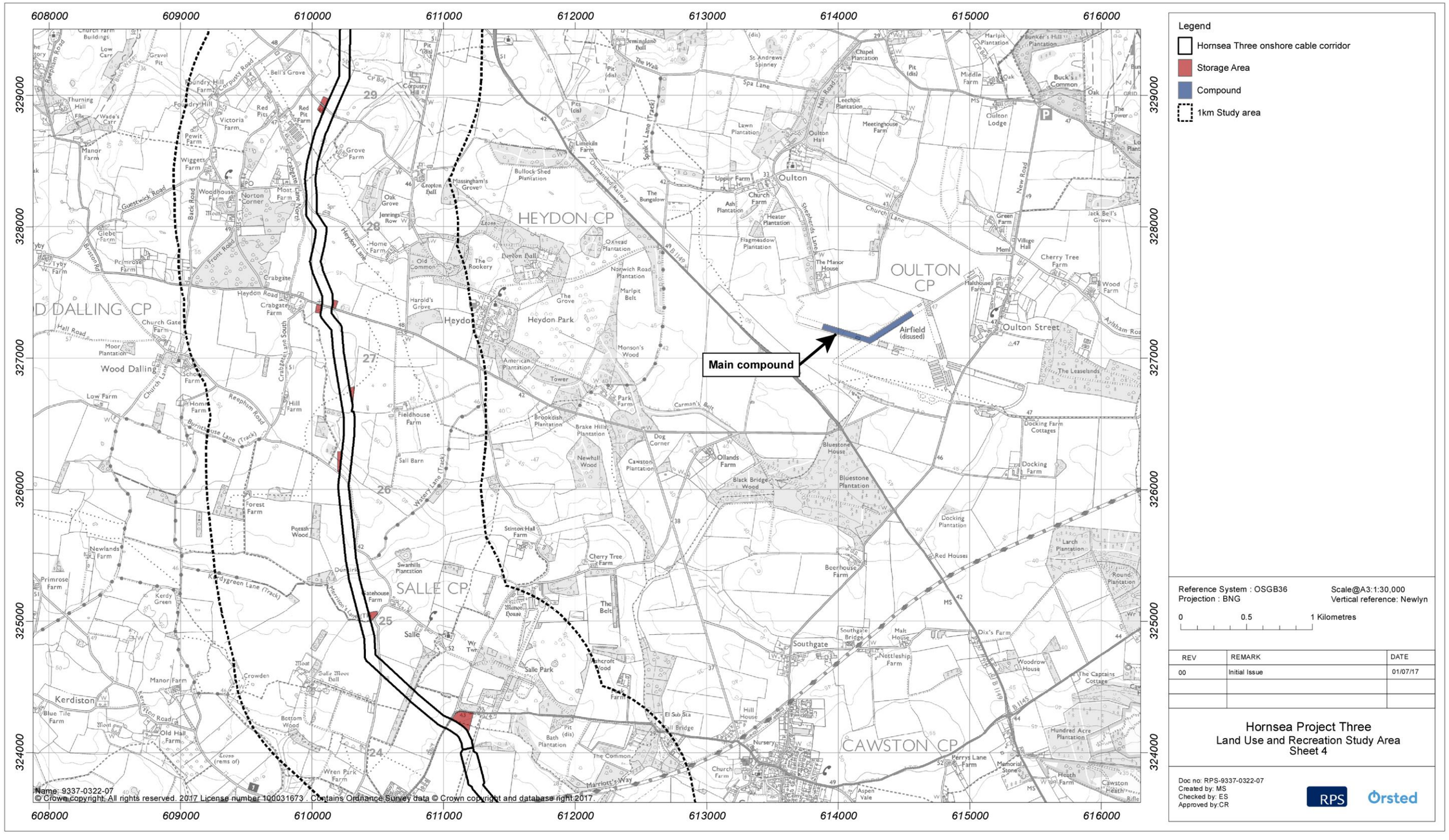

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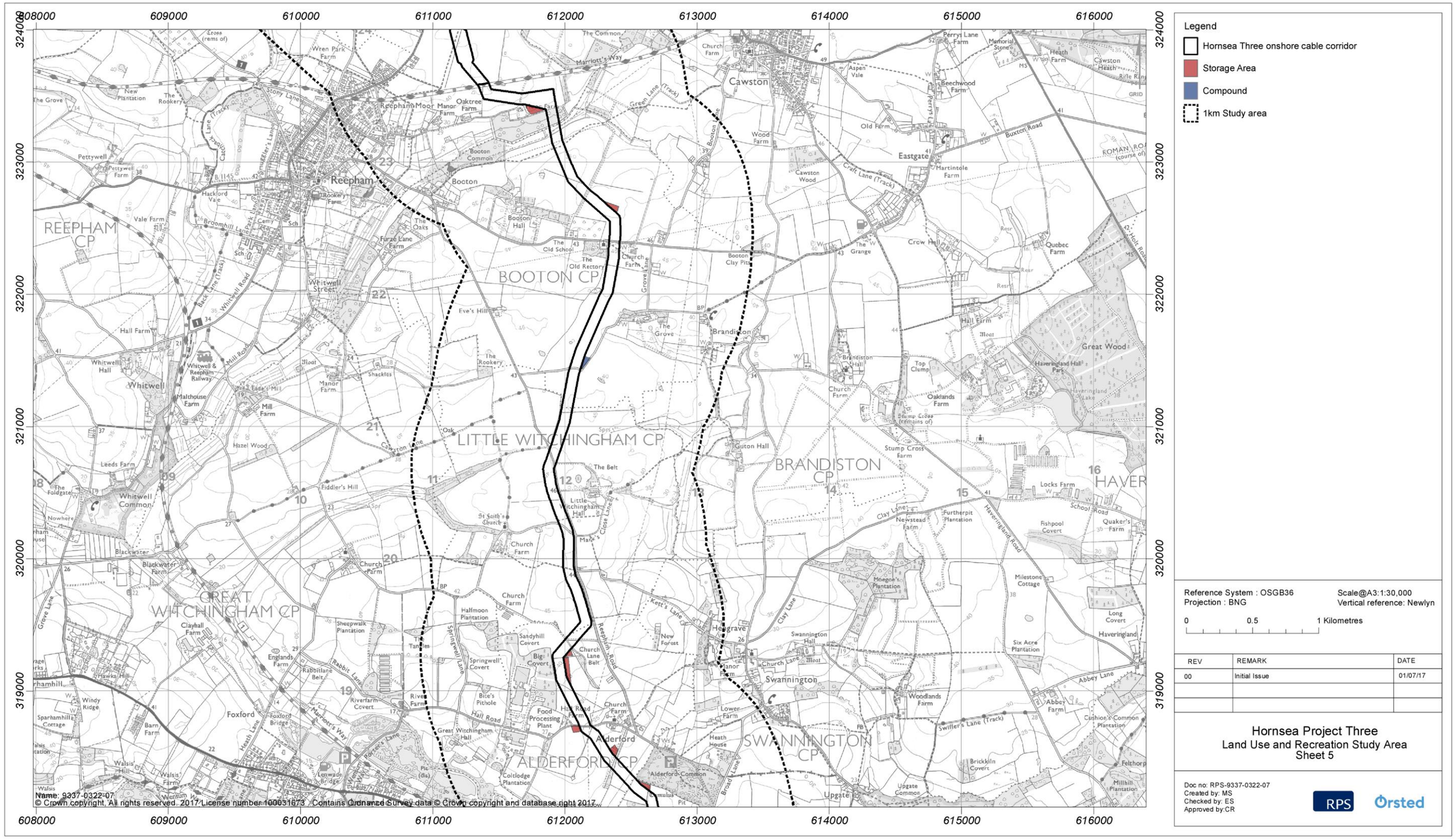

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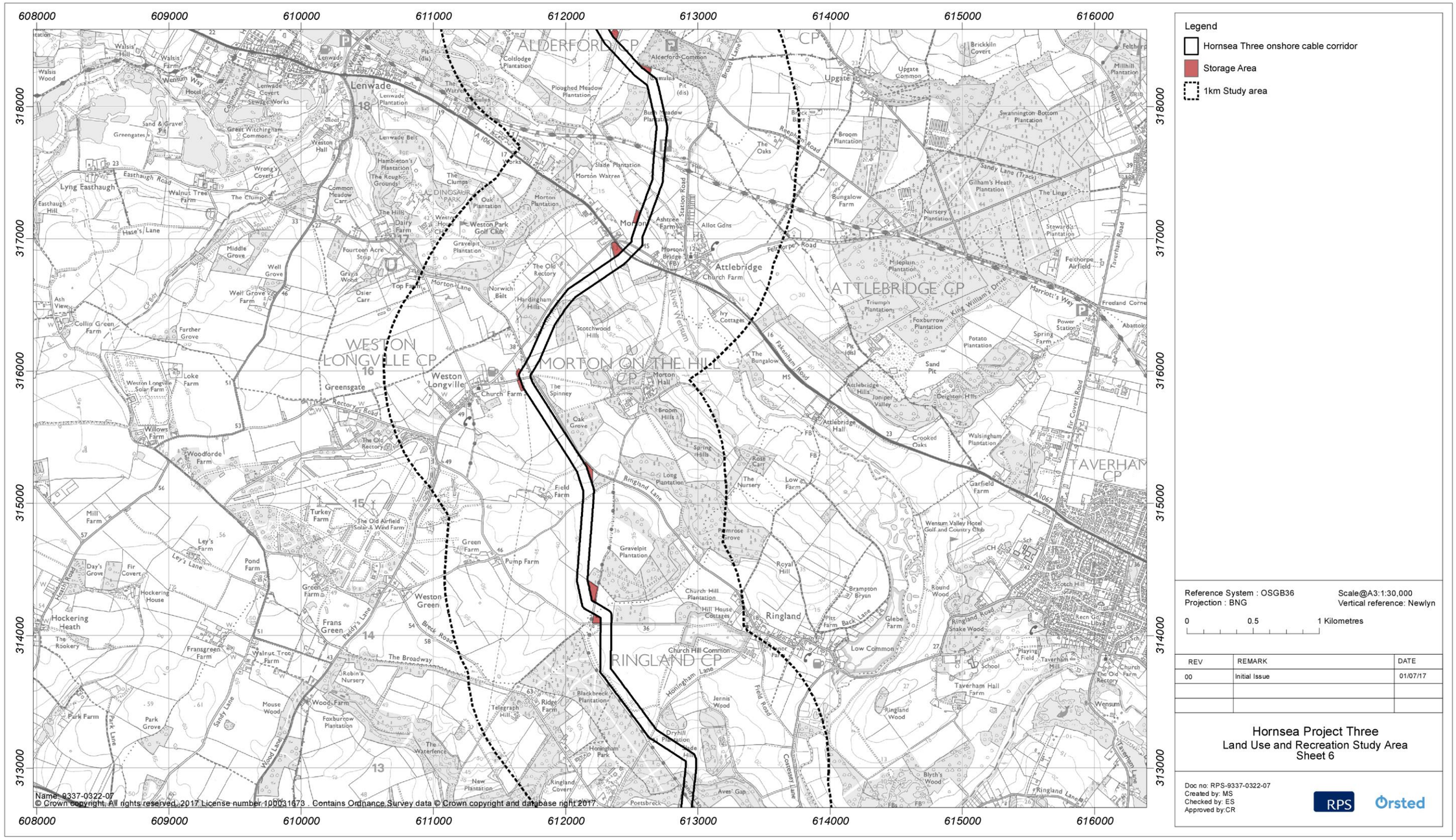

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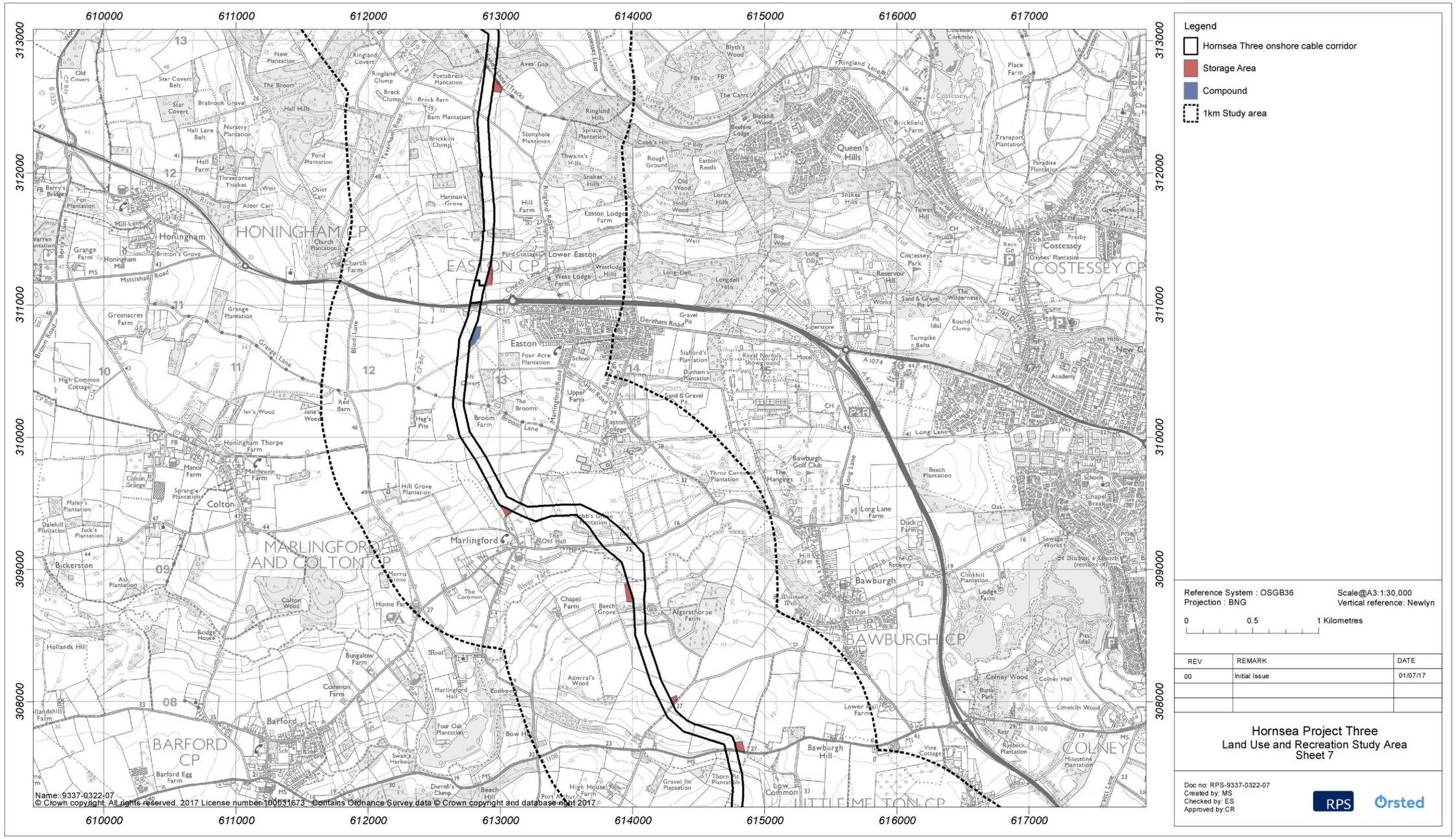

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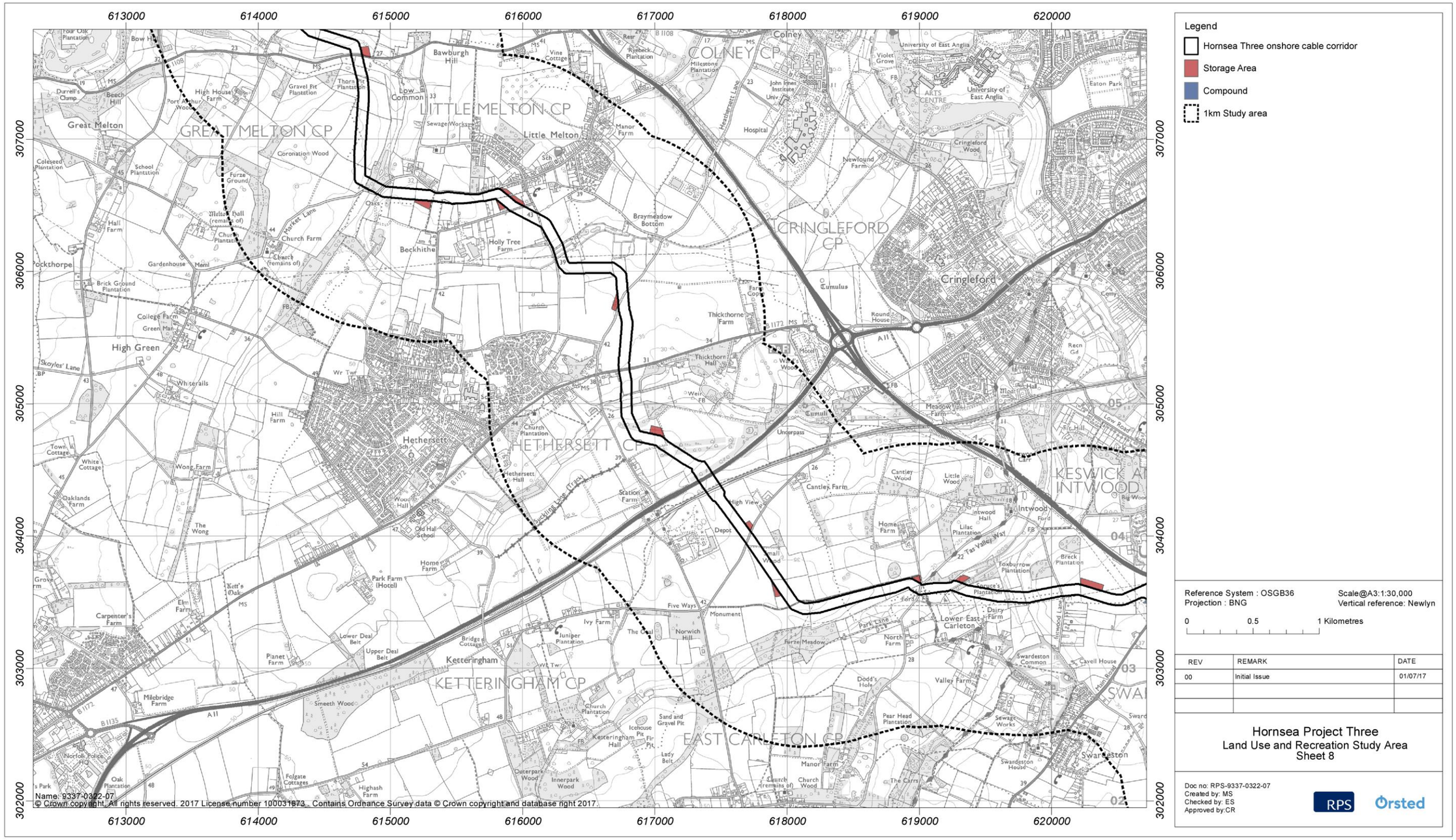

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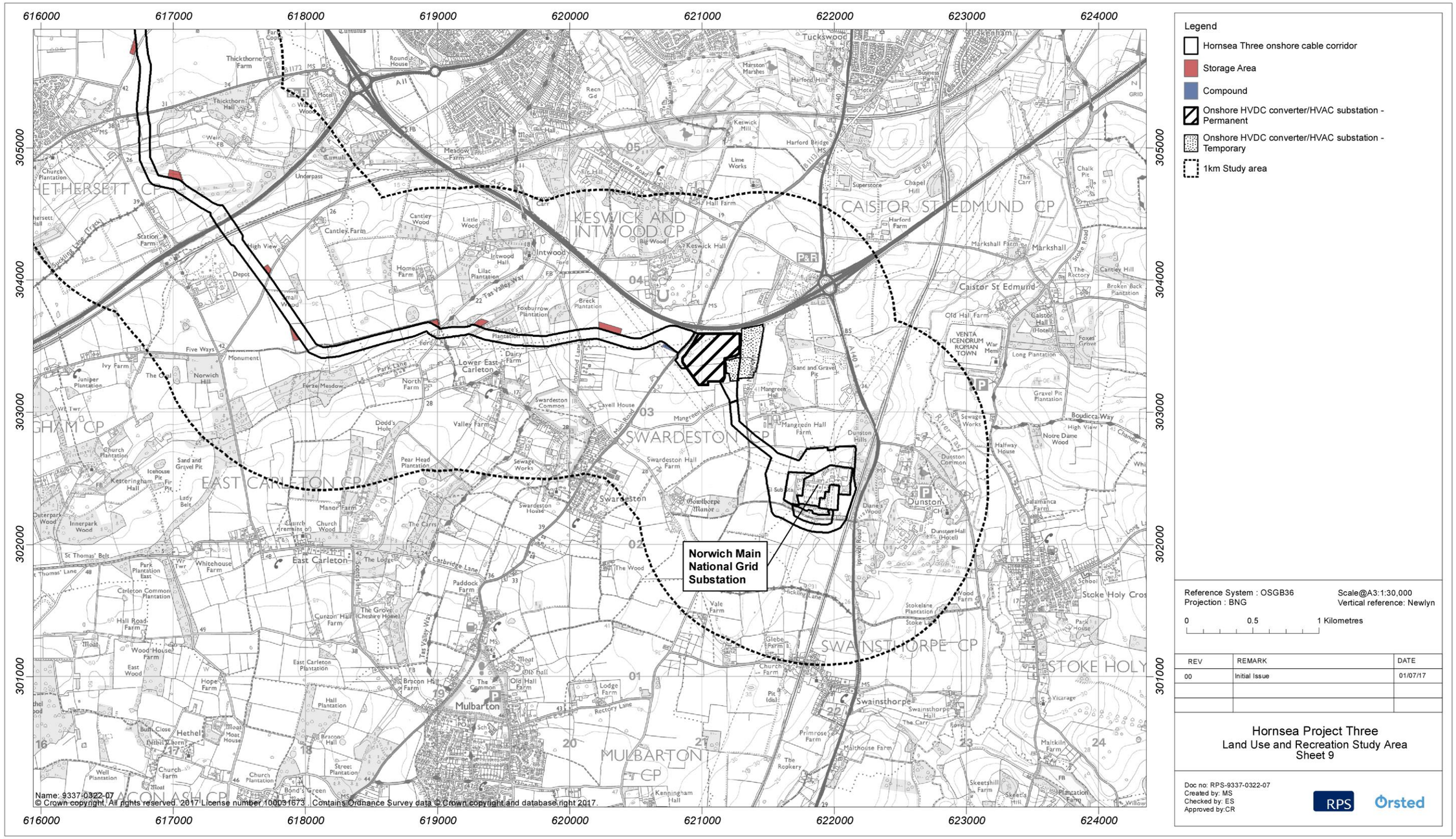

Figure 6.1: Land use and recreation study area.

6.4 Planning policy context

6.4.1 National Policy Statements

6.4.1.1 Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to land use and recreation, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy & Climate Change, 2011a).

6.4.1.2 NPS EN-1 includes guidance on which matters are to be considered in the assessment. These are summarised in Table 6.1.

Table 6.1: Summary of NPS EN-1 provisions relevant to land use and recreation.

Summary of NPS EN-1 provision	How and where considered in the Environmental Statement
The Environmental Statement should identify existing and proposed land uses near the project and assess the effects of the development (paragraph 5.10.5 of NPS EN-1).	The baseline environment has been identified and likely effects assessed within this chapter of the Environmental Statement (see sections 6.7 and 6.12).
Pre-application discussions between the applicant and the Local Authorities should identify any concerns regarding land use, having regard to the development plan and other relevant applications (paragraph 5.10.7 of NPS EN-1).	Public consultation has taken place during the development of the project proposals. Consultation has taken place with the Local Authorities to identify relevant proposed developments for cumulative assessment (see Table 6.4).
Applicants should seek to minimise effects on "best and most versatile" agricultural land except where this would be inconsistent with other sustainability considerations. Applicants should preferably use land in areas of poorer quality and should also identify any effects and seek to minimise impacts on soil quality (paragraph 5.10.8 of NPS EN-1).	This chapter of the Environmental Statement considers the effects on agricultural land and soils, including effects on "best and most versatile" agricultural land (see section 6.10). Measures proposed to be adopted as part of Hornsea Three to minimise impacts on soil quality are set out in Table 6.28.
Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place (paragraph 5.10.9 of NPS EN-1).	This matter is addressed in chapter 1: Geology and Ground Conditions.
Paragraph 5.10.14 of NPS EN-1 states that consent should not be granted for development on existing open space, sports and recreational buildings and land unless they are surplus to requirements. The Secretary of State, when deciding if the benefits outweigh the potential loss of facilities, is to take into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities.	An assessment of effects on recreational resources is provided in this chapter of the Environmental Statement (see section 6.11). However, it should be noted that the development of Hornsea Three would not directly impact on existing sports and recreational buildings.
Applicants should include appropriate mitigation measures to address adverse effects on coastal access, National Trails and other Public Rights of Way (PRoW) (paragraph 5.10.24 of NPS EN-1).	An assessment of effects on coastal access and PRoW is provided in this chapter of the Environmental Statement, including National Trails and other promoted routes (see section 6.11).

6.4.1.3 NPS EN-1 also highlights a number of points relating to the determination of an application and in relation to mitigation. These are summarised in Table 6.2.

Table 6.2: Summary of NPS EN-1 policy on decision making relevant to land use and recreation.

Summary of NPS EN-1 policy on decision making (and mitigation)	How and where considered in the Environmental Statement
The examining authority should ensure that developments are not located on the "best and most versatile" agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land except in areas where particular agricultural practices contribute to the quality and character of the environment or economy (NPS EN-1, 5.10.15).	Effects from the Hornsea Three onshore cable corridor construction activities, including any Horizontal Directional Drilling (HDD) works, would be largely temporary, with works areas restored following construction (see section 6.11.1). The impacts arising from the locations for the onshore HVAC booster station and the onshore HVDC converter/HVAC substation are set out in section 6.11.
The examining authority should not grant consent for a development on existing open space, sports/recreational buildings or land unless an assessment to show the open space/land to be surplus to requirements has been undertaken or the benefits of the project outweigh the potential loss of such facilities, taking into account any positive proposals e.g. compensatory measures made by the applicant (NPS EN-1, 5.10.14).	Effects from the Hornsea Three onshore cable corridor construction activities on PRoW would be temporary, with land and routes fully restored following construction (see section 6.11.1). The impacts on all recreational resources arising from the locations for the onshore HVAC booster station and the onshore HVDC converter/HVAC substation are set out in section 6.11.
In considering the impact on maintaining coastal recreation sites and features, the Infrastructure Planning Commission should expect applicants to have taken advantage of opportunities to maintain and enhance access to the coast (paragraph 5.10.16 of NPS EN-1).	An assessment of effects on coastal recreation is set out in section 6.11 in this chapter of the Environmental Statement.

6.4.2 Other relevant polices

6.4.2.1 A number of other policies are potentially relevant to land use and recreation including:

- National Planning Policy Framework (NPPF) (2012);
- Web based planning practice guidance provided by the Department for Communities and Local Government. Guidance on the Natural Environment, updated in January 2016;
- North Norfolk Core Strategy (adopted 2008); and
- South Norfolk and Broadlands Joint Core Strategy.

6.4.2.2 Key provisions of these policies are set out in Table 6.3 along with details as to how these have been addressed within this chapter.

Table 6.3: Summary of other relevant policies relevant to land use and recreation.

Summary of other relevant policy provision	How and where considered in the Environmental Statement
National Planning Policy Framework	
"Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality." (paragraph 112 NPPF). The NPPF defines high quality "best and most versatile" agricultural land to comprise Grades 1, 2 and 3a as defined within the Agricultural Land Classification (ALC) system.	This approach has been followed in the site selection process (see volume 1, chapter 4: Site Selection and Consideration of Alternatives).
The NPPF highlights the importance of access to high quality open spaces and opportunities for sport and recreation to the health and well-being of communities (paragraph 73), and states that existing open space, sports and recreational buildings and land, including playing fields, should not be built on unless certain criteria are met (paragraph 74).	This approach has been followed in the site selection process (see volume 1, chapter 4: Site Selection and Consideration of Alternatives).
The NPPF states that "*Local Authorities should seek opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails"* (paragraph 75).	Effects from the Hornsea Three onshore cable corridor construction activities on PRoW would be temporary, with land and routes fully restored following construction (see section 6.11.1). The impacts on all recreational resources arising from the locations for the onshore HVAC booster station and the onshore HVDC converter/HVAC substation are set out in section 6.11.1.
National Planning Practice Guidance	
The NPPG includes the need to protect and enhance valued soils and to take into account the economic and other benefits of the "best and most versatile" agricultural land. Guidance in relation to recreational resources is provided under the headings of 'Open space, sports and recreation facilities' and 'Pubic rights of way and National Trails', which reiterates that PRoWs form an important component of sustainable transport links and should be protected or enhanced.	The baseline environment has identified the nature of the soils and the areas of "best and most versatile" agricultural land likely to be affected by Hornsea Three. A Soil Management Strategy, included in the Outline Code of Construction Practice (CoCP) (document reference A8.5), would be developed to protect soil resources affected by Hornsea Three. The effects from the Hornsea Three onshore cable corridor construction activities on PRoW would be temporary, with land and routes fully restored following construction (see section 6.11.1). The impacts on all recreational resources arising from the locations for the onshore HVAC booster station and the onshore HVDC converter/HVAC substation are set out in section 6.11.1.
Local Planning Policy	
The Local Plan for North Norfolk currently guides development in the district and includes, amongst other documents, the Core Strategy (North Norfolk District Council, 2008) which sets out local planning policies. Those policies relevant to this topic are as follows: • Policy SS2 "Development in the Countryside" which limits development to certain categories including renewable energy projects; • Policy SS4 "*Environment*" which includes the protection and enhancement of natural and built environmental assets, protection of open spaces and the creation of green networks; • Policy SS6 "*Access and Infrastructure*" which includes the protection and enhancement of existing provision/facilities, open space, walking and cycling networks and PRoWs; • Policy EN1 "*Norfolk Coast Area of Outstanding Natural Beauty*" which places limit development which would have a detrimental effect on the special qualities of the Norfolk Coast Area of Outstanding Natural Beauty (AONB); • Policy EN3 "*Undeveloped Coast*" which limits development to that which can demonstrate that a coastal location is required and that will not be significantly detrimental to the open coastal character; and • Policy CT1 "*Open Space Designations*" which restricts development in areas designated as "*Open Land Areas*" or "*Educational and Formal Recreation Areas*".	The baseline environment has been identified and likely effects assessed within this chapter (see section 6.7). An assessment of effects on recreational resources is provided in this chapter of the Environmental Statement (see section 6.11).
Planning policy for South Norfolk and Broadland is currently contained within the adopted Joint Core Strategy between South Norfolk District Council, Broadland District Council, Norwich City Council and Norfolk County Council. Policies relevant to this topic are as follows: • Policy 1 "*Addressing climate change and protecting environmental assets*" which includes the protection, maintenance, restoration and enhancement of environmental assets; the expansion and linking of valuable open space and areas of biodiversity importance to create green networks; and • Policy 6 "*Access and Transportation*" which includes the improvement of the bus, cycling and walking network.	The baseline environment has been identified and likely effects assessed within this chapter (see section 6.7). An assessment of effects on recreational resources is provided in this chapter of the Environmental Statement (see section 6.11). Climatic data was considered in the baseline in section 6.7 of this chapter.

6.5 Consultation

6.5.1.1 Table 6.4 below summarises the issues raised relevant to land use and recreation, which have been identified during consultation activities to date. Table 6.4 also indicates either how these issues have been addressed within this Environmental Statement or how the Applicant has had regard to them. Further information on the consultation activities undertaken for Hornsea Three can be found in the Consultation Report (document reference A5.1) which accompanies the DCO application.

Table 6.4: Summary of key consultation issues raised during consultation activities undertaken for Hornsea Three relevant to land use and recreation.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
July 2016	Broadland District Council	Broadland District Council flagged that areas around the River Wensum Site of Special Scientific Interest (SSSI), near Haydon and Aylsham, would be particularly sensitive to potential construction impacts.	The soil type/character of areas in the vicinity of the River Wensum and its tributaries are identified in section 6.7.2.33. Recreational use of the River Wensum and surrounding network is also considered in section 6.7.3.7. Potential impacts on soils are considered in section 6.11.1.
July 2016	North Norfolk District Council	Heritage rail lines near Weybourne and associated activities are likely to be a constraint, along with interface with past buried cable projects (Dudgeon and Sheringham Shoal Offshore Wind Farms).	Potential impacts on the North Norfolk Railway are considered in section 6.11.1.
December 2016	PINS - Scoping Opinion	The potential for sterilization of land along the Hornsea Three onshore cable corridor during all phases of the proposed development was highlighted. This is a particular issue with underground connecting infrastructure and the Secretary of State expects the Environmental Statement to assess these impacts.	Potential impacts on agricultural land and land within farm holdings are considered in section 6.11.1. During the construction phase, top soil and sub soils will be stripped and stored in accordance with best practice and the land within the Hornsea Three onshore cable corridor will be restored to its original condition, therefore reducing the potential for sterilisation.
December 2016	PINS - Scoping Opinion	Volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion notes that in relation to recreational impacts, there is an overlap with other chapters in the Environmental Statement. It is important that any cross-referencing is clear to demonstrate that all impacts have been assessed.	Cross-references to the other Environmental Statement chapters are provided in paragraph 6.1.1.2. Inter-related effects are considered in chapter 11: Inter-Related Effects (Onshore).
December 2016	PINS - Scoping Opinion	The Hornsea Three land use and recreation study area at paragraphs 12.3.3 and 12.3.4 of the Scoping Report (see volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion) references land use and recreation but not agriculture. The Environmental Statement needs to be clear as to how impacts on land use, agriculture and recreation have individually been assessed, what the impacts are and any mitigation that has been taken into account in the assessment.	The assessment methodology is set out in section 6.9, the measures adopted as part of Hornsea Three are outlined in Table 6.28 and the impacts on agriculture are identified in section 6.11.
December 2016	PINS - Scoping Opinion	The Hornsea Three land use and recreation study area does not include any land outside the Hornsea Three onshore cable corridor. The Applicant is encouraged to justify this in the Environmental Statement ensuring that any land use impacts within the Hornsea Three onshore cable corridor do not affect land outside the onshore cable corridor, for example, leading to severance.	The Hornsea Three land use and recreation study area is defined in paragraph 6.3.1.1 and explains that the study area for farm holdings considers the farm holdings as a whole (i.e. land that could lie outside the Hornsea Three onshore cable corridor and 1 km buffer used for the study area) where severance issues may occur for this topic.
December 2016	PINS - Scoping Opinion	The Applicant does not appear to propose undertaking any assessments through site visits to inform the baseline position.	A site visit was undertaken in February 2017 to establish the nature and condition of the PRoW resources (see paragraph 6.6.1.6). Site visits were also undertaken in autumn 2017 to undertake soil sampling (see section 6.6.2).
December 2016	PINS - Scoping Opinion	This section should consider the interrelationships with impacts to ecology, in particular the impacts from the removal of grassland, trees and hedgerows and socio-economic impacts. Recreation is also assessed as part of the socio-economic chapter. The Environmental Statement should be clear on which topics are assessed within each chapter to reduce duplication.	The scope of the chapter is set out in section 6.2 and cross references to other relevant chapters are provided. The removal of trees and hedgerows are only considered in this chapter where it has an impact on farming systems or represents a loss of or disruption to recreational resources.
December 2016	PINS - Scoping Opinion	The Scoping Report (see volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion) does not clearly set out how significance of impact is assessed.	The assessment methodology is set out in section 6.9.
December 2016	PINS - Scoping Opinion	The Scoping Report (see volume 4, annex 5.5: Scoping Report and PINS Scoping Opinion) sets out the measures to be adopted to mitigate effects. At present this does not make reference to a Soil Management Strategy.	A Soil Management Strategy and other measures adopted as part of Hornsea Three are set out in Table 6.28 below and the Outline CoCP (document reference A8.5).
December 2016	PINS - Scoping Opinion	Impacts from the development should be considered in light of the Government's policy for the protection of the "best and most versatile" agricultural land. We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystems they provide.	The assessment has been undertaken in accordance with paragraph 112 of the NPPF and the measures adopted as part of Hornsea Three in Table 6.28 follows guidance from Department for Environment, Food & Rural Affairs' (Defra) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2011).
February 2017	Broadland District Council - Update Meeting	Broadland District Council flagged that potential effects on PRoWs will be important, noting in particular the well-used Marriott's Way.	Impacts on the Marriott's Way route are considered in section 6.11.1.
September 2017	Norfolk County Council – Section 42 Response	Impacts of the development of all PRoW needs to be considered, not just routes of regional and national importance.	Impacts on PRoW and other linear recreational routes during construction are considered in section 6.11.1.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
		Consideration of cumulative effects of Hornsea Three and the Vattenfall NSIP should be included.	Cumulative impacts on recreational resources are included in section 6.13.
		Temporary TROs should be put in place should PRoW need to be temporarily closed.	PRoW affected during the construction phase will either be temporarily diverted or maintained along existing alignments with management measures put in place as required. See section 6.11.1.
		Alternative routes for the Marriott's Way and England Coast path should be identified and be off-road where possible.	Marriott's Way will be maintained along its existing alignment during the construction period. The Peddars Way and North Norfolk Coast Path which joins the England Coast Path to the east of Weybourne will be maintained along its existing alignment should HDD be used in the Hornsea Three landfall area. If open trenching is used the route will be temporarily diverted along existing tracks to the immediate south for a maximum of three months on up to two occasions. See section 6.11.1.
		Consideration should be given to the public car park on the Marriott's Way at TG12801760 during construction.	As set out in the Outline CoCP (document reference A8.5), the car park will remain operational during the construction phase.
		Post construction Norfolk County Council would seek opportunities for PRoW enhancements and reinstatement of vegetation.	Consultation is ongoing with Norfolk County Council on these matters.
September 2017	North Norfolk District Council – Section 42 Response	PRoW affected by the construction works should be diverted with closures only when absolutely necessary.	No PRoWs will be closed as a result of construction activities. Those affected during the construction phase will either be temporarily diverted or maintained along existing alignments with management measures put in place as required. See section 6.11.1.
September 2017	Royal Yachting Association – Section 42 Response	The Royal Yachting Association highlighted potential issues where the cable crosses inland waterways.	The Hornsea Three onshore cable corridor will be constructed by HDD under inland waterways and therefore no effects on the recreational use of these resources is anticipated as described in section 6.11.1.
September 2017	Friends of North Norfolk -Section 42 Response	Impact of the development on the coastal path.	The Peddars Way and North Norfolk Coast Path which joins the England Coast Path to the east of Weybourne will be maintained along its existing alignment should HDD be used in the Hornsea Three landfall area. If open trenching is used the route will be temporarily diverted along existing tracks to the immediate south, for a maximum of one month, on up to six occasions. See section 6.11.1.
September 2017	Individual Landowners and Agents acting on behalf of Landowners – Section 42 Response	Maintenance of farm accesses during the construction period.	Outline CoCP (document reference A8.5) – commitment to the retention of access for farming activities, as far as possible. A Liaison Officer will also work with landowners and their representatives during construction to minimise disruption. See Table 6.28.
September 2017	Individual Landowners and Agents acting on behalf of Landowners - Section 42 Response	Maintenance of sporting activities – commercial shoots.	Outline CoCP (document reference A8.5) – Liaison Officer to work with landowners and their representatives to ensure minimum disruption. See also Table 6.28.
September 2017	Individual Landowners and Agents acting on behalf of Landowners - Section 42 Response	Maintenance and reinstatement of drainage systems.	Outline CoCP (document reference A8.5) – this includes commitment to maintain land drainage during construction and restore drainage systems as part of the land reinstatement programme at the end of construction. Potential effects are taken into account in this assessment. See also Table 6.28.
September 2017	Individual Landowners and Agents acting on behalf of Landowners - Section 42 Response	Maintenance and reinstatement of irrigation systems.	Outline CoCP (document reference A8.5) – this includes commitment to maintain water supplies and irrigation systems, as far as possible during construction. Potential effects are taken into account in this assessment. See also Table 6.28.
September 2017	Individual Landowners and Agents acting on behalf of Landowners - Section 42 Response	Implementation of Biosecurity Measures.	Measures to be adopted included in the Outline CoCP (document reference A8.5). See also Table 6.28.
September 2017	Individual Landowners and Agents acting on behalf of Landowners - Section 42 Response	Effects of the construction on soil resources and agricultural land quality.	Outline CoCP (document reference A8.5) – Soil Management strategy to be developed and implemented with supervision by a suitably qualified person. See also Table 6.28.
December 2017	Broadlands District Council – Further Section 42 Response	An additional access run alongside or within the Marriot's Way footpath, bridleway and cycleway for 0.68km. Details should be provided as to how the use of this section of the Marriot's Way footpath will be safeguarded.	The Hornsea Three onshore cable corridor crosses the Marriot's Way in two locations (Reepham and Attlebridge). In both locations the onshore cable corridor will be installed using HDD techniques to ensure that there would be no impact on the use of this route during the construction phase of Hornsea Three.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this chapter
December 2017	Norfolk Coast Partnership – Further Section 42 Response	The Norfolk Coast Path National Trail and other circular routes, PRoW and permissive paths in the area are well used by visitors and locals and any disruption and closure of paths should be minimised.	The measures to be taken to ensure the continued use of all linear recreational resources during the construction phase of the project have been discussed with Norfolk County Council and are set out in the Outline CoCP (document reference A8.5). This dialogue will continue during the detailed design process.
January 2018	Norfolk County Council	PRoW management measures.	Measures are contained within the Outline CoCP (document reference A8.5).

6.6 Methodology to inform the baseline

6.6.1 Desktop study

6.6.1.1 Baseline information on land use and recreation within the Hornsea Three land use and recreation study area was collected through a detailed desktop review of existing studies and datasets. These are summarised in Table 6.5.

Table 6.5: Summary of key desktop sources.

Title	Source	Year	Author
1 inch to 1 mile ALC Sheets 125 and 126 and accompanying Reports	Ministry of Agriculture	1972	Ministry of Agriculture Fisheries and Food (MAFF)
Soils of Eastern England 1:250,000 and accompanying Regional Bulletin	Soil Survey of England and Wales	1983	Soil Survey of England and Wales
Soils in Norfolk V and accompanying Record No. 64	Soil Survey of England and Wales	1980	Elridge
Soils of Norfolk II and accompanying Record No. 21	Soil Survey of England and Wales	1974	Corbett and Tatler
Meteorological Office Climatological Data for ALC	Meteorological Office	1990	Meteorological Office
Published Detailed ALC Survey Data	Natural England http://publications.naturalengland.org.uk/category/5954148537204736	Online	Natural England
MAGIC	http://www.natureonthemap.naturalengland.org.uk/	Online	Defra
Definitive map of public rights of way	https://maps.norfolk.gov.uk/highways/	Online	Norfolk County Council Highways
Cycle routes	http://www.sustrans.org.uk/http://www.sustrans.org.uk/	Online	Sustrans
Defra Farming Statistical Data	http://www.defra.gov.uk/statistics/foodfarm/	Online	Defra

6.6.1.2 The desktop study undertaken to identify existing baseline conditions in relation to agricultural land use and soils focused on:

- Soil types and patterns of soils through the Hornsea Three land use and recreation study area;
- Quality of the agricultural land determined by the application of the MAFF ALC system 1988 which classifies agricultural land from Grade 1 (excellent quality agricultural land) to Grade 5 (very poor quality agricultural land), with Grades 1, 2 and Subgrade 3a defined as the "best and most versatile" agricultural land; and
- Nature and pattern of farm holdings within the Hornsea Three land use and recreation study area (see section 6.3).

6.6.1.3 The assessment includes consideration of the published data set out in Table 6.5, British Geological Survey Internet Portal (at British Geological Survey, n.d.) and Natural England Access to Evidence Published ALC Data (http://publications.naturalengland.org.uk/category/5954148537204736 (Reports and Maps contained in volume 6, annex 6.1: Agricultural Land Classification Published Data), which provides information that will be used in the assessment of the likely ALC of the Hornsea Three land use and recreation study area.

6.6.1.4 Information on the pattern of agricultural land use and the farming framework likely to be affected has been collated from Defra Farming Statistical Data (Defra, n.d.) (http://www.defra.gov.uk/statistics/foodfarm/). Statistical data is available for 2013 and 2016 from the government website, www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june (Defra, 2016).

6.6.1.5 In addition to the farming statistical information collated, specific information relevant to land holdings within the Land Use and Recreation study area has been collated from a number of sources, including discussions between the landowners and land agents representing Hornsea Three, land registry information, as well as observations made during site visits and ALC survey visits.

6.6.1.6 The baseline conditions for recreational resources, including land used by the community (e.g. public open space; common land), recreational facilities (e.g. the coast; camping and caravanning sites; visitor attractions) and PRoW and other linear recreational routes, were established using data collected from:

- A desktop study to identify those recreational resources within, and in proximity to, the onshore elements of Hornsea Three (i.e. the Hornsea Three landfall area, onshore cable corridor, onshore HVAC booster station, onshore HVDC converter/HVAC substation and the interconnection with the Norwich Main National Grid substation, together with compounds and storage areas); and
- A site visit, which was undertaken in February 2017, to establish the nature and condition of those resources.

6.6.1.7 The source material for the baseline desk study has included Ordnance Survey (OS) mapping, definitive maps of PRoW, tourist information and information about tourism/recreation facilities available from the local authority and web resources.

Identification of designated sites

6.6.1.8 All designated sites within the Hornsea Three land use and recreation study area that could be affected by the construction, operation and maintenance and decommissioning of Hornsea Three in respect to land use and recreation were identified using the three-step process described below:

- Step 1: All designated sites of international, national and local importance within the Hornsea Three land use and recreation study area were identified using a number of sources. These included MAGIC (www.natureonthemap.naturalengland.org.uk);
- Step 2: Information was compiled on the relevant features for each of these sites; and
- Step 3: Using the above information and expert judgement, sites were included for further consideration if sites and associated features were located within the Hornsea Three land use and recreation study area.

6.6.2 Site specific surveys

6.6.2.1 In order to inform the EIA, site-specific surveys were undertaken, as agreed with the statutory consultees and Local Authorities (see Table 6.4). A summary of surveys undertaken to inform the Environmental Statement are outlined in Table 6.6.

Table 6.6: Summary of site-specific survey data.

Title	Extent of survey	Overview of survey	Survey contractor	Date	Reference to further information
Walkover survey	PRoWs within the Hornsea Three land use and recreation study area, including footpaths and National Cycle Network Routes; areas of access land; other recreational resources (e.g. caravan and holiday parks).	Walkover of the PRoWs within the Hornsea Three onshore cable corridor, onshore HVAC booster station and onshore HVDC converter/HVAC substation to establish the nature and condition of these recreational resources. The surveyors identified issues that may arise at crossing points, particularly in relation to the temporary stopping up and/or diversion of routes during construction and the identification of locations at which it is essential to keep routes open through traffic management measures. Visit to areas of access land and recreational resources affected by Hornsea Three.	RPS	February 2017	Section 6.7.
Site visits	Various locations on the Hornsea Three onshore cable corridor, focusing on locations around larger watercourse crossing areas.	Review of potential construction accesses and potential crossing locations, to inform further project development work and discussion with stakeholders/asset/land owners, and to inform the assessment of effects on land use and recreation resources.	RPS/Kelvin Engineering	April 2017	Section 6.7. Volume 6, annex 2.4: Hydrological Characterisation Report
ALC surveys	Areas of agricultural land temporarily and permanently affected by Hornsea Three.	The survey comprised two parts: • A reconnaissance survey of the soils to identify the nature and ALC of the soil types identified from the study of published information. This included the use of hand auger borings and soil pits, where necessary to confirm the characteristics of soil profiles within each of the soil types; and • A detailed ALC survey of area where there would be permanent loss of agricultural land (i.e. the onshore HVAC booster station area and onshore HVDC converter/HVAC substation area), comprising hand auger borings taken at approximately 100 m intervals across the area and soil pits as necessary.	RPS	September 2017 to January 2018	Volume 6, annex 6.1: Agricultural Land Classification Published Data. Volume 6, annex 6.2: Soil Survey Results

6.7 Baseline environment

6.7.1 Designated sites

6.7.1.1 Based on the methodology set out in section 6.6.1.8 only one designated site was identified within the Hornsea Three land use and recreation study area. This comprises the Norfolk Coast AONB as described below.

6.7.1.2 The Norfolk Coast AONB runs along the coastline at the proposed Hornsea Three landfall area, extending inland to Bodham and High Kelling up to the A148, Cromer Road. The statutory purpose of designating an area of land as an AONB is to conserve and enhance the natural beauty of the area, with two secondary aims to:

- Meet the need for quiet enjoyment of the countryside, so far as this is consistent with the statutory purpose of conserving and enhancing the area's natural beauty; and
- Have regard for the interests of those who live and work there (i.e. to take account of the needs of agriculture, forestry, fishing and other local rural industries and of the economic and social needs of local communities).

6.7.1.3 The Norfolk Coast AONB contains a mix of coastal features such as salt-marsh, intertidal flats, dunes, shingle and grazing marsh, together with inland agricultural landscapes of rolling hills and ridges of chalk, greensand and sands and gravels. The coastal economy relies on tourism and other service industries, although agriculture and fishing are still important. Day and weekend visitors enjoy a range of informal recreational activities including walking (including along the Peddars Way and Norfolk Coast Path National Trail), beach activities and exploring local villages.

6.7.2 Agricultural Land Classification

Climate Data for Agricultural Land Classification

6.7.2.1 The climatic data needed to apply the revised ALC system can be derived from the Meteorological Office standard 5 km grid point data set for chosen representative points whose grid reference and altitude are known. It includes the Accumulated Temperature (day degrees) and Average Annual Rainfall (mm), both of which are used to determine the maximum grading due to the overall climatic conditions.

6.7.2.2 The data also includes the Field Capacity Duration which is the number of days over winter (or longer) when the soils are at or above a critical moisture content known as Field Capacity. This is used, with other information, to determine the Wetness Class of the soils and the effect of any drainage defects on the ALC gradings.

6.7.2.3 Droughtiness limitations in the revised ALC system are assessed by comparing the dryness of the climate during the growing season with the ability of the soils to supply water to two test crops, wheat and potatoes. The climatic parameter used is the Moisture Deficit which is calculated from rainfall and evapotranspiration data, taking account of the rooting pattern of the crop under consideration. This is then compared with the calculated, crop-adjusted, available water capacities for the soils from their horizon depths, textures, structural conditions and stone content.

6.7.2.4 The data for selected points, which represent the range of soil types and height values and are located from north to south within the Hornsea Three land use and recreation study area, are listed in Table 6.7 and shown in volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures.

Table 6.7: Climatic data for ALC.

Grid Reference	Height (m)	Accumulated temperature (day degrees)	Average annual rainfall (mm)	Field capacity duration (days)	Moisture deficit wheat (mm)	Moisture deficit potatoes (mm)
TG107431	8	1,407	641	134	117	113
TG106410	72	1,335	679	141	107	99
TG118399	61	1,348	682	143	108	100
TG113368	82	1,325	706	148	103	93
TG111330	58	1,354	698	146	105	96
TG106315	41	1,375	683	141	107	99
TG102297	47	1,369	680	140	106	98
TG102275	47	1,370	672	136	109	101
TG120230	36	1,384	650	130	114	107
TG120210	44	1,376	650	129	114	107
TG121190	32	1,390	637	126	117	111
TG118162	39	1,384	629	123	118	113
TG125135	37	1,387	625	122	119	114
TG128109	39	1,385	627	123	119	114
TG141089	15	1,413	614	121	122	118
TG147077	33	1,394	623	122	118	113
TG162062	42	1,384	626	122	115	109
TG176040	35	1,392	615	120	116	110

Grid Reference	Height (m)	Accumulated temperature (day degrees)	Average annual rainfall (mm)	Field capacity duration (days)	Moisture deficit wheat (mm)	Moisture deficit potatoes (mm)
TG201035	32	1,404	611	118	117	112
TG218025	34	1,393	598	115	118	113

Soils and Agricultural Land Classification

6.7.2.5 In terms of soils and ALC, the Hornsea Three land use and recreation study area crosses four landscape regions of Norfolk. The distribution of the main soil types is identified in volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures, and their descriptions in relation to the four landscape regions are described below.

6.7.2.6 In the north, there is a relatively narrow strip on the Coastal Plain where the soils are developed mainly in Marly Drift and are placed in Association 343g Newmarket 2 (see description below).

6.7.2.7 In the Newmarket 2 Association the drift is overlain by or mixed with a variable thickness of sandy material. This Association is therefore described as a collection of "*Shallow well drained calcareous coarse loamy and sandy soils over chalk rubble associated with well drained deeper coarse loamy and sandy soils often in an intricate pattern. Slight risk of water erosion*".

6.7.2.8 The main limitation of the soils in Association 343g Newmarket 2 is droughtiness because of the relatively limited rooting depth, though typical profiles would be more moisture retentive than very shallow soils developed directly over chalk. Typical Swaffham Prior and Newmarket series soil profiles from this Association would be likely to be graded ALC Grade 2 and Subgrade 3a respectively.

6.7.2.9 The Hornsea Three onshore cable corridor then rises onto the Cromer Ridge which is followed to the south by the so-called Sand-Loam Uplands or the Sand and Gravel Platform. This region extends south as far as Norwich. In both regions, the main parent materials consist of glaciofluvial sands and gravels.

6.7.2.10 Where the soils are formed mainly in these sands and gravels, for example on the Cromer Ridge itself, Associations 551f Newport 3 and 551g Newport 4 are found.

6.7.2.11 The Newport 3 Association (551f) is developed in glaciofluvial drift with little or no superficial aeolian drift. It is described as a collection of "*Deep, well drained sandy and coarse loamy soils. Some coarse and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Risk of wind erosion*". In this description "*fine loamy*" and "*coarse loamy*" mean medium textures, the former tending to heavier, more clayey textures, the latter to lighter, more sandy textures.

6.7.2.12 The well drained sandy and coarse loamy soils are the Newport (formerly Freckenham) and Wick (formerly Hall) series respectively, as described above. The soils with slowly permeable subsoils are found where the superficial covering of sand and gravel is relatively thin and/or partly incorporated with heavier glacial till material and most belong to the coarse loamy Wighill (formerly Attlebridge) series. The glacial till derived horizons in the lower parts of the profiles are responsible for the impeded drainage, the result of which is colour mottling and/or greyish colours in these horizons and immediately above them.

6.7.2.13 The main limitation is droughtiness which is more pronounced in these sandy soils than in the more loamy soils of the Wick Associations. Application of the revised ALC criteria suggest that typical profiles of the Newport (formerly Freckenham) series give land of mainly Subgrade 3b quality, although the more loamy Wighill (formerly Attlebridge) series are likely to give Subgrade 3a.

6.7.2.14 The Newport 4 Association (551g) is developed in glaciofluvial drift with effectively no superficial aeolian drift and so it is probably the sandiest of the Newport Associations. It is described as a collection of "*Deep well drained sandy soils. Some very acid soils with bleached subsurface horizon especially under heath or in woodland. Risk of wind erosion*". The well drained sandy soils are those of the Newport (formerly Freckenham) series. A typical profile of the well-drained sandy soils (i.e. a typical Newport (formerly Freckenham) series) would have a moderately thin, often stony, sandy loam or loamy sand topsoil, overlying loamy sand or sand, becoming pure sand within 40 cm from the surface.

6.7.2.15 The main limitation of the soils is soil droughtiness which is particularly pronounced in these very sandy soils. Application of the revised ALC criteria suggest that typical profiles of the Newport series give land of predominantly Subgrade 3b quality, although some areas of Grade 4 could be possible.

6.7.2.16 Where the sands and gravels are themselves covered by aeolian drift, often referred to as the Norwich Brickearth there is an increase in the occurrence of deeper, more loamy and more moisture-retentive soils, especially in valley bottoms where hill-wash has increased the thickness of the loamy material. These are placed in Associations 541s Wick 2 and 541t Wick 3 which give land predominantly in Subgrade 3a or even Grade 2 where the covering of aeolian drift is relatively thick. However, patches with little or none of this drift (i.e. soils more like those which dominate the Newport Associations), are more likely to be in Subgrade 3b.

6.7.2.17 The Wick 2 Association (541s) is the less prevalent of the two Wick Associations found within the Hornsea Three land use and recreation study area. It is found where the geological map indicates sand and gravel, brickearth (i.e. aeolian drift) and patches of glacial till. It is thus described as being developed in "*glaciofluvial and aeolian drift and till*". It differs from Association 541t Wick 3 in having both a generally greater thickness of loamy surface material and having, in places, soils which are influenced by underlying glacial till (absent in areas of Association 541t Wick 3). Association 541s Wick 2 is described as a collection of "*Deep well drained coarse loamy soils often stoneless. Some similar soils with slowly permeable subsoils and slight seasonal waterlogging. Slight risk of water erosion*". In this description, the term "*coarse loamy*" indicates textures in the sandy loam to sandy silt loam range.

6.7.2.18 The more detailed 1:25,000 scale soil map for the Barningham/Sheringham area shows an assortment of soils of which the well-drained, coarse loamy Wick (formerly Hall) series appears to be the most common. It is, however, variously accompanied by the sandier Newport (formerly Freckenham) series, including some notably stony ones; the deeper Sheringham series; as well as two series showing signs of poor drainage at depth, the Aylsham and Wickmere series, which are both influenced by the presence of slowly permeable glacial till material at depth.

6.7.2.19 The quality of the land is likely to vary from Grade 2 on the deep Sheringham soils, to Subgrade 3a on typical Wick (formerly Hall) series, to 3b on the sandier Newport (formerly Freckenham) series. The poor drainage at depth of the Aylsham and Wickmere series can readily be rectified and in this relatively dry climatic area is not a major limitation. They too suffer mainly from summer droughtiness in this climatic area, but probably would qualify for Grade 2.

6.7.2.20 The Wick 3 Association (541t) is found on sand and gravel but where this is covered, at least in places, by aeolian drift and is dominated by Wick series soils. Association 541t Wick 3's main difference from Association 541s Wick 2 is that it is found where the aeolian drift is thinner and the soils are accordingly more sandy at depth. The generalised description of Association 541t Wick 3 is accordingly that it is a collection of "*Deep well drained coarse loamy often stoneless soils. Some similar sandy soils. Complex soil pattern locally. Risk of water erosion*". In this description, the term "*coarse loamy*" indicates textures in the sandy loam to sandy silt loam range and the term "*sandy*" indicates loamy sand and sand textures.

6.7.2.21 The main limitation of the three main soils from the Wick 3 Association, Wick (formerly Hall), Newport (formerly Freckenham) and Sheringham, is droughtiness and the degree of limitation depends on the thickness of loamy material above the sandy and/or stony substrate. The sandiest and most drought prone Newport Series are most susceptible to droughtiness and are likely to be graded 3b, whilst the Wick (formerly Hall) series has a greater thickness, between 40 and 70 cm, of surface loamy material which would typically give Grade 3a while the Sheringham series with more than 70 cm of loamy material would be in Grade 2.

6.7.2.22 Two nearby areas of this Association south of Holt have been mapped in more detail by MAFF using the revised ALC system and show a mixture of Grade 2, 3a and 3b land.

6.7.2.23 Just north of Salle, the Hornsea Three land use and recreation study area passes southwards onto the Boulder Clay Plateau. These soils are formed in or greatly influenced by the underlying slowly permeable glacial till (boulder clay) and many show signs of impeded drainage. They are categorised as belonging to Associations 572n Burlingham 1 and 572p Burlingham 3. Land quality, as elsewhere on the Hornsea Three onshore cable corridor, is variable with both winter wetness and summer droughtiness having to be taken into account. Detailed surveys of land in these Associations indicate the likelihood of substantial areas of Grade 2 and Subgrade 3a with only minor amounts of Subgrade 3b.

6.7.2.24 The soils of the Burlingham 1 Association are formed in clayey or fine loamy chalky till and Head (a locally derived superficial drift) which partly covers glaciofluvial sands and gravels. This gives a considerable range of soils and the Association is described as a collection of "*Deep coarse and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some deep well drained coarse loamy and sandy soils*". In this description "*fine loamy*" and "*coarse loamy*" mean medium textures, the former tending to heavier, more clayey textures, the latter to lighter, more sandy textures.

6.7.2.25 The soils with the fine loamy textures and slowly permeable subsoils are the Burlingham series *per se*, found in areas dominated by glacial till together with the more clayey Ashley and Hanslope series all of which become chalky at depth. These soils make up between a third and half of the land within the Association. A typical Burlingham series profile has a sandy loam or sandy clay loam topsoil and subsoil, mottled at depth due to the slowly permeable underlying chalky clay (glacial till) which is usually encountered at about 80 cm from the surface. After appropriate drainage, such profiles would be classed as moderately well drained (Wetness Class II).

6.7.2.26 The corresponding coarse loamy soils with slowly permeable subsoils are in the Wighill (formerly Attlebridge) series, and together with the better drained coarse loamy Wick (formerly Hall) series are found on the Head deposits. The deep well drained sandy soils are the Newport (formerly Freckenham) series similar to those already described above.

6.7.2.27 Areas shown as this Association have been the subject of more detailed surveys by MAFF in the 1990s. Although they do not specifically refer to soil series, descriptions of typical soils indicate that there are substantial areas of sandy Newport (formerly Freckenham) series but only relatively small areas of heavier textured soils, possibly Wighill (formerly Attlebridge) series. There is no mention of any soils directly on chalky till or other chalky drift (Ashley and Swaffham Prior series).

6.7.2.28 Most of the likely soils are either well drained or at worst moderately well drained such that any wetness limitation in a climatic regime as dry as round Norwich would be minimal. Thus, the main limitation is droughtiness, with a mixture of predominantly Grade 3a and 3b land.

6.7.2.29 Within Association Burlingham 3 (572p), typical soils of this Association are formed in clayey or fine loamy chalky till and Head (a locally derived superficial drift). These tend to have impeded drainage but the Association also includes better drained soils formed in sandy glaciofluvial sands and gravels. Thus, Association 572p Burlingham 3 is described as a collection of "*Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar fine or coarse loamy over clayey soils. Some deep well drained coarse loamy over clayey, fine loamy and sandy soils*". In this description "*fine loamy*" and "*coarse loamy*" mean medium textures, the former tending to heavier, more clayey textures, the latter to lighter, more sandy textures.

6.7.2.30 Significant areas of the land in this Association within the Land Use and Recreation study area have been the subject of detailed surveys carried out by MAFF in the 1990s. Although they do not use series names it would seem that, in general, only two main soil types are considered to be present. The first consists of soils which have developed over underlying chalky boulder clay drift. Typical profiles have a slightly stony sandy loam or sandy clay topsoil overlying similar or sometime stonier upper subsoils which in turn overlie clayey lower subsoils below 40-75 cm depth. In many locations, the clay overlies a friable chalky drift below approximately 80 cm. These profiles are typically non-calcareous in the upper horizons and become calcareous as the underlying chalky drift is approached. Soil drainage is assessed predominantly as wetness class II with smaller areas of wetness class III and I. Such soils are similar to those described in other publications as the Burlingham series *per se* (i.e. the "*deep fine loamy soils with slowly permeable subsoils*" of the generalised description of the Association).

6.7.2.31 The second main soil type occurs where the parent material is glacial sand and gravel. The well drained soils typically comprise variably stony, sandy loam, or less frequently loamy sand topsoils over similar or lighter, slightly or moderately stony subsoils which may extend to depth or overlie gravel below 40 - 60 cm from the surface. These are the "*deep well drained coarse loamy and sandy soils*" of the Newport (formerly Freckenham) series found frequently elsewhere along the entire Hornsea Three land use and recreation study area.

6.7.2.32 The better drained of the Burlington type soils have been placed in Grade 2 and are considered to be limited by minor winter wetness and summer droughtiness constraints. The heavier, stonier or wetter examples are Subgrade 3a, as are soils said to be transitional between the Burlington and Newport series. The more typical sandy Newport soils are classed as Subgrade 3a and 3b.

6.7.2.33 Where the Hornsea Three land use and recreation study area crosses the valleys of the Glaven, Bure, Wensum and Yare and their main tributaries the soils are poorly or very poorly drained and often peaty. Three Associations, 861b Isleham 2, 871c HANWORTH and 1024b ADVENTURERS 2, are encountered all giving land generally no better than Grade 4.

ALC Survey

6.7.2.34 ALC survey work has been undertaken across the range of soil types identified throughout the Hornsea Three land use and recreation study area, based on the published information and available access arrangements, to enable the typical soils and likely distributions of ALC Grades that exist within the soil Associations throughout the study area to be identified. Figure 1.1 of volume 6, annex 6.1: Agricultural Land Classification Published Data shows the location of the survey areas overlaid on to the published soils information. The location of the individual survey auger borings within each of the areas is shown on Figure 1.1 of volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures together with the distribution of the ALC Grades within each of the areas. The nature of the soils identified and the resulting distribution of ALC Grades is discussed, with reference to each of the areas below.

<u>Area 1</u>

Area 1 – North (Landfall)

6.7.2.35 The published soils information indicates that this survey area comprises soils from Newmarket 2 Association (343g). The area of survey, includes the former site of the Weybourne camp and the survey identified a considerable degree of disturbance in some areas of the land surveyed. The majority of the soils showed inclusions of brick and tarmac pieces, but those profiles which remained relatively undisturbed comprised two soil profile types. The first profile type comprises a medium sandy loam topsoil, overlying similar upper subsoils, with loamy medium sand and medium sand at depth. These deeper, sandy profiles occasionally become calcareous with chalky material included at depths of 70-80cm depth. The second profile type, comprises a medium sandy loam topsoil, overlying a similar upper subsoil and a chalky marl lower subsoil at depths of between 45-65cm. These profiles are graded mainly 3a with smaller areas of Grade 3b according to a droughtiness limitation

6.7.2.36 The disturbed soil profiles observed within this survey area comprised one or more of the following characteristics:

- A high percentage of brick and tarmac and stone within the topsoil; and
- Soil mixing evident throughout the profile. Several profiles contained evidence of buried topsoils and subsoils which lie below a horizon of mixed material that had been replaced on top of the original profile.

6.7.2.37 The profiles are generally graded 3b, but there is an area of recently restored land to the west of the survey area, where profile characteristics vary within a short distanced, there is soil mixing, inclusions of high volumes of stone/brick within the profile and compaction within the profiles. This area has been assessed as Grade 4.

6.7.2.38 The distribution of ALC Grades within this survey area are therefore as set out in Table 6.8:

Table 6.8: Survey Area 1 North (Landfall) – ALC Grades

Grade	Area(ha)	Percentage (%)
3a	3.65	58
3b	1.71	27
4	0.94	15

Area 1 – South

6.7.2.39 The published soils information indicates that the majority of this survey area comprises soils from Wick 3 Association (541t) with a small area of Wick 2 Association (541s) to the north and a transitional area at the far south, where sandier soils of the Newport 4 Association (551g) may be located.

6.7.2.40 The northern part of the area is characterised by soil profiles comprising medium sandy loam topsoils and upper subsoils with approximately 3-5% stone, overlying stonier similar textured lower subsoils, sometimes with loamy medium sand and medium sand horizons between 60 – 90 cm below the surface. These profiles are slightly limited by droughtiness to ALC Grade 2.

6.7.2.41 Further south, the presence to the loamy drift material becomes slightly shallower, with profiles commonly comprising medium sandy loam topsoil (3% stone) either directly over a loamy medium sand upper subsoil or a shallow medium sandy loam upper subsoil overlying a loamy medium sand lower subsoil. These profiles are slightly more drought prone and limited to ALC Grade 3a. These profiles appear to be consistent with the transition from the Wick 3 Association and the Newport 4 Association which is identified on the southern fringe of this survey area, although these soils are still more characteristic of the Wick 3 Association.

6.7.2.42 The areas and percentages of Grades within this area of Wick 3 and Wick 2 Association soils is therefore as set out in Table 6.9 and Table 6.10.

Table 6.9: Survey Area 1 (South) – Wick 3 Association.

Grade	Area (ha)	Percentage (%)
2	16.38	68
3a	7.75	32

Table 6.10: Survey Area 1 (South) – Wick 2 Association.

Grade	Area (ha)	Percentage (%)
2	3.28	100

Area 2

Area 2 – North

6.7.2.43 The published soils information indicates that this survey area comprises soils from the Wick 3 Association (541t). This area is also shown on the 1:25,000 sheet for (Soils of Norfolk 2) which indicates variants within this area including sandier and stonier soils of the Freckenham Series, together with the presence of deeper soils of the Hall and Sheringham series.

6.7.2.44 The main areas of Grade 2 land identified are on lower lying parts of the survey area where soils are deeper and loamy with limited volumes of stone throughout. The larger areas are situated close to Barningham Green plantation and to the west of Shrubbs Farm. Typically, profiles comprise medium sandy loams or sandy silt loams overlying similar upper subsoils, with fine sand or loamy fine sand horizons at depth. These profiles are limited by a slight droughtiness and/or stoniness limitation to Grade 2.

6.7.2.45 The larger areas of Grade 3a within this survey areas are characterised by sandier soils where the soil profile typically comprises a medium sandy loam topsoil and shallow upper subsoil with 5 – 10% stone, overlying a loamy medium sand lower subsoil either to depth or overlying medium sand at depth. Typically, the lower subsoils become grittier with increased stone content. These soils are limited by droughtiness to Grade 3a, with topsoil stoniness also affecting a proportion of individual profiles.

6.7.2.46 In addition, there are areas of land close to New Covert and also at the southern edge of this survey area where stone contents are notably higher, with evidence of stone picking apparent in these fields. Topsoil stone sieving confirmed that stone contents are in excess of 15% in these areas and this, combined with shallow sandy soils overlying gritty reddish brown medium and coarse sands at depths of around 40 cm depth limits these profiles to Grade 3b on the basis of droughtiness and/or topsoil stoniness.

6.7.2.47 This survey area includes the proposed location of the onshore HVAC booster station and permanent landscaping areas where the distribution of ALC Grades is as set out in Table 6.11.

Table 6.11: Onshore HVAC booster station - ALC Grades

ALC Grade	Area (ha)	Percentage (%)
2	1.71	25
3a	4.36	63
3b	0.84	12

Area 2 – South

6.7.2.48 The published soils information indicates that the majority of this survey area comprises soils from the Wick 3 Association (541t) with a limited area Wick 2 Association (541s) at the southern end.

6.7.2.49 Within the area characterised by the Wick 3 Association, the variation in soil profile characteristics and ALC gradings are similar to those observed for Area 2 North above. The dominant grading is Grade 3a main due to soil droughtiness. Smaller areas of Grade 2 land are identified where loamy soils are deeper and stone contents are lower. Areas of particularly sandy and stony soils are identified close to Bell's Grove and south of the dismantled railway close to Little London and these are ALC Grade 3b, due to either a more severe droughtiness and/or topsoil stoniness limitation.

6.7.2.50 The land at the southern part of this survey section, characterised by soils of the Wick 2 Association, also comprises soils where sandier soils are limited by droughtiness predominantly to Grade 3a. However, at the most southern part of this section the profiles comprise slightly heavier textured sandy clay loam and sandy clay horizons at depth which are less drought prone and eligible for ALC Grade 2. A typical profile comprises a medium sandy loam or medium clay loam topsoil, overlying a similar upper subsoil with lower subsoil horizons of sandy clay loam or sandy clay at depth.

6.7.2.51 The percentage of Grades within the Wick 2 and Wick 3 Soil Associations as surveyed in Section 2 (North and South) are as set out in Table 6.12, Table 6.13 and Table 6.14.

Table 6.12: ALC Survey Area 2 North – Wick 3 Association.

Grade	Area (ha)	Percentage (%)
2	8.38	20
3a	23.98	58
3b	9.20	22

Table 6.13: ALC Survey Area 2 South – Wick 3 Association.

Grade	Area (ha)	Percentage (%)
2	5.40	41
3a	6.27	48
3b	1.36	11

Table 6.14: ALC Survey Area 2 South – Wick 2 Association.

Grade	Area (ha)	Percentage (%)
2	5.40	42
3a	6.27	48
3b	1.36	10

Area 3

6.7.2.52 The published information indicates that this area comprises the coarse loamy and sandy soils of the Newport 3, 551f, Soil Association. The survey work has identified a notable difference here in the typical soil profiles found compared to the profiles from the survey work in Area 4 where the sandier Newport 4 association soils are identified. There is a considerable mix of soil profile types in Area 3, but generally they are slightly heavier textured than the particularly sandy soils of the Newport 4 Association, which accords with the description provided in the published information.

6.7.2.53 The main soil profile types are described as follows:

- Medium sandy loams or sandy clay loams overlying similar subsoils, becoming sandier with depth. These are Grade 2 based on a slight droughtiness limitation;
- Medium sandy loam topsoils overlying a shallow medium sandy loam upper subsoil and a stonier (10%) loamy medium sand lower subsoil. These profiles are subject to a more severe droughtiness limitation and are graded 3a; and
- Medium sandy clay loams overlying mottled sandy clay loam or sandy clay upper subsoils and a greyish slowly permeable clay at depth. These soils are Wetness Class III and graded 3a according to a soil wetness limitation.

6.7.2.54 Area 3 therefore comprises a mixture of mainly Grade 3 and a smaller proportion of Grade 2 land. The percentages of Grades within this area of Newport 3 (551f) Association is therefore as set out in Table 6.15.

Table 6.15: ALC Survey Area 3 – Newport 3 Association.

Grade	Area (ha)	Percentage (%)
2	3.84	20
3a	15.71	80

Area 4

6.7.2.55 The published information indicates that this area comprises sandy soils from the Newport 4 551g Soil Association. The survey work has confirmed that the whole survey area does comprise uniformly sandy soils that are limited by droughtiness to Grade 3b. Typical profiles comprise loamy medium sand topsoils with approximately 5-10% topsoil stone, overlying similar upper subsoils and medium to coarse sand subsoils with similar stone contents. One or two profiles at the southern end of the survey area comprise borderline medium sand topsoils which would be graded individually as Grade 4, but the overall grading of the area is identified as Grade 3b.

6.7.2.56 The percentage of Grades within this area of Newport 4 (551g) is therefore summarised in Table 6.16.

Table 6.16: ALC Survey Area 4 – Newport 4 Association.

Grade	Area (ha)	Percentage (%)
3b	44.69	100

Area 5

6.7.2.57 This survey section comprises predominantly soils from the Burlingham 1 (572n) Soil Association, together with a crossing of the River Yare at the northern part where a strip of Isleham 2 Soil Association (861b) is identified.

6.7.2.58 Within the Burlingham 1 Association area, the long section Hornsea Three onshore cable corridor north of Church Farm Barns is dominated by sandy soils, prone to droughtiness. The individual profiles are limited to Grade 3a or 3b according to the severity of this limitation. A typical Grade 3a profile comprises a medium sandy loam topsoil with 5% stone over a similar upper subsoil, with stonier and gritty loamy medium sand and medium sand lower subsoils.

6.7.2.59 Grade 3b soil profiles limited by drought comprise sandier horizons closer to the surface, with loamy medium sands topsoils occurring over similar subsoils and medium sand lower subsoils. These profiles are more characteristic of the Newport Series description.

6.7.2.60 The Burlingham Association soils to the south of Church Farm Barns running east towards Little Melton are heavier in texture and are more characteristic of the Burlingham series where the land is dominated by glacial till and soils become chalky at depth. Profiles comprise typically sandy clay loam/medium clay loam (occasional heavy clay loam) topsoils over mottled sandy clay loam/sandy clay/clay upper subsoils and slowly permeable clay lower subsoils becoming calcareous at depth. These profiles are Wetness Class III and Grade 3a, according to a wetness limitation.

6.7.2.61 The percentage of ALC Grades within this area of Burlingham 1 Association is therefore as set out in Table 6.17.

Table 6.17: ALC Survey Area 5 – Burlingham 1 Association.

Grade	Area (ha)	Percentage (%)
3a	26.27	63
3b	14.78	37

6.7.2.62 The strip of land alongside the River Yare where the Isleham Association soils are identified comprises heavy textured and poorly drained soils within this low-lying floodplain area. Profiles comprise peaty topsoils over wet mottled grey silty clay subsoils. These profiles in this location are Grade 4 according to wetness and susceptibility to flooding.

6.7.2.63 The percentage of ALC Grades within this area of Isleham Association soils is therefore as set out in Table 6.18.

Table 6.18: ALC Survey Area 5 – Isleham Association.

Grade	Area (ha)	Percentage (%)
4	3.0	100

Area 6 HVDC converter/HVAC substation

6.7.2.64 The survey of the substation area has identified a similar pattern of soils to that surveyed by Defra on the surrounding land. The majority of the land is classified as Grade 3a, with profiles typically comprising a sandy clay loam or medium clay loam overlying a mottled sandy clay loam or medium to heavy clay loam upper subsoil and a slowly permeable clay lower subsoil, becoming calcareous at depth. These profiles are subject to soil wetness (Wetness Class III) and accordingly graded 3a. There is a small area of land to the north east of the proposed substation where profiles are deeper and better drained comprising sandy clay loam topsoils and upper subsoils, overlying a chalky medium clay loam at depth. These profiles are subject to a slight droughtiness limitation and graded 2 accordingly.

6.7.2.65 The areas and percentages of ALC Grades within the permanent footprint of the HVDC converter/HVAC substation are as set out in Table 6.19.

Table 6.19: ALC Survey Area 6 - onshore HVDC converter/HVAC substation ALC Grades.

Grade	Area (ha)	Percentage (%)
2	2.53	14
3a	14.66	85
Non-Agricultural	0.13	1
TOTAL	17.32	100

Survey Area 6 (excluding HVDC converter/HVAC substation)

6.7.2.66 Areas of Grade 3a and 2 within the wider survey area comprise similar soil types of those described for the substation above (paragraph 6.7.2.64). However, at the far western end of this survey area, an area of particularly sandy soils has been identified, where the crop was noticeably struggling at the time of survey. The profiles in this area are graded 3b according to a moderately severe droughtiness limitation.

6.7.2.67 Taking this and the area of the HVDC converter/HVAC substation surveyed into account, the percentage of Grades within the Burlingham 3 (572p) soil type characteristic of Survey Area 6 is as set out in Table 6.20.

Table 6.20: Total Area of ALC Survey Area 6 – Burlingham 3 Association.

Grade	Area (ha)	Percentage (%)
2	10.24	19
3a	38.25	72
3b	4.95	9

6.7.3 Recreation

The Coast (see Figure 6.2)

6.7.3.1 The shingle beach at Weybourne is primarily noted for fishing. Anglers can park in the beach side car park from which there is direct access onto the beach (www.visitnorfolk.co.uk). Fishing takes place from the beach or from boats that are pulled up onto the beach when not in use. The catch includes the usual species common to the Norfolk shingle including flatfish ('flatties'), along with codling and whiting during the winter. Details of coastal fishing activities are contained in volume 2, chapter 6: Commercial Fisheries and volume 2, chapter 11: Infrastructure and Other Users.

6.7.3.2 The steeply shelving beach makes it more difficult for swimming as the water gets deep quickly, although the beach is available for general outdoor recreational use including walking and is dog friendly. Apart from the car park there are no other visitor facilities on or adjacent to the beach, except for the Peddars Way and Norfolk Coast Path National Trail described below.

Access Land (see Figure 6.2)

6.7.3.3 Access land, as defined by the Countryside and Rights of Way Act 2000 (the CROW Act) and as mapped by the Countryside Agency (now Natural England), comprises open country (predominantly mountain, moor, heath, and down) and registered common land. The Hornsea Three onshore cable corridor runs adjacent to the western edge of areas of access land at Muckleburgh Hill and Kelling Heath, to the east of Kelling. Kelling Heath is also designated as a SSSI (for SSSI boundary see chapter 3: Ecology and Nature Conservation) covering approximately 90 ha. In the reasons for notification it states that *"Kelling Heath provides perhaps the best example of glacial outwash plain in England",* and is *"a fine example of oceanic heathland"*.

6.7.3.4 The Hornsea Three onshore cable corridor then crosses the southern part of an area of dedicated access land (under Section 16 of the CROW Act) at Bodham Wood, a Forestry Commission England wood covering over 39 ha.

6.7.3.5 At Alderford, the Hornsea Three onshore cable corridor runs adjacent to the western corner of Alderford Common which lies to the south of the village of Alderford. The site forms registered common land parcel CL186. It offers a diverse flora, including species-rich chalk grassland, and is also designated as a SSSI. There is a small car park on the Reepham Road just east of Alderford village.

6.7.3.6 There is no access land within the footprint of either the onshore HVAC booster station or the HVDC converter/HVAC substation.

Recreational Resources (see Figure 6.2)

6.7.3.7 Selecting the location and layout of Hornsea Three has been done to minimise impacts on recreational resources (see volume 1, chapter 4: Site Selection and Consideration of Alternatives). However, a number of recreational resources are located within or close to the Hornsea Three land use and recreation study area, including the following:

- A coastal car park, approximately 400 m east of the onshore cable corridor, is accessed from Beach Lane to the north of Weybourne;
- A construction access runs alongside the Foxhills camping site, which is approximately 500 m south of the onshore cable corridor, located to the north of the A149, west of Weybourne;
- The Muckleburgh Military Collection, is sited on the former Royal Artillery Anti-Aircraft training camp at Weybourne and lies approximately 250 m to the south of the Hornsea Three onshore cable corridor. Its website states that it was opened to the public in 1988 and is the largest privately-owned military Museum in the United Kingdom with an extensive range of tanks and armoured cars and exhibits of artillery, machine guns, missiles, ships and land warfare models. The museum is

open daily from the end of March to the end of October. Construction accesses to the landfall site run along the main access to the Collection and on tracks within its land to the north;

- The North Norfolk Railway, which offers a nearly 17 km round trip by steam train or vintage diesel train between Sheringham and Holt, with stations at Weybourne and Kelling Heath Park, is crossed by the Hornsea Three onshore cable corridor. The railway runs three timetables, with services running from February to November;
- Kelling Heath Holiday Park, which offers accommodation in woodland lodges, luxury holiday homes and homes for those with limited mobility, together with touring and camping facilities lies approximately 100 m to the north of the Hornsea Three onshore cable corridor at its nearest point. The Park has a range of other facilities including a health and fitness club, an outdoor pool, tennis courts, an eco-gym, adventure playgrounds, a village store and laundrette. It also has a network of footpaths and several self-guided trails and offers a cycle hire service. One pedestrian route into the Holiday Park is along Warren Road, which is crossed by the Hornsea Three onshore cable corridor and part of it used as a construction access;
- Baconsthorpe Castle, which is a Scheduled Monument, which lies approximately 340 m to the east of the Hornsea Three onshore cable corridor. The extensive ruins of the moated and fortified 15th century manor house, gatehouse, courtyards and formal gardens are open to the public at no cost during daylight hours. The site is also Section 15 land under the CROW Act (i.e. land where pre-existing public access rights that on CROW access land apply instead of the CROW rights);
- The River Bure at Corpusty, the River Wensum at Attlebridge, the River Tud at Easton and the River Yare at Marlingford are all crossed by the Hornsea Three onshore cable corridor. The Wensum and Yare are popular for fishing and water-based activities such as canoeing and kayaking;
- Salle Park, which lies approximately 16 m east of the Hornsea Three onshore cable corridor and one of the storage areas. The gardens are open to guided tours by appointment;
- The Church of St Peter and St Paul at Salle built in 1400, lies approximately 500 m to the east of the Hornsea Three onshore cable corridor. Services are held twice a month;
- Booton Common nature reserve lies approximately 360 m to the west of the Hornsea Three onshore cable corridor and is open to the public daily;
- The Church of St Michael and all Angels at Booton lies immediately adjacent to the Hornsea Three onshore cable corridor. The decorative, Grade 2 listed church was the creation of the Reverend Whitwell Elwin, a descendant of Pocahontas of Hiawatha fame, and is described as a “gothic fantasy”. It is open daily;
- The Church of St Faith at Little Witchingham lies approximately 400 m to the west of the Hornsea Three onshore cable corridor. The church is now in the care of the Churches Conservation Trust and is open every day;
- The Church of St John the Baptist at Alderford, built in 1200, lies approximately 250 m to the east of the Hornsea Three onshore cable corridor. Services are held every Sunday;
- The Church of All Saints at Mill Road, Little Melton lies approximately 300 m to the north of the Hornsea Three onshore cable corridor. Services are weekly on a Sunday and every Tuesday;
- Mangreen Country House is located to the immediate east of the Hornsea Three onshore cable corridor and south of the onshore HVDC converter/HVAC substation. This offers bed and breakfast accommodation, a conference centre, meeting rooms and ancillary facilities such as a swimming pool complex and coffee shop. It also runs retreats, training and courses; and
- Gowthorpe Manor which provides holiday accommodation located approximately 450 m to the west of the onshore HVDC converter/HVAC substation.

Public Rights of Way (see Figure 6.2)

6.7.3.8 Two National Trails are located within the Hornsea Three land use and recreation study area:

- The England Coast Path, a new National Trail around the English Coast which is being opened in sections. The section from Sea Palling to Weybourne is now open to the public and can be accessed from the car park on Beach Lane in Weybourne. This runs along the PRoW Weybourne FP7 approximately 400 m to the east of the landfall area and is not crossed by the Hornsea Three onshore elements; and
- The Peddars Way and Norfolk Coast Path National Trail runs west along Weybourne FP7 from its junction with the England Coast Path in Weybourne and comprises two long distance walking trails, the Peddars Way and the Norfolk Coast Path. The Peddars Way starts in Suffolk at Knettishall Heath Country Park and meets the Norfolk Coast Path at Holme-next-the-Sea. The majority of the Trail runs through the Norfolk Coast AONB. This route is crossed by the onshore elements at the landfall location.

6.7.3.9 In addition to the National Trails, a number of local PRoWs are crossed by the Hornsea Three onshore cable corridor (see Figure 6.2). These are listed below with their appropriate definitive map reference number. No National Trails or other PRoW cross the sites of the onshore HVDC converter/HVAC substation.

- Kelling RB4, which runs in a north-south direction between the A149 Weybourne Road and Holgate Hill;
- Kelling FP15, which runs along the southern side of the North Norfolk railway line from its junction with Weybourne FP1 and Kelling FP5;
- Kelling FP6, which runs southwards between its junction with Weybourne FP1 and Bridge Road in High Kelling;
- Kelling FP9, which runs in an easterly direction from its junction with Kelling FP6 and Bodham FP2;
- Hempstead FP10, which runs eastwards from Marlpit Lane in Hempstead to School Lane;
- Hempstead BR15, which runs westwards from Hempstead Road and Hempstead BR15 to Chapel Lane. The Holt-Mannington Walk runs along BR15 at this location. This 29 km circular walk runs between Holt Country Park and the Mannington Estate and is also crosses by along Hempstead FP10;
- Baconsthorpe FP15, which runs east-west between Hempstead FP8 at Beckett’s Farm to Hall Lane where it turns north to meet Baconsthorpe FP1. This is a locally promoted route;

- Plumstead BR6, which runs eastwards from its junction with Little Barningham BR1 at Little Wood to Plumstead BR4;
- Little Barningham BR1, which runs southwards along the western boundary of the Hornsea Three onshore cable corridor from its junction with Plumstead BR6;
- Corpusty FP19, which runs in a south easterly direction from Edgefield Road to the B1149 Norwich Road to the north of Saxthorpe;
- Corpusty FP20, which runs in a south westerly direction from the B1149 Norwich Road to the north of Saxthorpe to Briston Road;
- Corpusty FP2, which runs in a generally south easterly direction from Briston Road to Croft Lane to the west of Saxthorpe and Corpusty;
- Wood Dalling FP3, which runs in a south westerly direction from Blackwater Lane to Crabgate Lane, Norton Corner;
- Salle BR4, which runs in a westerly direction from Reepham Road;
- Salle FP8, which runs north-south between The Street in Salle to Reepham Road;
- Reepham FP18, which runs southwards from the B1145 Cawston Road to the railway line and then westwards to meet Reepham FP19;
- Booton FP1, which runs in a general south westerly direction from Booton Lane outside Cawston to The Street in Booton;
- Booton FP2, which runs south east from Church Road to Grove Lane;
- Little Witchingham FP6, which runs east-west between Reepham Road and Church Road;
- Little Witchingham FP2, which runs generally in an easterly direction between Church Road and Reepham Road;
- Weston Longville FP9, which runs in a south westerly direction from Church Hill Lane to Telegraph Hill;
- Little Melton FP2, which runs in a generally north-south direction between Great Melton Road and Little Melton Road;
- Hethersett FP6, which runs in a general east-west direction to the north of the railway line between Cantley Lane and Station Cottages Service Road;
- Ketteringham BR2/Keswick BR3, which runs in an east-west direction between Cantley Lane and Intwood Lane;
- East Carleton FP1, which runs generally northwards from its junction with East Carleton FP2.;
- East Carleton FP2, which runs north-south from Intwood Lane to Swardeston Lane;
- Swardeston BR9, which runs north-south from Mangreen to its junction with Swainsthorpe BR7; and
- Swardeston BR12/Stoke Cross BR3, which runs east-west from the A140 Ipswich Road to its junction with Swardeston BR9.

Other Linear Routes (see Figure 6.2)

6.7.3.10 The Hornsea Three onshore cable corridor crosses National Cycle Network Route 1 (NR1) at Attlebridge, which follows the alignment of a disused railway line at this location. NR1 is a long-distance cycle route connecting Dover and the Shetland Islands, via the east coast of England and Scotland. It links to a local cycle route running along Station Road to the east. NR1 is also known as the Marriott's Way in this area. The onshore cable corridor also crosses the Marriott's Way at Reepham. The Marriott's Way is a 42 km footpath, bridleway and cycle route, which follows the routes of two disused railway lines and runs between the town of Aylsham and the city of Norwich.

6.7.3.11 Other promoted cycle and pedestrian routes crossed by the Hornsea Three onshore cable corridor are:

- Sustrans Regional Cycle Route 30 (RR30) is crossed by the Hornsea Three onshore cable corridor on Church Road in the parish of Bodham. This is an on-road route between Cromer and Wighton;
- The Holt Explorer Loop/Norfolk Coast Explorer Loop on Holgate Hill south of Weybourne; on Church Road in Bodham and on Hempstead Road in Hempstead;
- Bickling to Cawston Cycle Route along Blackwater Lane in Heydon and Reepham Road in Salle. It also runs alongside the cable route on Crabgate Lane North in Heydon;
- Around Swannington Cycle Route on Church Road in Booton and on Hall Road in Alderford;
- Around Ringland Cycle Route on The Street in Attlebridge, Ringland Lane in Weston Longville and Honingham Lane and Weston Road south of Ringland. It also runs alongside Ringland Lane south of Weston Longville;
- Cringleford to Sprowston Pedalway along Norwich Road in Hethersett; and
- The Tas Valley Way along Intwood Lane between East Carleton and Intwood.

6.7.3.12 There are a number of informal paths located landwards from the coast to the north west of Weybourne which would be crossed by the Hornsea Three onshore cable corridor in the vicinity of the Hornsea Three landfall area, and used for access by construction traffic. These are located within the land associated with the private Muckleburgh Military Collection and are not available for public access other than by visitors to the museum who, amongst other things, can drive a tracked vehicle (tank). Consultation is ongoing with the museum to minimise any disruption to the facility should construction works being undertaken during the period between March and October when the museum is open. Further south, informal routes within the Kelling Heath Holiday Park would not be affected by the onshore cable corridor works.

6.7.3.13 At Marlingford and Little Melton the Hornsea Three onshore cable corridor crosses permissive bridleway routes associated with Great Melton Farms environmental stewardship scheme. At Marlingford, the permissive bridleway runs alongside Bawburgh Road and at Little Melton the routes run along Market Lane, a track leading south from Market Lane and along the alignment of Little Melton FP2. These access arrangements are due to end on 31 July 2018.

6.7.3.14 The onshore HVAC booster station and HVDC converter/HVAC substation areas are not crossed by any linear routes.

6.7.3.15 In addition, the Hornsea Three onshore cable corridor crosses the following routes marked as 'recreational routes' on OS mapping and other local roads that are available for use by all travellers:

- A route along Blackbreck Lane to the west of Ringland. This is an unsurfaced Norfolk County Council maintained road;
- A route along Sandy Lane to the south of Ringland. This is an unsurfaced Norfolk County Council maintained road; and
- A route along Broom Lane to the south of Easton. This is an unsurfaced Norfolk County Council maintained road.

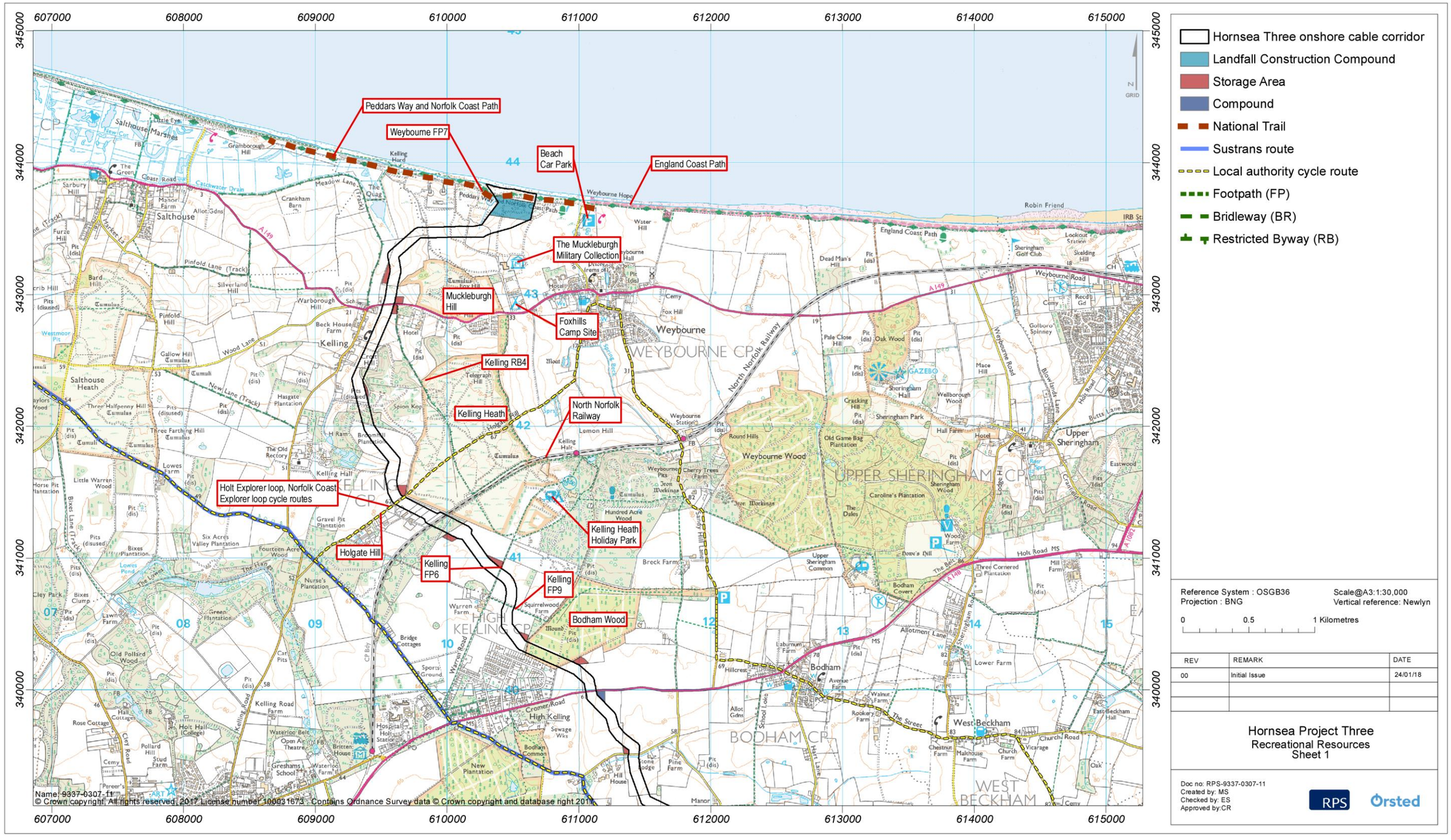

Figure 6.2: Recreational resources.

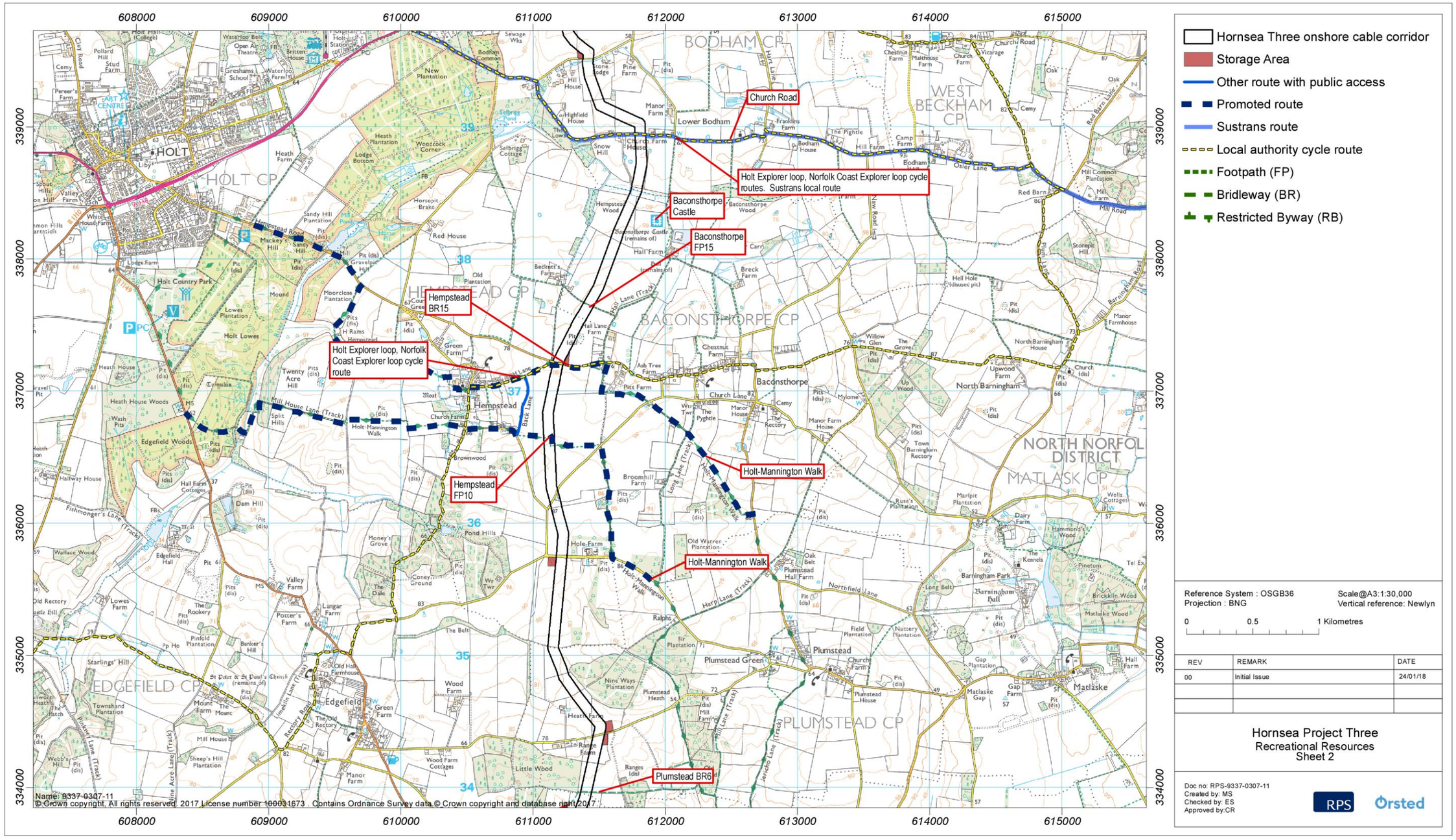

Figure 6.2: Recreational resources.

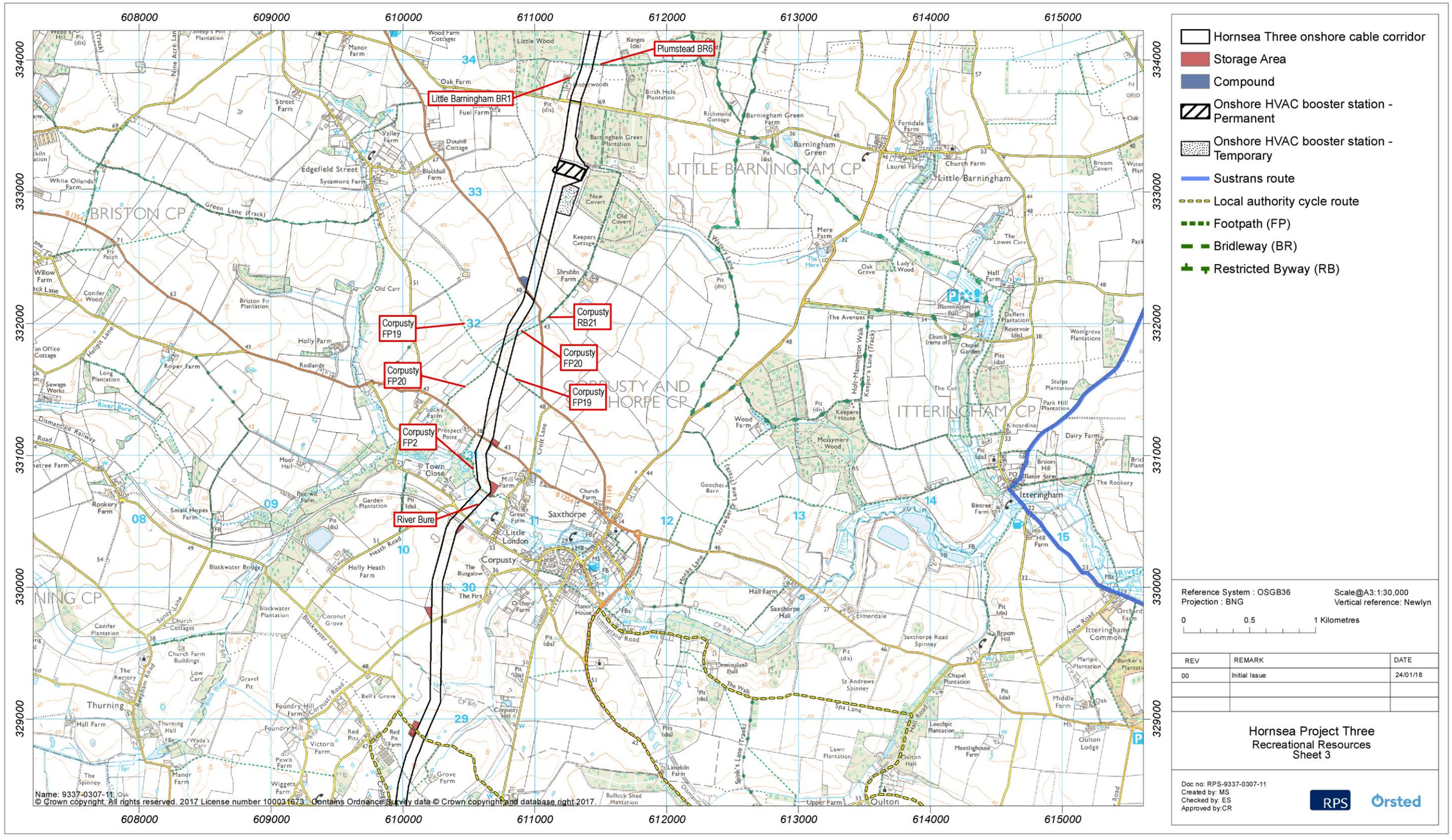

Figure 6.2: Recreational resources.

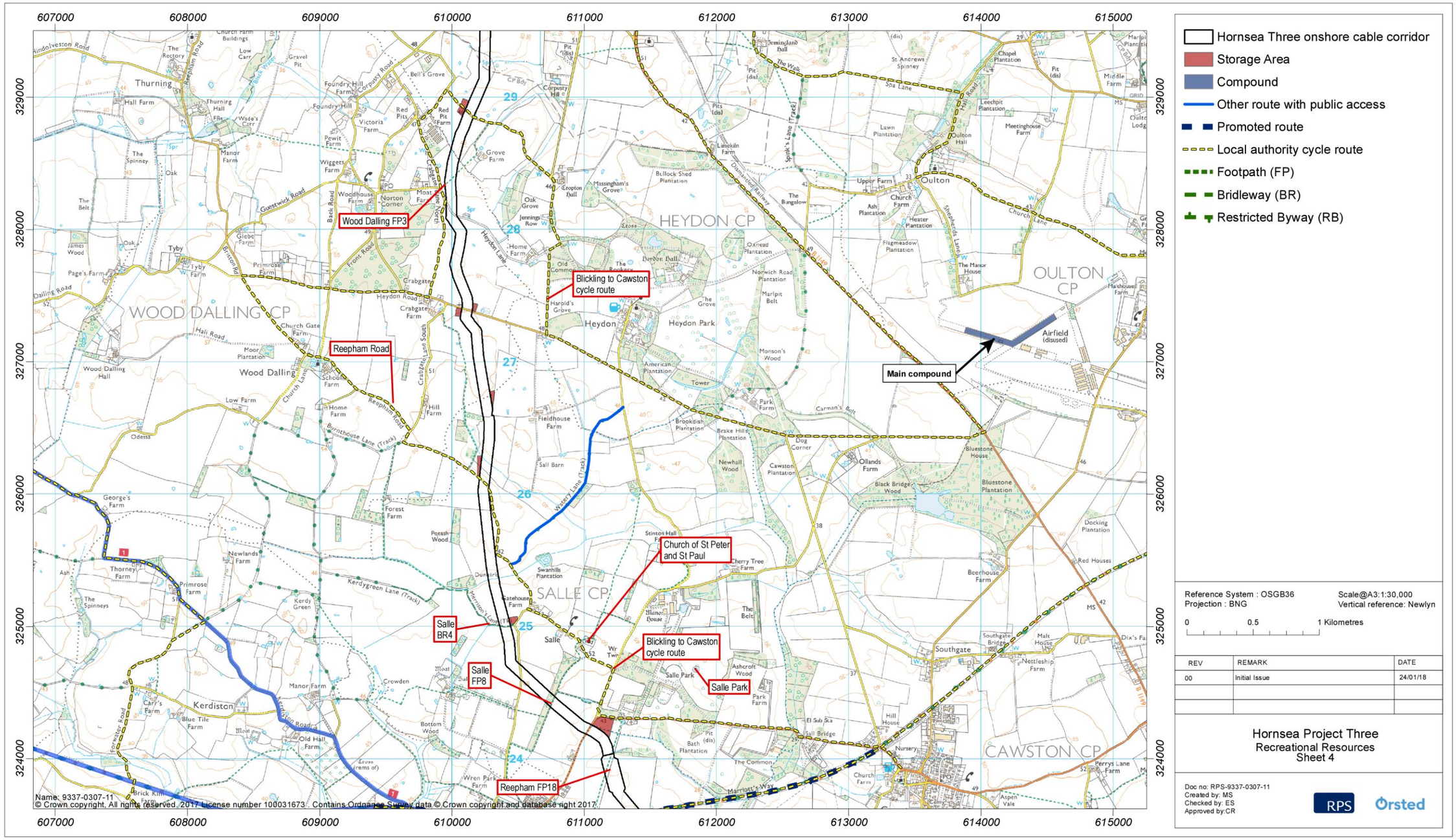

Figure 6.2: Recreational resources.

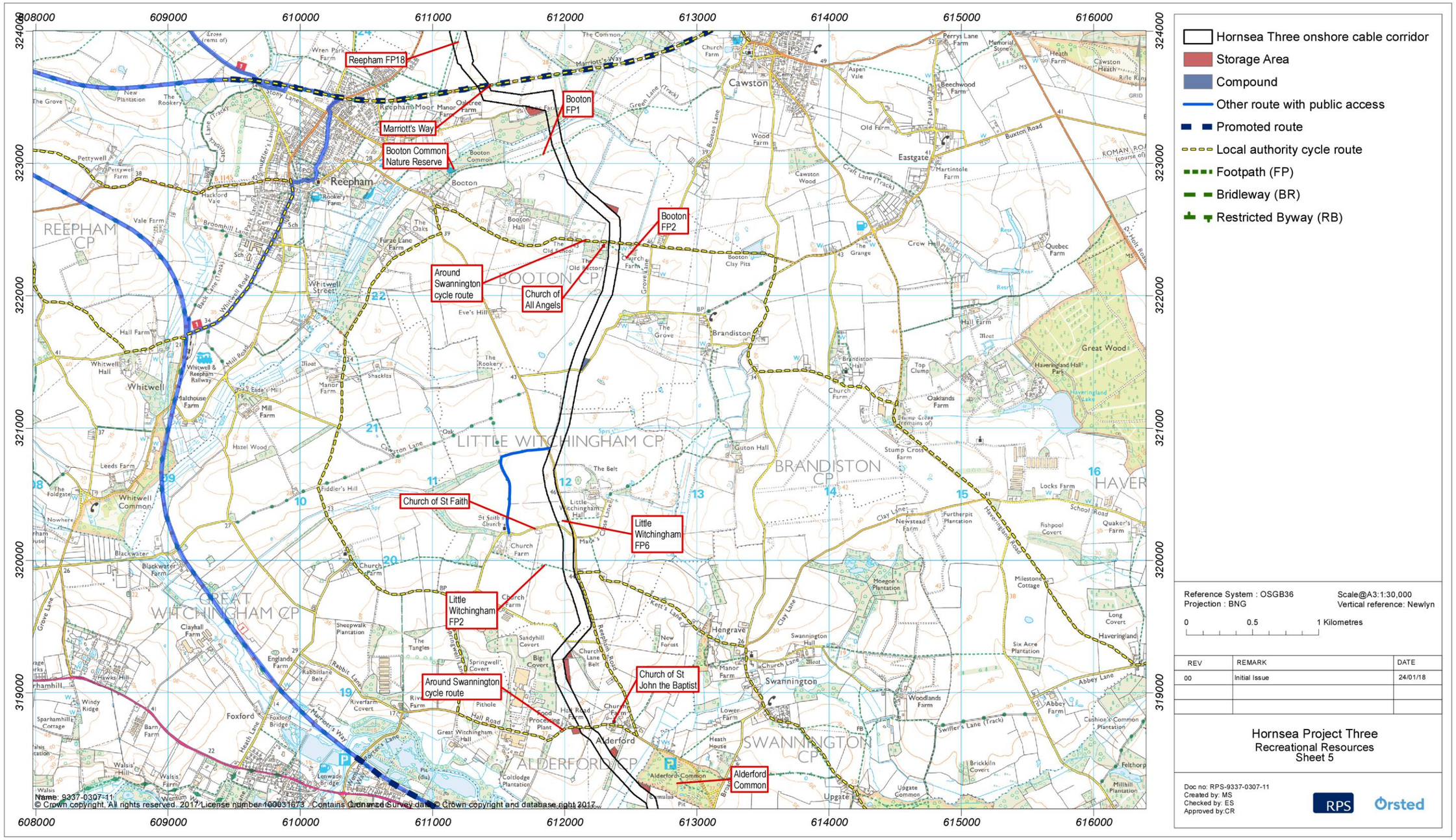

Figure 6.2: Recreational resources.

Figure 6.2: Recreational resources.

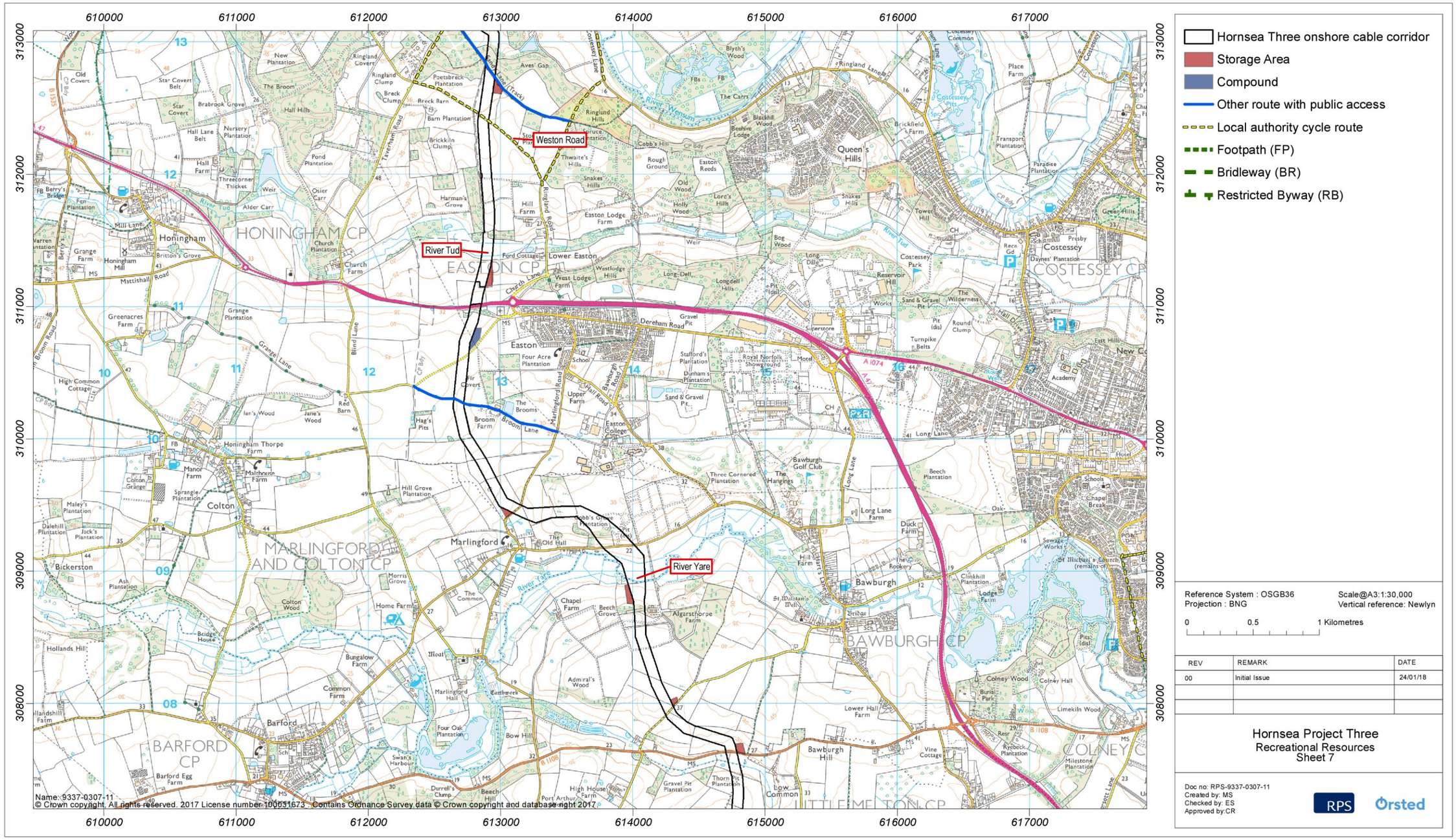

Figure 6.2: Recreational resources.

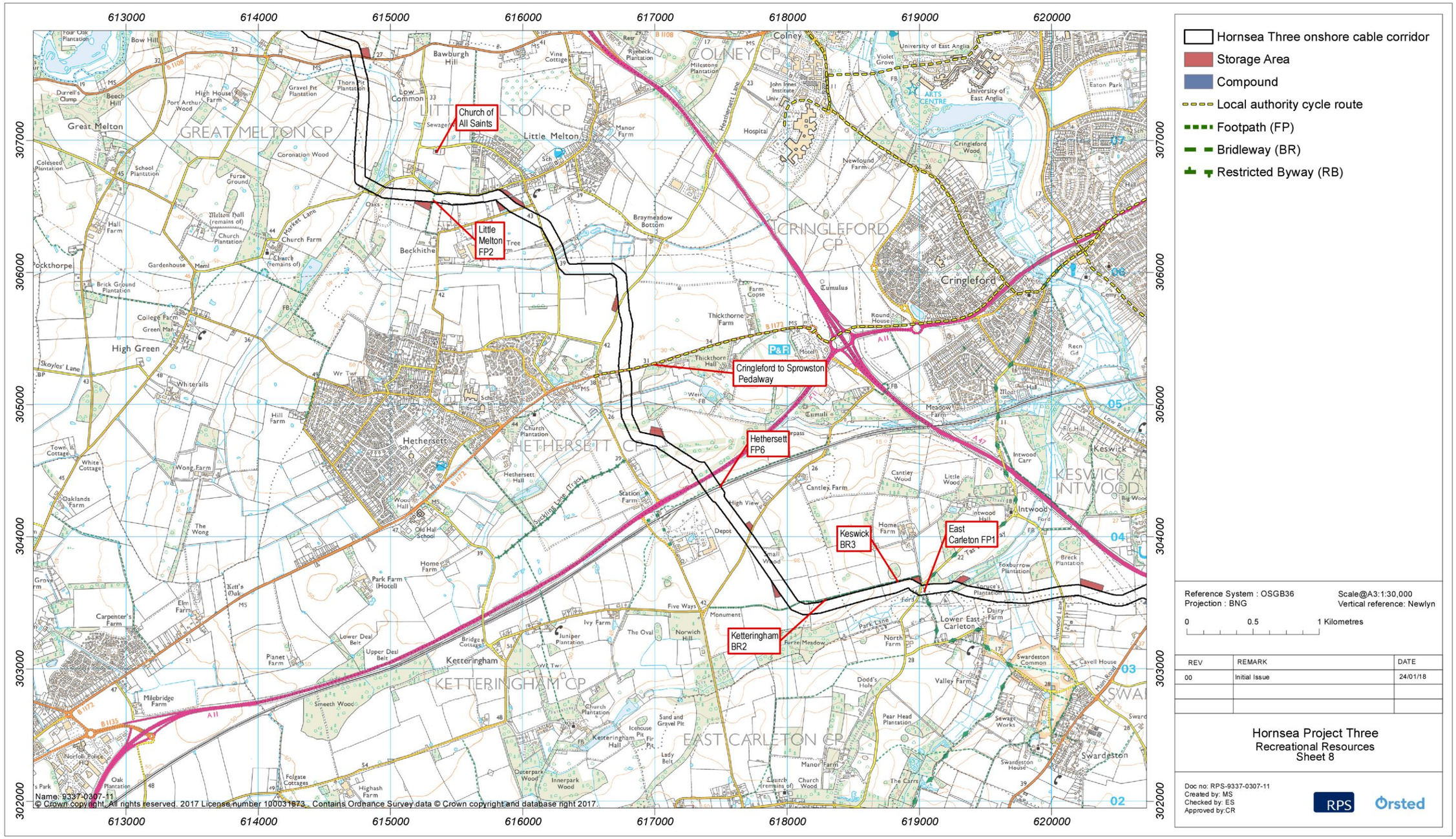

Figure 6.2: Recreational resources.

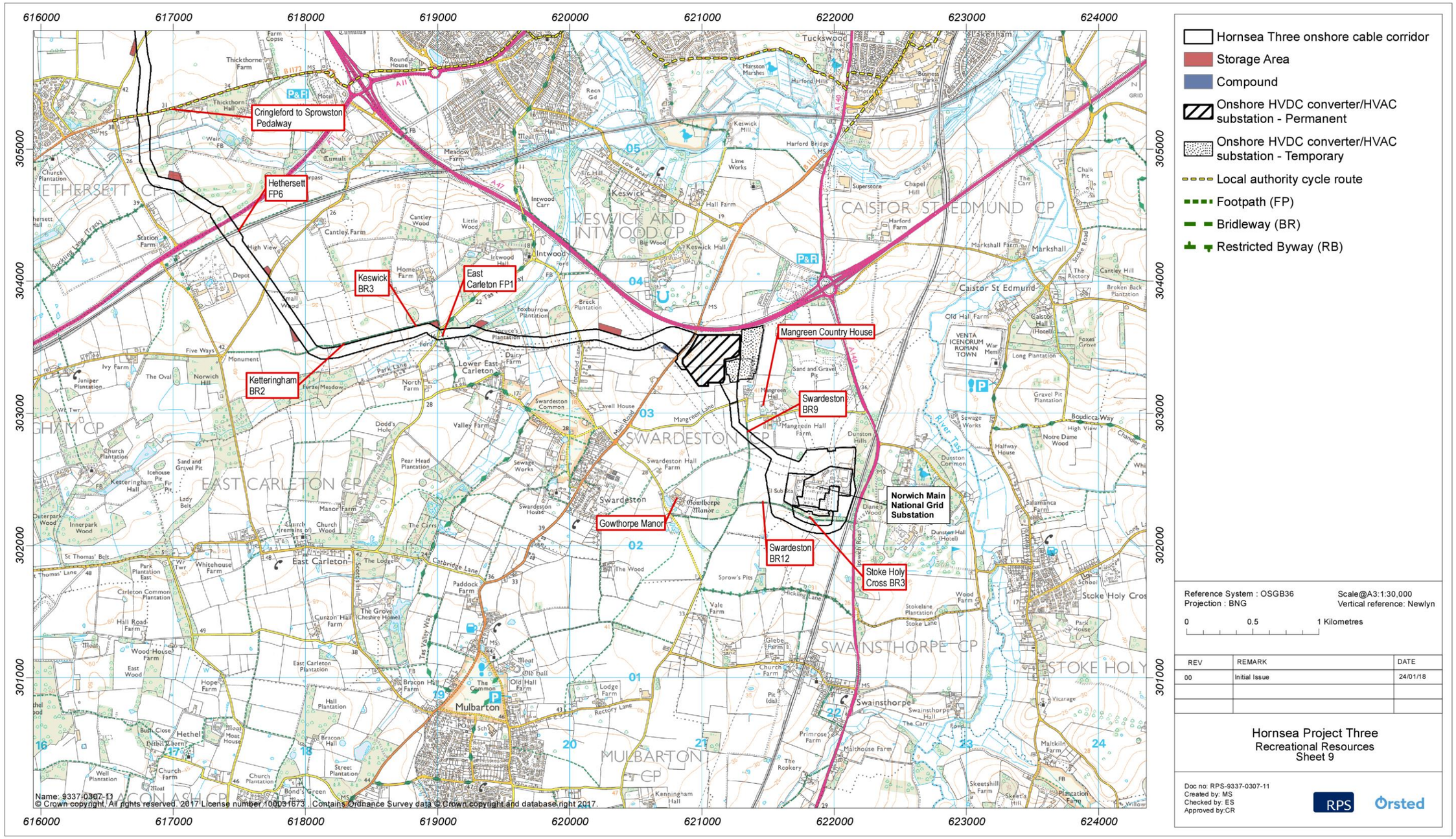

Figure 6.2: Recreational resources.

6.7.4 Farming Information

6.7.4.1 The distribution of agricultural land use within the Local Authority areas that form part of the Hornsea Three land use and recreation study area, as well as nationally (for reference purposes) is summarised in Table 6.21.

Table 6.21: Distribution of agricultural land use.

Local Authority area	Area of cereal cropping (ha)	Percentage of cereals (%)	Area of fruit and vegetable growing (ha)	Percentage of fruit and vegetable (%)	Grassland area (ha)	Percentage of grassland (%)
North Norfolk	32,719	68	1,673	4	12,776	28
Broadland	16,136	60	767	3	10,027	37
Norwich and South Norfolk	31,895	62	1,072	2	18,749	36
England	2,492,296	35	128,094	2	4,412,696	63

6.7.4.2 The statistical information identifies that the Local Authority areas, within which the Hornsea Three onshore elements are situated, are characterised as mainly cereal cropping (60 to 68%). This is a much higher percentage than for England as a whole (35% cereal cropping) which is dominated overall by grassland use (63%). This data aligns with the findings of site visits undertaken in Autumn and Winter 2017, which identified the Hornsea Three onshore cable corridor to be characterised mainly by large scale arable farming, with smaller areas of grassland use, often close to river corridors or around the edges of settlements.

6.7.4.3 The 2016 farming statistical datasets also provide an indication of average farm size at a county level (Norfolk) and national level as shown in Table 6.22.

Table 6.22: Distribution of farm sizes in Norfolk and England.

Size of farm (ha)	Number of farms in Norfolk	Percentage (%)	Number of farms in England	Percentage (%)
< 5	554	16	11,564	11
5 to 20	804	23	28,740	27
20 to 50	601	17	22,523	21
50 to 100	509	14	18,388	17
100+	1,071071	30	25,638	24

6.7.4.4 This data indicates that within Norfolk, there is a higher than average number of large farm units of >100 ha (30%), compared to the average for England (24%). This aligned with the findings of the site visit which indicated that the Hornsea Three land use and recreation study area is characterised by large arable holdings and country estates.

6.7.4.5 The distribution of farm holdings within the Hornsea Three land use and recreation study area is illustrated in volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures.

6.7.4.6 The agricultural land use within the identified farm holdings is predominantly arable, with smaller areas of livestock grazing, particularly associated with areas within or close to the river valleys.

6.7.4.7 Information from landowners indicates that the Hornsea Three land use and recreation study area is dominated by large arable farms comprising in excess of 100 ha, with a number of these holdings comprising more than 200 ha of land. Of the holdings potentially affected by Hornsea Three, approximately 50% of these comprise large arable holdings greater than 100 ha in size. A further 10% comprise medium sized holdings more than 50 ha in size, with the remaining land holdings, approximately 35% comprising smaller agricultural interests.

6.7.4.8 The Hornsea Three land use and recreation study area is therefore characterised by large arable holdings and managed estates. The information collated indicated that at least eight holdings operate commercial shoots.

6.7.4.9 Stewardship of the environment through recognised Defra schemes is widespread. These include the Entry Level Stewardship (ELS) and Higher Level Stewardship (HLS), which although schemes that were superseded in 2014 with the Countryside Scheme, although existing ELS and HLS agreements will continue to run alongside until the end of the agreement periods. Volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures shows the location of agreements for ELS and HLS together with the more recent Countryside Scheme agreements.

6.7.4.10 The soil survey work undertaken indicates that the main limiting factor on the agricultural productivity within much of the Land Use and Recreation study area is soil droughtiness. During site visits fixed and portable irrigation equipment was observed on several land holdings. Discussions with landowners have also identified that underdrainage is present on a number of holdings, although it is anticipated that these would be associated with the areas of heavier textured, poorly drained land within the study area, generally associated with areas characterised by boulder clay soils and low-lying areas close to river valleys.

6.7.5 Future baseline scenario

6.7.5.1 The Infrastructure Planning (EIA) Regulations 2017 requires that "*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*" is included within the Environmental Statement.

6.7.5.2 No significant changes to the baseline are anticipated in relation to land use, access land, existing recreational resources, PRoWs and other linear recreational routes. New recreational resources may be developed in the future but it is not possible to anticipate what the nature and location of these resources is likely to be. It is possible that land within the Hornsea Three land use and recreation study area may be allocated for future development but such additional future land requirements are not known at the time of preparing this application.

6.7.6 Data limitations

6.7.6.1 Representative soil sampling within the individual soil associations identified from the published information within the Hornsea Three land use and recreation study area, including the areas of permanent land take, was undertaken between September 2017 and January 2018 (see Table 6.6) and the results are reported in volume 6, annex 6.2: Soil Survey Results. At some locations identified for survey, permission to access the land was not permitted. However, the published data together with the representative survey work carried out within identified soil types is considered sufficient to provide a suitable baseline to inform the assessment.

6.7.6.2 No data limitations have been identified in the preparation of this Environmental Statement chapter with regard to recreation.

6.8 Key parameters for assessment

6.8.1 Maximum design scenario

6.8.1.1 The maximum design scenarios identified in Table 6.23 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the details provided in the project description (volume 1, chapter 3: Project Description). Effects of greater significance are not predicted to arise should any other development scenario, based on details within the project Design Envelope (e.g. alternative cable trench layout), to that assessed here be taken forward in the final design scheme.

6.8.2 Impacts scoped out of the assessment

6.8.2.1 On the basis of the baseline environment described in this chapter and the project description outlined in volume 1, chapter 3: Project Description, a number of impacts are proposed to be scoped out of the assessment for land use and recreation. These impacts are outlined, together with a justification for scoping them out, in Table 6.24.

Table 6.23: Maximum design scenario considered for the assessment of potential impacts on land use and recreation.

Potential impact	Maximum design scenario	Justification
Construction phase		
Impacts of construction that may affect ALC and farm holdings.	<u>Hornsea Three landfall area</u> Open cut at the Hornsea Three landfall area including: • Up to 42,000 m^2 compound area including up to 1,500 m^2 from transition joint bays (based on 250 m^2 x 6); • Up to six cables; and • Corridor width up to 240 m wide (comprising six cables (with installation area up to 15 m) plus up to 20 m separation between each cable). The maximum duration over which works could occur at the landfall would be 5.5 years (assuming a three year gap between the two phases). <u>Hornsea Three onshore cable corridor</u> • Up to 1,650,000 m^2 (5 m x 55,000 m x 6) from installation of up to six cable trenches; • On average 0.6 m stabilised backfill in each 2 m deep trench; • Up to 99,000 m^2 from jointing bays (based on 440 jointing bays (each jointing bay is 9 m x 25 m)); • Up to 3,960 m^2 from link boxes (based on 440 link boxes (each link box: is 3 m x 3 m)). Link boxes are permanent sub surface structures; • Up to 396,000 m^2 from installation of temporary haul road/accesses (6 m x 66,000 m per phase); • Up to 120 HDD locations per phase (up to 105 minor HDDs and 15 major HDDs per phase), up to 54,000 m^2 from major HDD compounds (based on 15 HDD compounds (each compound is 60 m x 60 m)); • Up to 5 secondary compounds; • Up to 55 storage areas; and • The haul road would be surfaced with aggregate on geotextile and would be removed at the end of each construction phase. The maximum duration over which construction could occur at the onshore cable corridor would be 5.5 years incorporating two phases (assuming a three-year gap between the two phases). The work in each phase is expected to progress along the Hornsea Three onshore cable corridor with a typical active construction works duration of three months at any particular location. <u>Onshore HVAC booster station</u> Up to 30,407 m^2 for permanent area of site plus a temporary works area up to 25,000 m^2. Maximum building footprint of 9,000 m^2 (based on single building scenario (120 m length and 75 m width) and height up to 12.5 m). Up to 30,000 m^3 excavated for basement (based on 5 m deep and area of 6,000 m^2). The maximum duration over which construction could occur at the onshore HVAC booster station would be five years incorporating two phases assuming a three-year gap with no active construction activity between the two phases. <u>Onshore HVDC converter/HVAC substation</u> Up to 149,302 m^2 for permanent area of site (including an area which may be used for landscaping) plus a temporary works area of 91,000 m^2. Maximum building dimensions: up to 220 m length, 75 m width and 25 m height for main buildings. The maximum duration over which construction could occur at the onshore HVDC converter/HVAC substation would be six years incorporating two phases assuming a three-year gap with between the two phases. <u>Construction programme</u> The maximum duration of onshore construction for all onshore elements of Hornsea Three would be eight years, which assumes construction across two phases with a three-year gap in-between, as a result of staggered construction of the components (onshore HVAC booster station, onshore HVDC converter/HVAC substation and Hornsea Three onshore cable corridor) and each phase would be preceded by pre-construction activities such as borehole investigations at HDD crossing points.	Open cut construction methods at the Hornsea Three landfall area and the onshore cable corridor represents the maximum design scenario for construction impacts on ALC as it leads to disruption of the largest area of agricultural land. The HVAC transmission option represents the maximum design scenario due to the greater number of cable trenches required and therefore, the greatest area of disturbance. The dimensions of the main buildings at the onshore HVDC converter/HVAC substation represent the maximum design scenario for ALC and farm holdings as it results in the largest possible area of land taken out of agricultural production. The total duration of onshore construction, of up to eight years, represents the maximum design scenario as it represents the longest period of disruption to ALC and to farm holdings. These parameters identify the likely maximum length of the construction period and the maximum area of land likely to be affected by the onshore HVAC booster station and onshore HVDC converter/HVAC substation.

Potential impact	Maximum design scenario	Justification
Impacts of construction may affect recreational use of the coast.	<u>Hornsea Three landfall area</u> Open cut at the Hornsea Three landfall area including: • Up to 42,000 m² compound area including up to 1,500 m² from transition joint bays (based on 250 m² x 6) and working area; • Up to six cables; and • Corridor width up to 240 m wide (comprising six cables (with installation area up to 15 m) plus up to 20 m separation between each cable). The maximum duration over which works could occur at the landfall would be 5.5 years (assuming a three year gap between the two phases). <u>Construction programme</u> The maximum duration of construction for all onshore elements of Hornsea Three would be eight years, which assumes construction across two phases with a three-year gap in-between, as a result of staggered construction of the components (onshore HVAC booster station, onshore HVDC converter/HVAC substation and Hornsea Three onshore cable corridor) and each phase would be preceded by pre-construction activities such as borehole investigations at HDD crossing points.	The maximum design scenario in terms of impacts on the recreational use of the coast is represented by open cut construction methods as this would lead to a larger area of disturbance. These parameters identify the likely maximum length of the construction period and the maximum area of land to be affected at the Hornsea Three landfall area. The HVAC transmission option represents the maximum design scenario due to the greater number of cable trenches required and therefore, the greatest area of disturbance.
Impacts of construction may affect access land. Impacts of construction may affect recreational resources. Impacts of construction may affect PRoWs. Impacts of construction may affect other linear routes.	<u>Hornsea Three landfall area</u> Open cut at the Hornsea Three landfall area including: • Up to 42,000 m² compound area including up 1,500 m² from transition joint bays (based on 250 m² x 6) and working area; • Up to six cables • Corridor width up to 240 m wide (comprising six cables (with installation area up to 15 m) plus up to 20 m separation between each cable). The maximum duration over which works could occur at the landfall would be 5.5 years (assuming a three year gap between the two phases). <u>Hornsea Three onshore cable corridor</u> Up to 1,650,000 m² (5 m x 55,000 m x 6) from installation of up to six cable trenches; • On average 0.6 m stabilised backfill in each 2 m deep trench; • Up to 99,000 m² from jointing bays (based on 440 jointing bays (each jointing bay is 9 m x 25 m)); • Up to 3,960 m² from link boxes (based on 440 link boxes (each link box: is 3 m x 3 m)). Link boxes are permanent sub surface structures; • Up to 396,000 m² from installation of temporary haul road/accesses (6 m x 66,000 m per phase); • Up to 120 HDD locations per phase (up to 105 minor HDDs and 15 major HDDs per phase), up to 54,000 m² from major HDD compounds (based on 15 HDD compounds (each compound is 60 m x 60 m)); • Up to five secondary compounds; • Up to 55 storage areas; and • The haul road would be surfaced with aggregate on geotextile and would be removed at the end of each construction phase. The maximum duration over which construction could occur would be 5.5 years incorporating two phases (assuming a three-year gap between the two phases). The work in each phase is expected to progress along the Hornsea Three onshore cable corridor with a typical active construction works duration of three months at any particular location. <u>Onshore HVAC booster station</u> Up to 30,407 m² for permanent area of site plus a temporary works area up to 25,000 m². Maximum building footprint of 9,000 m² (based on single building scenario (120 m length and 75 m width) and height up to 12.5 m). Up to 30,000 m³ excavated for basement (based on 5m deep and area of 6,000 m²). The maximum duration of construction for the onshore HVAC booster station is two years, this therefore means that the maximum duration over which construction could occur at the onshore HVAC booster station would be five years incorporating two phases (assuming a three-year gap with no active construction activity between the two phases). <u>Onshore HVDC converter/HVAC substation</u> Up to 149,302 m² for permanent area of site (including an area which may be used for landscaping) plus a temporary works area of	The maximum design scenario for impacts to recreational resources would be the HVAC transmission option due to the greater number of cable trenches required and the potential need to construct the onshore HVAC booster station as this would result in the largest area of disturbance. The dimensions of the main buildings at the onshore HVDC converter/HVAC substation represent the maximum design scenario for recreation as it results in the largest possible area of disturbance. The construction period up to eight years represents the maximum design scenario as it represents the longest period of disruption to recreational resources.

Potential impact	Maximum design scenario	Justification
	91,000 m². Maximum building dimensions: up to 220 m length, 75 m width and 25 m height for main buildings. The maximum duration of construction for the onshore HVDC converter/HVAC substation is three years, therefore the maximum duration over which construction could occur at the onshore HVDC converter/HVAC substation would be six years incorporating two phases (assuming a three-year gap with between the two phases). Construction programme The maximum duration of onshore construction for all onshore elements of Hornsea Three would be eight years, which assumes construction across two phases with a three-year gap in-between, as a result of staggered construction of the components (onshore HVAC booster station, onshore HVDC converter/HVAC substation and Hornsea Three onshore cable corridor) and each phase would be preceded by pre-construction activities such as borehole investigations at HDD crossing points.	
Operation and Maintenance phase		
Impacts of operation and maintenance may affect ALC and farm holdings.	Hornsea Three landfall area Link boxes would remain in place covered by manhole covers up to 4 m² in size. Hornsea Three onshore cable corridor Up to 3,960 m² from link boxes (based on 440 link boxes (each link box: is 3 m x 3 m)). Link boxes would remain in place covered by manhole covers up to 4 m² in size.	The HVAC transmission option is the maximum design scenario for impacts to ALC as it requires a greater number of link boxes and therefore represents the maximum areas that would be out of agricultural production during the operation and maintenance phase.
Decommissioning phase		
Impacts of decommissioning may affect ALC and farm holdings.	Hornsea Three landfall area and onshore cable corridor The onshore cables will remain in the ground. Surface features of the link boxes may be removed and made safe. Onshore HVAC booster station and onshore HVDC converter/HVAC substation Complete decommissioning and removal of the onshore HVAC booster station and onshore HVDC converter/HVAC substation. Both would be removed, and the site reinstated to its original function or for alternative use.	Although the removal of the export cable would present the most disturbance to agricultural land and farm holdings, the most realistic scenario would be that the cable ends are cut, sealed and remain in situ. The maximum design scenario in terms of impacts to ALC is the removal of the onshore HVAC booster station and onshore HVDC converter/HVAC substation and the likely reduction in the quality of the land following the reinstatement of soils in these areas as this represents a permanent loss of the "best and most versatile" agricultural land and the most disturbance to farm holdings.

Table 6.24: Impacts scoped out of the assessment for land use and recreation.

Potential impact	Justification
Operation and Maintenance phase	
Impacts on recreational resources.	Following the completion of the construction works, all recreational resources including PRoWs affected by the onshore works would be re-instated to their current condition and/or along their current alignments. Periodic maintenance operations would not impact on the ongoing use of linear recreational routes or other recreational facilities. Inspection pits along the Hornsea Three onshore cable corridor will be sited to avoid such resources and there are no recreational resources within the areas required for the onshore HVAC booster station and onshore HVDC converter/HVAC substation. Any effects on the amenity of recreational resources arising from the onshore HVAC booster station and onshore HVDC converter/HVAC substation are addressed in chapter 4: Landscape and Visual Resources and chapter 8: Noise and Vibration of this Environmental Statement.
Decommissioning phase	
Impacts on recreational resources.	It is anticipated that the export cable would not be removed during decommissioning, instead it would remain buried in situ. Therefore, there would be no change to recreational resources including PRoWs within the Hornsea Three land use and recreation study area during or as a result of the decommissioning phase. There are no recreational resources within the sites identified for the onshore HVAC booster station and onshore HVDC converter/HVAC substation. Any effects on the amenity of recreational resources arising from these onshore elements are addressed in chapter 4: Landscape and Visual Resources and chapter 8: Noise and Vibration of this Environmental Statement.

6.9 Impact assessment methodology

6.9.1 Overview

6.9.1.1 The land use and recreation EIA assessment has followed the methodology set out in volume 1, chapter 5: Environmental Impact Assessment Methodology. Specific to the land use and recreation EIA, the following guidance documents have also been considered:

- Design Manual for Roads and Bridges (DMRB) Section 11.3.6 'Land Use' (Highways Agency *et al.*, 2001);
- DMRB Section 11.3.8 'Pedestrians, Cyclists, Equestrians and Community Effects' (Highways Agency *et al.*, 1993);
- Planning Practice Guidance: Environmental Impact Assessment, Department for Communities and Local Government. Published March 2014 and updated July 2017; and
- Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2011).

6.9.1.2 In addition, the land use and recreation EIA has considered the legislative framework as defined by the Countryside and Rights of Way Act 2000 in relation to the public right of access to areas of Access Land as defined by Part 1 of the Act.

6.9.2 Impact assessment criteria

6.9.2.1 The criteria for determining the significance of effects is a two-stage process that involves defining the sensitivity of the receptors and the magnitude of the impacts. This section describes the criteria applied in this chapter to assign values to the sensitivity of receptors and the magnitude of potential impacts. The terms used to define sensitivity and magnitude are based on those used in the DMRB methodology, which is described in further detail in volume 1, chapter 5: Environmental Impact Assessment Methodology.

6.9.2.2 The criteria for defining sensitivity in this chapter are outlined in Table 6.25.

Table 6.25: Definition of terms relating to the sensitivity of land use and recreational receptors.

Sensitivity	Definition used for land use receptors	Definition used for recreational resources
Very High	Grade 1 agricultural land, specialised horticultural, intensive agricultural units.	Very high importance and rarity, international scale and very limited potential for substitution.
High	Grades 1 and 2 agricultural land, annual horticultural cropping and arable land.	High importance and rarity, national scale and limited potential for substitution.
Medium	Grades 2 and 3a land, arable land and horticultural cropping.	High or medium importance and rarity, regional scale, limited potential for substitution.
Low (or lower)	Grades 3b and lower quality land. Arable and grassland areas.	Low or medium importance and rarity, local scale.
Negligible	Grade 4 or 5 agricultural land.	Very low importance and rarity, local scale.

6.9.2.3 The criteria for defining magnitude in this chapter are outlined in Table 6.26.

Table 6.26: Definition of terms relating to the magnitude of an impact.

Magnitude of impact	Definition used for land use receptors	Definition used for recreational resources
Major	Loss of more than 50 ha of the "best and most versatile" agricultural land. Agricultural production affected at a regional level with full time farming enterprises rendered unworkable.	Loss of resource and/or quality and integrity of resource; severe damage of key characteristics, features or elements.
Moderate	Loss of more than 20 ha of the "best and most versatile" agricultural land. Agricultural production affected at a local level. Full-time farming enterprise/s rendered unworkable.	Loss of resource but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements.
Minor	Loss of 5 – 20 ha of the "best and most versatile" agricultural land. Affects the workability of individual farming enterprises, but farming can continue as before.	Some measurable change in attributes, quality or vulnerability, minor loss or alteration to one (maybe more) key characteristics, features or elements.
Negligible	Loss of less than 5 ha of the "best and most versatile" agricultural land. No adverse effects on farming enterprises or production.	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
No change	No effects on agricultural land.	No loss or alteration or characteristics, features or elements.

6.9.2.4 The significance of the effect upon land use and recreation is determined by correlating the magnitude of the impact and the sensitivity of the receptor, as presented in Table 6.27. Where a range of significance of effect is presented, the final assessment for each effect is based upon expert judgement. For the purposes of this assessment, any effects with a significance level of minor or less have been concluded to be not significant in terms of the EIA Regulations.

Table 6.27: Matrix used for the assessment of the significance of the effect.

		Magnitude of impact				
Sensitivity of receptor		***No change***	***Negligible***	***Minor***	***Moderate***	***Major***
	Negligible	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible	Negligible or minor	Minor	Moderate	Moderate or major
	High	Negligible	Minor	Minor or moderate	Moderate or major	Major or substantial
	Very high	Negligible	Minor	Moderate or major	Major or substantial	Substantial

6.10 Measures adopted as part of Hornsea Three

6.10.1.1 As part of the project design process, a number of designed-in measures have been proposed to reduce the potential for impacts on land use and recreation (see Table 6.28). As there is a commitment to implementing these measures, they are considered inherently part of the design of Hornsea Three and have therefore been considered in the assessment presented in section 6.11 (i.e. the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development.

6.10.1.2 These measures will be secured through an Outline CoCP (document reference A8.5) which will be developed in consultation with the relevant stakeholders, and secured through a requirement of the DCO.

Table 6.28: Designed-in measures adopted as part of Hornsea Three.

Measures adopted as part of Hornsea Three	Justification
Soils and agricultural land quality- Soil Management Strategy	
The identification and management of the soil materials on the site (the different soil types present, their likely physical characteristics and ALC have been identified by survey work undertaken).	To ensure that the individual soil types and soil profiles are stripped, stored and restored.
Separate stripping and storage of identified topsoil and subsoil resources.	To prevent mixing of soil materials which can reduce overall soil quality.
Location of topsoil and subsoil heaps so as to avoid cross-contamination of materials and the trafficking of soil heaps by construction traffic.	To prevent damage to and losses of soil materials.
Maintenance of topsoil and subsoil heaps in order to reduce potential losses of soil materials during the length of storage.	To prevent damage to and losses of soil materials.
Control of the timing of soil handling operations.	To reduce potential soil damage through handling in unsuitable conditions.
Choice of soil handling machinery and method for its use, in order to reduce potential for soil compaction and soil damage.	To reduce potential soil damage through the inappropriate use of machinery.
Implementation of appropriate soil aftercare following reinstatement.	To enable the land to be handed back to the landowner in a suitable condition.
Careful supervision of soil handling operations on site.	To ensure that recognised good practice is effectively implemented on site.
Implementation of a Soil Management Strategy.	To provide suitable detailed soil handling guidance that can be implemented effectively on site.
After construction has been completed on a length of Hornsea Three onshore cable corridor, the associated construction compounds and side accesses will be promptly dismantled and the land restored.	To limit, as far as possible, the length of time land is out of agricultural production.
Farming framework	
The maintenance and reinstatement, where reasonably practicable, of existing water supplies, irrigation facilities and drainage systems during the construction process.	To reduce potential disruption of soil drainage in areas beyond the construction corridor.
The maintenance of accesses across individual fields, where reasonably practicable, where these are severed during construction.	To allow the continued management of severed fields throughout the construction.
The maintenance of farm accesses, wherever reasonably practicable, between fields within a farm holding.	To enable the continued operation of farm holdings during the construction process.
Appropriate fencing of the onshore construction cable corridor during construction, dependent upon the nature of the individual farm holding affected.	To ensure that livestock are kept out of construction areas.
Appropriate construction practices to be implemented to ensure that the potential risk for the spread of animal and plant diseases is reduced as far as practicable.	To reduce, as far as possible, the risk for the spread of animal and plant diseases.
Timing of construction works, where feasible, to minimise disruption to landowners/farming practice, through agreement with landowners.	To reduce, as far as practicable, impacts on farming and ongoing activities on the land affected.

Measures adopted as part of Hornsea Three	Justification
Recreation	
Construction method statements will be prepared in consultation with the relevant asset owner or interested parties (e.g. tenant) in relation to the Hornsea Three onshore cable corridor crossings of receptors such as the Rivers Bure, Wensum and Yare and the North Norfolk Railway, which are also recreational resources.	To minimise the effects on these recreational resources during construction.
An outline Construction Traffic Management Plan accompanies this application (document reference A8.2) and will be developed further during detailed design stage in consultation with the relevant highway authority to document measures to manage construction traffic. This will include measures where there is an interface between non-motorised users and construction traffic such as separation of construction traffic and non-monitored users (NMUs), speed restrictions, and localised traffic control measures (e.g. traffic lights, deployment of banksmen).	To ensure the safe passage of NMUs during construction and maintain NMU routes, including those along local highways.
A PRoW Management Plan will be prepared in consultation with the relevant public rights of way officer at each local authority. This plan will be under the umbrella of, and secured through, the CoCP. This will include specific measures to be adopted to mitigate the temporary effects of the construction works including the following (see the Outline CoCP (document reference A8.5) which accompanies this application): • Measures dealing with the management of beach access; • Installation of fencing to ensure clear separation between areas accessed by the public and the construction works; • The maintenance of NMU access along PRoWs crossed by the Hornsea Three onshore cable corridor or the provision of a temporary diversion; • Provision of signage to inform and direct NMUs; • The widths of crossing points and temporary diversions will generally be between 2 m and 4 m wide; and • Following completion of construction activities all public access will be reinstated to a standard commensurate to that existing prior to the commencement of construction works. PRoW affected during the construction phase of the works would be crossed by either HDD or by open trench. When HDD is utilised, the PRoW would remain open during the duration of construction. Where open trenching is used to cross PRoW, the routes would either be temporarily stopped/diverted or traffic management measures would be put in place in some locations to maintain access. Where such measures cross a bridleway, all material used would be suitable for use by horses.	To minimise the effects on the PRoW network and maintain access for pedestrians and other NMUs along public highways and PRoW during construction and following the completion of construction works. To ensure the safety and separation of NMUs and construction traffic.
An outline communication plan has been developed as part of the Outline CoCP (document reference A8.5). This includes the use of appropriate media (signage/leaflets/notices) to inform residents, parish councils and visitors of temporary changes to the PRoW network arising from the onshore construction works for Hornsea Three. For example, warning notices will be erected at key points where PRoW are affected by the Hornsea Three onshore cable corridor works to make users aware of the construction working area and associated construction noise. The local newspaper will also carry such information.	To ensure local authorities and the public are kept informed of when and where works will be taking place to the PRoW network.
The Outline CoCP (document reference A8.5) includes measures to control and limit noise and vibration levels, so far as is reasonably practicable. Information of noise generating activities will be posted at relevant points where members of the public may pass the construction works (e.g. at a PRoW crossing point).	To minimise the temporary disturbance to sensitive receptors including recreational facilities and PRoW during the construction period.

6.10.1.3 In some cases, there may be additional mitigation measures required to minimise significant effects that are not "built in" to the project design ahead of the assessment. These are to be discussed in the sections on Further Mitigation and Future Monitoring where required.

6.11 Assessment of significance

6.11.1 Construction phase

6.11.1.1 The impacts of the onshore construction of Hornsea Three have been assessed on land use and recreation. The potential impacts arising from the construction of Hornsea Three are listed in Table 6.23, along with the maximum design scenario against which each construction phase impact has been assessed.

6.11.1.2 A description of the potential effect on land use and recreation receptors caused by each identified impact is given below.

Impacts of construction on Agricultural Land Classification and farm holdings

Magnitude of impact - Agricultural Land Classification

Permanent impacts on Agricultural Land Quality

6.11.1.3 There would be a permanent loss of agricultural land associated with the construction of the onshore HVAC booster station and associated with the onshore HVDC converter/HVAC substation. The detailed survey work has identified that the distribution of ALC Grades within these permanent land take areas is as set out in the following tables.

Table 6.29: Permanent loss of Agricultural Land Quality due to permanent land take.

Grade	Area (ha)	Percentage (%)
Onshore HVDC converter/HVAC substation		
2	2.53	14
3a	14.66	85
Non - Agricultural	0.13	1
TOTAL	**17.32**	**100**
Onshore HVAC booster station		
2	1.71	25
3a	4.36	63
3b	0.84	12
TOTAL	**6.91**	**100**

6.11.1.4 In terms of permanent loss of agricultural land, this may also occur at link box locations (which would be covered by manhole covers). Although Hornsea Three would seek to avoid high quality agricultural land, wherever possible, a precautionary approach has been adopted and it has been assumed for this assessment that all link boxes would be located in areas of potentially high quality agricultural land. The total area of these link boxes would require approximately 0.4 ha of land, and as such the assessment assumes that Hornsea Three could lead to an additional loss of approximately 0.4 ha of the "best and most versatile" agricultural land. On this precautionary basis, a total of approximately 23.66 ha of the "best and most versatile" agricultural land grades 2 and 3a would be affected by the HVDC converter/HVAC substation, the HVAC booster station and the link boxes. The survey work identified a very similar pattern of ALC Grades to that predicted from the published information.

Temporary impacts on Agricultural Land Quality

6.11.1.5 In addition to permanent loss, the survey work undertaken by RPS and previously by Defra on the range of different soil types identified by the Published Soils Information for the Hornsea Three landfall and onshore cable corridor (as well as the compounds, storage areas and accesses) has identified that proportions of Grades 2 and 3a agricultural land would be temporarily affected during construction. The areas and Grades identified within the temporary construction areas from the survey work are as follows (Table 6.30).

Table 6.30: Temporary construction areas – ALC detailed survey results.

ALC Grade	Area (ha)
2	26.18
3a	77.71
3b	46.82
4	2.54
TOTAL	**153.25**

6.11.1.6 It has therefore been identified that approximately 100.24 ha of the "best and most versatile" agricultural land would be temporarily affected by the temporary construction areas. The survey work identified a very similar pattern of ALC Grades to that predicted from the published information.

6.11.1.7 Based on the survey work undertaken the likely proportions of ALC Grades that would be temporarily affected within Hornsea Three can be predicted based on the distribution of the different soil types along the onshore cable corridor. This prediction of the likely distribution of ALC Grades does not include the areas of disturbed land found in Area 1 North where the soil profiles are not representative of the Newmarket 2 Association.

Table 6.31: Predicted percentages of ALC Grades across all temporary construction areas.

Likely percentages of ALC Grades based on ALC survey work (%)				
Soil Type	***Grade 2***	***Grade 3a***	***Grade 3b***	***Grade 4***
Newmarket 2 (343g)		82	18	
Newport 3 (551f)	20	80	-	-
Newport 4 (551g)	-	-	100	-
Wick 2 (541s)	53	39	8	-
Wick 3 (541t)	19	56	19	-
Burlingham 1 (572n)	-	63	37	-
Burlingham 3 (572p)	19	72	9	-
Isleham (861b) /Adventurers	-	-	-	100

6.11.1.8 Based on the proportions of ALC Grades identified by the survey work within the different soil types for all of the Hornsea Three temporary construction areas, the approximate areas and percentages of ALC Grades likely to be affected have been be extrapolated as set out in Table 6.32.

Table 6.32: Predicted areas of ALC Grades likely to be temporarily affected by Hornsea Three based on extrapolation from detailed ALC survey work.

Predicted areas of likely ALC Grades based on Extrapolation from detailed ALC Survey work (ha)				
Soil Type	***Grade 2***	***Grade 3a***	***Grade 3b***	***Grade 4***
Newmarket 2 (undisturbed areas only)	-	3.65	0.89	-
Newport 3 (551f)	8.5	34.0	-	-
Newport 4 (551g)	-	-	116.1	-
Wick 2 (541s)	21.2	15.6	3.2	-
Wick 3 (541t)	13.3	39.1	5.6	-
Burlingham 1 (572n)	-	76.9	45.2	-
Burlingham 3 (572p)	6.3	23.9	3.0	-
Isleham (861b) /Adventurers	-	-	-	25.7
TOTALS	**49.3**	**193.15**	**173.99**	**25.7**

Summary of magnitude of impact on Agricultural Land Classification during the construction period.

6.11.1.9 The detailed results of the site survey work, combined with extrapolation of these results throughout Hornsea Three identify that the areas of "best and most versatile" agricultural land likely to be affected during the construction period (permanent and temporary) would be in excess of 50 ha.

6.11.1.10 However, at the end of construction or alternatively at the end of each phase in the two phase option, soils would be reinstated across the temporary land take areas and the land reinstated to a standard capable of being returned to its former agricultural use, as far as possible. The stripping, storage and reinstatement of the soil materials would be undertaken in accordance with a Soil Management Strategy (see Outline CoCP, document reference A8.5), the principles of which are described in Table 6.28. The detailed soil survey work that has been undertaken as part of this assessment provides information on the likely characteristics, including likely topsoil and subsoil depths and soil textures of soil profiles within the different soil types along the route.

6.11.1.11 The survey work has identified the dominance of light sandy textured soils within the Hornsea Three area. These soils are generally less susceptible to damage during soil handling than heavy textured soils where compaction and structural damage are more of a concern. However, the survey work has also identified a degree of variability in soil profile characteristics and stone contents across short distances. Whilst the Soil Management Strategy (see Outline CoCP, document reference A8.5) and careful supervision of soil handling during the construction phase, would ensure that soil mixing is reduced as far as possible, there may be some areas where soil quality becomes reduced due to an increase in topsoil stone contents within restored profiles or an increased risk of droughtiness due to the incorporation of sandier materials within subsoil horizons where these are disturbed (predominantly within the cable trench excavations).

6.11.1.12 Whilst it is recognised that there is the potential for a reduction in the soil quality following reinstatement in some areas, as described in paragraph 6.11.1.11 above, it is assessed that the total permanent loss of the "best and most versatile" agricultural land (Grades 2 and 3a) is unlikely to exceed 50 ha on the completion of the construction phase, taking into account the implementation of an appropriate Soil Management Strategy (see Outline CoCP, document reference A8.5). On the completion of the restoration of the construction areas, the magnitude of the loss of "best and most versatile" agricultural land is therefore assessed as moderate.

<u>Magnitude of impact – farm holdings</u>

6.11.1.13 During the construction period there would be permanent losses of agricultural land from farm holdings associated with the construction of the onshore HVAC booster station and with the onshore HVDC converter/HVAC substation. This would affect the following farm holdings Table 6.33.

Table 6.33: HVAC booster station and HVDC converter/HVAC substation – effect on farm holdings.

Farm Holding	Approximate Permanent Land Take (ha)
Farm Holding 03 Great Farm, Saxthorpe	7.09
Farm Holding 41 The Mill House	16.18
Farm Holding 43 The Woodlands	1.05

6.11.1.14 Holding 03 Great Farm would be affected by the location of the onshore HVAC booster station. This holding comprises in excess of 200 ha of mainly arable land and it is assessed that the permanent loss of approximately 7.09 ha would not threaten the future operation of the farming enterprise.

6.11.1.15 Holdings 41 and 43 The Mill House and The Woodlands, both of which comprise in excess of 100 ha of mainly arable land, would be affected by the onshore HVDC converter/HVAC substation. Holding 43 The Woodlands would be subject to a small permanent loss of just over 1 ha of land, whilst there would be permanent loss of approximately 16.18 ha at Holding 41. It is assessed that the loss of these discrete areas of land from these large arable holdings would not threaten the future operation of these farming enterprises.

6.11.1.16 In addition, there may be small areas of agricultural land that may be permanently lost for the provision of manhole covers over the link boxes. Whilst Hornsea Three would seek to locate these in non-agricultural locations wherever possible, assuming a precautionary worst-case, these could impact up to 0.4 ha of land spread across farm holdings within the Hornsea Three land use and recreation study area.

6.11.1.17 During the construction phase or phases there would also be temporary disruption to farm holdings along the route of the Hornsea Three onshore cable corridor as illustrated volume 6, annex 6.3: Agricultural Land Classification and Farm Holdings Figures. The approximate temporary land take from the different farm holdings identified is summarised in Table 6.34.

Table 6.34: Areas of temporary land take from farm holdings.

Farm Holding	Approximate Temporary Land Take (ha)	Holding Size Range (ha)
01	14.14	>100
02	33.59	>500
03	15.89	>200
04	2.98	50-100
05	3.85	<50
06	2.21	<50
07	20.82	>200
08	4.24	50-100
09	12.29	>100
10	9.18	>200
11	16.59	>200
12	2.62	>100
13	0.49	<10
14	16.84	100-200
15	17.06	>200
16	3.53	>200
17	27.40	>200
18	15.05	>100
19	9.62	>100
20	23.69	>200
21	2.60	<50
22	12.56	>100
23	23.72	>200
24	17.04	>200
25	15.51	>500
26	3.64	>100
27	13.81	>200
28	28.12	>200
29	2.31	<50
30	5.17	100-200
31	3.33	<50
32	1.95	<50
33	0.64	<50
34	4.03	<50
35	6.65	50-100
36	4.52	>100
37	6.67	100-200
38	9.97	>200
39	11.88	100-200
40	1.19	50-100
41	8.33	100-200
42	3.78	<50
43	16.61	100-200
44	4.18	>200

6.11.1.18 As Table 6.34 above identifies, during the construction phase of Hornsea Three onshore cable corridor there would be disruption to approximately 44 operational farm holdings where there may be disruption to farming management, including changes to farm access within individual fields and along local roads, as well as temporary effects on irrigation and field drainage systems. Approximately 66% of these holdings comprise more than 100 ha of land and are predominantly arable based farms. It has also been identified that at least eight holdings hold shoots regularly, which could potentially be subject to disruption, although this would be avoided wherever possible during the construction phase through landowner consultation.

6.11.1.19 In summary, the construction period of Hornsea Three has the potential to affect the workability of individual farms whilst areas of land are taken temporarily out of use, which could potentially affect agricultural productivity at a local level. The magnitude of impact on farm holdings during the construction phase is therefore assessed as moderate.

6.11.1.20 The agricultural land temporarily affected by the construction of Hornsea Three would be reinstated to its former use through the implementation of measures outlined in Table 6.28. Therefore, the only permanent losses of land from farm holdings would be associated with the onshore HVAC booster station and the onshore HVDC converter/HVAC substation which would affect approximately 24.32 ha, together with small areas of land potentially required for link boxes which could affect a further maximum of approximately 0.4 ha. The effects of the permanent land take affect predominantly three large arable farm holdings where the loss of the land would not threaten the future operation of the holdings. Given that the areas of temporary land take will be restored to its former agricultural use, the magnitude of the impact on farm holdings would be minor.

Sensitivity of receptor – Agricultural Land Classification

6.11.1.21 The sensitivity of the receptor is assessed to be medium based on the presence of the areas of the "best and most versatile" agricultural land Grades 2 and 3a, as identified by the ALC survey work.

Sensitivity of receptor – farm holdings

6.11.1.22 The sensitivity of the receptor is assessed to be medium based on the presence of mainly medium to large arable based farming enterprises.

Significance of the effect – Agricultural Land Classification

6.11.1.23 Following the implementation of the Soil Management Strategy (see Outline CoCP, document reference A8.5) as outlined in Table 6.28 and the restoration of the agricultural land that is temporarily affected, it is assessed that the magnitude of impact of these permanent losses is moderate with a medium sensitivity and therefore the effect at the end of the construction phase or phases on ALC is assessed to be of **moderate adverse** significance, which is significant in EIA terms.

Significance of the effect – farm holdings

6.11.1.24 Following the implementation of the Soil Management Strategy (see Outline CoCP, document reference A8.5) as outlined in Table 6.28 and the restoration of the agricultural land that is temporarily affected, it is assessed that the magnitude of impact of the permanent losses is minor on farm holdings which are of medium sensitivity. Therefore, the effect at the end of the construction phase on farm holdings is assessed to be of **minor adverse** significance, which is not significant in EIA terms.

Impacts of construction may affect recreational use of the coast

Magnitude of impact

6.11.1.25 The shingle beach at Weybourne is extensive and whilst public access may be partially restricted during Hornsea Three landfall area construction activities, there remains large areas to the east and west that would remain accessible for fishing and other beach based activities during the construction phase. There would be no disruption to the use of the beach side car park. The magnitude of impact is therefore assessed to be minor.

Sensitivity of receptor

6.11.1.26 The beach at Weybourne is primarily a local resource, with extensive areas of shingle to the east and west and therefore the sensitivity is low.

Significance of the effect

6.11.1.27 Overall, the sensitivity of the receptor is considered to be low and the magnitude of the impact is deemed to be minor. The effect will, therefore, be of temporary **negligible** significance, which is not significant in EIA terms.

Impacts of construction may affect access land

Magnitude of impact

6.11.1.28 The Hornsea Three onshore cable corridor has been developed to avoid access land on Muckleburgh Hill, Kelling Heath and Alderford Common but would cross the southern part of an area of dedicated access land at Bodham. At this location the crossing method for the access land would be HDD, so the public would continue to have access to all of Bodham Wood. Therefore, there would be no direct impacts on the use of access land during the construction phase.

6.11.1.29 Any effects on the amenity of access land during the construction phase arising from changes to the visual and acoustic environment would be spatially limited and are addressed in chapter 4: Landscape and Visual Resources and chapter 8: Noise and Vibration respectively.

Impacts of construction may affect recreational resources

Magnitude of impact

6.11.1.30 The Hornsea Three onshore cable corridor crosses the River Bure at Corpusty, the River Wensum at Attlebridge, the River Tud at Easton and the River Yare at Marlingford. The Wensum and Yare are popular for fishing and water-based activities such as canoeing and kayaking. The onshore cable would be installed under these rivers by means of a trenchless technology and therefore there would be no direct effects on their use for recreational purposes. Any effects on their amenity during the construction phase arising from changes to the visual and acoustic environment would be spatially limited and are addressed in chapter 4: Landscape and Visual Resources and chapter 8: Noise and Vibration respectively.

6.11.1.31 The Hornsea Three onshore cable would be installed by means of a trenchless technology under the North Norfolk Railway west of Kelling Halt and therefore there would be no direct effects on its use for recreational/tourist purposes.

6.11.1.32 Baconsthorpe Castle, a Scheduled Monument which lies to the east of the Hornsea Three onshore cable corridor, would remain open to visitors during the construction phase of Hornsea Three. Any effects on the setting of this site during construction are addressed in chapter 5: Historic Environment and any temporary effects on its amenity arising from changes to the visual environment are addressed in chapter 4: Landscape and Visual Resources.

6.11.1.33 Those visitor resources that lie outside but proximate to the Hornsea Three onshore cable corridor construction activities (i.e. Kelling Heath Holiday Park; Salle Park; The Church of St Peter and St Paul at Salle; Booton Common nature reserve; The Church of St Michael and all Angels at Booton; The Church of St Faith at Little Witchingham; The Church of St John the Baptist at Alderford; and The Church of All Saints at Mill Road, Little Melton; Mangreen Country House; and Gowthorpe Manor) would remain available to visitors during the construction phase of the project. Any effects on the amenity of these visitor resources arising from changes to the visual and acoustic environment are addressed in chapter 4: Landscape and Visual Resources and chapter 8: Noise and Vibration respectively.

6.11.1.34 Construction traffic would use existing roads and tracks alongside the following recreational/visitor resources but this would be managed to minimise any disruption to these facilities through implementation of measures set out in the Construction Traffic Management Plan (document reference A8.2). These tracks are:

- The Muckleburgh Military Collection sited on the former Royal Artillery Anti-Aircraft training camp at Weybourne; and
- Foxhills Camping site in Weybourne accessed off the A149.

6.11.1.35 Taking into consideration these factors and measures set out in Table 6.28, the magnitude of impact on recreational resources is therefore assessed to be minor.

Sensitivity of receptor

6.11.1.36 These local resources are also visitor attractions and therefore the sensitivity is medium.

Significance of the effect

6.11.1.37 Overall, the sensitivity of the receptor is considered to be medium and the magnitude of the impact is deemed to be minor. The effect will, therefore, be of temporary **minor adverse** significance, which is not significant in EIA terms.

Impacts of construction may affect PRoWs

Magnitude of impact

6.11.1.38 The impact on PRoWs which may be impacted during the construction phase of Hornsea Three, as well associated construction management measures designed to minimise impacts, are is set out in Table 6.35.

6.11.1.39 For the purposes of this assessment the 'maximum design scenario' for the crossing of these PRoW is described. In some cases, where the 'maximum design scenario' is open-cut trenching, there may be the possibility of installing the export cables using HDD technology, with or without a haul road over. This is the case, for example, for the Peddars Way and Norfolk Coast Path National Trail at the landfall. In these circumstances, the route would remain open during the construction works, with temporary measures put in place where a haul road is located over the HDD to manage the interface of non-motorised users and construction traffic.

6.11.1.40 Given that all works at the main construction compound would occur on existing hard-standing, there is no land use and recreation study area relevant to this element of Hornsea Three.

Table 6.35: PRoWs impacted during the construction of Hornsea Three.

Chainage	Location	PRoW reference	Construction Method	Construction Management Measure
51.5	Weybourne	FP7 (Peddars Way & Norfolk Coast Path)	HDD or open cut trench	If HDD, the route remains open. If open cut trench, the route would be temporarily diverted for a maximum of 1 month on up to six occasions. A diversion route has been identified along existing tracks to the immediate south. This dedicated route, and access to it from the beach on either side, would be fenced and gated and managed in accordance with beach access measures as part of the PRoW Management Plan, as set out in the Outline CoCP (document reference A8.5).
50.0	Kelling	RB4	Interface with construction traffic accessing Hornsea Three onshore cable corridor/compounds.	A small diversion of RB4 at the junction of Weybourne Road may be required. Measures set out in Outline CoCP (document reference A8.5), PRoW Management Plan (see Outline CoCP) and Construction Traffic Management Plan (document reference A8.2), including separation of pedestrians and construction traffic and provision of signage, would be put in place.
47.4	Kelling	FP6	Open cut trench or HDD	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place. Route remains open.
47.1	Kelling	FP9	Open cut trench or HDD	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place. Route remains open.
43.3	Baconsthorpe	FP15	Open cut trench	The locally promoted route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
42.8	Hempstead	BR15 (Holt-Mannington Walk)	Open cut trench or HDD	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place. Route remains open.
42.3	Hempstead	FP10 (Holt-Mannington Walk)	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
39.5	Plumstead	BR6	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. It may also require the temporary diversion of connecting Little Barningham BR1 to ensure connectivity is maintained. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
37.5 – 38.3	Corpusty	RB21	Interface with construction traffic accessing permanent onshore HVAC booster station site.	Measures set out in Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), including separation of NMUs and construction traffic, and provision of signage, would be put in place. These are likely to remain in place for the whole of the construction period of the onshore HVAC booster station (approximately 12 months) on up to two occasions.
37.2	Corpusty	FP19	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place. Route remains open.

Chainage	Location	PRoW reference	Construction Method	Construction Management Measure
37.0	Corpusty	FP20	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
36.0	Corpusty	FP2	HDD	Route remains open.
33.5	Wood Dalling	FP3	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
30.0	Salle	BR4	HDD	Route remains open.
29.3	Salle	BR4	N/A	Measures set out in Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), including separation of pedestrians and construction traffic and provision of signage, would be put in place at the junction of Salle BR4 and Reepham Road as required.
29.4	Salle	FP8	HDD	Route remains open.
28.7	Reepham	FP18	Open cut trench or HDD. This crossing will be subject to a management plan regarding the interface of Hornsea Three and the Norfolk Vanguard offshore wind farm project (see cumulative effects section below).	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Route remains open. Management measures would be put in place, as required, at the interface of FP18 and the B1145 and construction storage area.
27.4	Booton	FP1	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
26.4	Booton	FP2	HDD or open cut	The route would be temporarily diverted within the order limits but the cable would be installed under this diversion by HDD. There may be a requirement for temporary management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), at the junction of FP2 and the highway.
24.3	Little Witchingham	FP6	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
23.9	Little Witchingham	FP2	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.
7.7	Little Melton	FP2 (also permissive bridleway)	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place. Route remains open.
4.0	Hethersett	FP6	HDD	Route remains open.
2.9	Ketteringham	BR2	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures, as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), would be put in place.

Chainage	Location	PRoW reference	Construction Method	Construction Management Measure
2.9 - 2	Ketteringham Keswick	BR2 BR3	N/A	BR2 and BR3 runs to the immediate north of the Hornsea Three onshore cable corridor. The route will remain open but due to its location to the immediate north of the Hornsea Three onshore cable corridor, temporary management measures such as fencing, visual screening and signage will be put in place as required.
1.9	East Carleton	FP1	Open cut trench	The route would be temporarily diverted within the order limits to either the north or south as work proceeds for a maximum of 3 months on up to two occasions. Management measures as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP) would be put in place.
400Kv	Swardeston	BR9	HDD with haul road over	Route remains open with management measures as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), as required.
400Kv	Swardeston	BR12	HDD with haul road over	Route remains open with management measures as set out in the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP), as required.
400kV	Stoke Holy Cross	BR3	HDD	Route remains open.

6.11.1.41 At the coast, the Hornsea Three landfall area construction works will result in the temporary disruption to a section of the Peddars Way and Norfolk Coast Path National Trail running west from its junction with the England Coast Path in Weybourne. The method of cable installation has not yet been confirmed but open cutting a trench through the route has been assessed (the maximum design scenario). Under this scenario a temporary diversion would be put in place along existing tracks to the immediate south for an indicative period of one month on up to six occasions. This dedicated route would be robustly fenced and gated in accordance with the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP) which will include specific beach access management measures to be developed in consultation with, and agreed with Norfolk County Council. This Plan would include management measures to be put in place on the beach at either side of the construction working areas to guide walkers along the diverted coastal path, and would also set out the measures to be followed for the reinstatement of the coastal path following the completion of construction works. Information on these temporary changes to the route of the coastal path would be posted in the beach side car park to the north of Weybourne, together with general information of the construction activities including those relating to offshore construction vessels. The magnitude of impact on this national resource is therefore assessed to be moderate (i.e. the route will remain open but the temporary diversion will be further away from the coast and approximately 600 m in length). Walkers using this temporary diversion will therefore be exposed to the construction activities but for a relatively short period of time.

6.11.1.42 In addition to the Peddars Way and Norfolk Coast Path National Trail, the Hornsea Three onshore cable corridor construction works will have a temporary impact on the PRoW identified in Table 6.35 above. A minimum of these 50% of the PRoW crossings within the onshore cable corridor would be via HDD where the route would remain open during the construction period along its existing alignment. Although some of the remaining PRoW may also be crossed by HDD (with or without a haul route over), the maximum design scenario of crossing by open cutting a trench through the route has been assumed for the purposes of this assessment. In this case, the PRoW would be subject to temporary diversions within the order limits to maintain public access and the connectivity of the network. These diversions would remain in place for an indicative one month period during the construction of each cable, with measures put in place in accordance with the Outline CoCP (document reference A8.5) and PRoW Management Plan (see Outline CoCP). The magnitude of impact on these local PRoWs is therefore assessed to be minor.

Sensitivity of receptor

6.11.1.43 The Peddars Way and Norfolk Coast Path National Trail is a national designation and therefore the sensitivity is high. The other PRoWs affected by the installation of the Hornsea Three onshore cable corridor comprise local routes and therefore the sensitivity is low.

Significance of the effect

6.11.1.44 The magnitude of the temporary effect on the Peddars Way and Norfolk Coast Path National Trail (which has a high sensitivity), taking into consideration the provision and length of a dedicated temporary diversion is assessed to be moderate. The significance of effect on this resource will therefore be of temporary **moderate adverse** significance, which is significant in EIA terms. The temporary effect on the other local PRoW crossed by the Hornsea Three onshore cable corridor is assessed to be of **minor adverse** significance, which is not significant in EIA terms.

Impacts of construction may affect other linear routes

6.11.1.45 The impact on other linear routes used for recreational purposes during the construction phase of Hornsea Three is set out in Table 6.36.

Table 6.36: Other linear routes affected during construction.

Chainage	Location	Name	Construction Method	Construction Management Measure
48.4	Holgate Hill, Weybourne	Holt Explorer Loop and Norfolk Coast Explorer Loop cycle routes	HDD	Routes remain open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).

Chainage	Location	Name	Construction Method	Construction Management Measure
44.7	Church Road, Bodham	Sustrans Regional Cycle Route 30 and Holt Explorer Loop and Norfolk Coast Explorer Loop cycle routes	HDD	Routes remain open.
42.8	Hempstead Road, Hempstead	Holt Explorer Loop and Norfolk Coast Explorer Loop cycle routes	HDD	Routes remain open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
34.1	Blackwater Lane, Heydon	Bickling to Cawston cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
31.2	Reepham Road, Salle	Bickling to Cawston cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
28.3	Disused railway line, Reepham	Marriott's Way and local cycle route	HDD	Routes remain open.
26.5	Church Road, Booton	Around Swannington cycle route	HDD	Route remains open.
22.6	Hall Road, Alderford	Around Swannington cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
21.2	Disused railway line, Attlebridge	Sustrans National Cycle Route 1 and Marriott's Way	HDD	Routes remain open.
20.5	The Street, Attlebridge	Around Ringland cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
19.2	Ringland Lane, Weston Longville	Around Ringland cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
17.1	Blackbreck Lane, Ringland	Recreational route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
16.2	Honington Lane, Ringland	Around Ringland cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
15.8	Sandy Lane, Ringland	Recreational route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
15.2	Weston Road, Ringland	Around Ringland cycle route	HDD	Route remains open with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
13.0	Broom Lane, Easton	Recreational route	HDD	Route remains open.
11.2	Bawburgh Road, Marlingford	Permissive bridleway	HDD	Route remains open if access arrangements still in place, with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
8.1	Market Lane, Little Melton	Permissive bridleway	HDD	Route remains open if access arrangements still in place.
7.7	Track off Market Lane, Little Melton	Permissive bridleway	Open cut	Localised diversion within the Order limits would be put in place, together with traffic management in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).

Chainage	Location	Name	Construction Method	Construction Management Measure
7.6	FP2 south of Great Melton Road, Little Melton	Permissive bridleway	HDD	Route remains open if access arrangements still in place, with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).
5.2	Norwich Road, Hethersett	Cringleford to Sprowston Pedalway	HDD	Route remains open.
2	Intwood Lane between East Carleton and Intwood	Tas Valley Way	HDD	Route remains open if access arrangements still in place, with traffic management where there is an interface with construction traffic in accordance with the measures set out in the Construction Traffic Management Plan (document reference A8.2).

Magnitude of impact

6.11.1.46 All of the linear routes identified for recreational use or promoted for use by non-motorised users will remain open during the construction period because the Hornsea Three onshore cable corridor will be installed by HDD under these facilities. The use of HDD will also mean that all of the local roads crossed by the onshore cable corridor, which are available for non-motorised users as well as motorised vehicles, will remain open during the construction period. Where there will be an interface between users of these routes and construction traffic, management measures will be put in place in accordance with the Construction Traffic Management Plan (document reference A8.2) and the Outline CoCP (document reference A8.5). The magnitude of impact on the users of these routes is therefore assessed to be minor adverse.

Sensitivity of receptor

6.11.1.47 The National Cycle Network Route is a national designation and therefore the sensitivity is high. The remaining resources are local in scale and therefore the sensitivity is low.

Significance of the effect

6.11.1.48 Taking into account the construction method and the management measures that would be put in place during the construction period, the magnitude of the temporary effect on the National Cycle Network Route (which has a high sensitivity) and the other local linear promoted routes crossed by the Hornsea Three onshore cable route is assessed to be minor. The significance of effect on this resource will therefore be of temporary **minor adverse** significance, which is not significant in EIA terms.

Future monitoring

6.11.1.49 No land use and recreation monitoring to test the predictions made within the construction phase impact assessment is considered necessary.

6.11.2 Operation and maintenance phase

6.11.2.1 The impacts of the onshore operation and maintenance of Hornsea Three have been assessed in relation to land use receptors as set out in Table 6.23 along with the maximum adverse scenario, against which each operation and maintenance phase impact has been assessed. The assessment of potential impacts on recreational receptors during the operation and maintenance phase has been scoped out for the reasons set out in Table 6.24.

6.11.2.2 A description of the potential effect on land use receptors caused by each identified impact is given below.

Impacts of operation and maintenance may affect Agricultural Land Classification and farm holdings

Magnitude of impact – Agricultural Land Classification

6.11.2.3 The magnitude of impact associated with the permanent loss of "best and most versatile" agricultural land during operation and maintenance is a continuation of the impact identified during the construction phase (see paragraphs 6.11.1.3 to 6.11.1.12). There would be no additional impacts on ALC and soils during the operation and maintenance period.

Magnitude of impact – farm holdings

6.11.2.4 The magnitude of impact associated with the permanent loss of "best and most versatile" agricultural land and farm holdings during operation and maintenance is a continuation of the impact identified during the construction phase (see paragraphs 6.11.1.13 to 6.11.1.20). There would be no additional effects on farm holdings during the operation and maintenance period.

Sensitivity of receptor- Agricultural Land Classification

6.11.2.5 The sensitivity of the receptor is assessed to be medium based on the presence of the "best and most versatile" agricultural land.

Sensitivity of receptor – farm holdings

6.11.2.6 The sensitivity of the receptor is assessed to be medium based on the presence of mainly arable based farming enterprises.

Significance of the effect – Agricultural Land Classification

6.11.2.7 The temporary and permanent effects of the Hornsea Three are assessed as part of the construction assessment (see paragraph 6.11.1.23). There would be no additional effects on ALC and soils during the operation and maintenance period.

Significance of the effect – Farm Holdings

6.11.2.8 The temporary and permanent effects of the Hornsea Three are assessed as part of the construction assessment (see paragraph 6.11.1.24). There would be no additional effects on farm holdings during the operation and maintenance period.

Future monitoring

6.11.2.9 No land use and recreation monitoring to test the predictions made within the operation and maintenance phase impact assessment is considered necessary.

6.11.3 Decommissioning phase

6.11.3.1 The environmental effects arising from the decommissioning of Hornsea Three are listed in Table 6.23 along with the maximum design scenario against which each decommissioning phase impact has been assessed. The assessment of potential impacts on land use and recreational receptors during the decommissioning phase has been scoped out for the reasons set out in Table 6.24.

Impacts of decommissioning may affect Agricultural Land Classification and farm holdings

6.11.3.2 For the purposes of this assessment, the Hornsea Three onshore export cable corridor would be left in place in the ground after decommissioning. It is also assumed that the onshore HVAC booster station and onshore HVDC converter/HVAC substation areas would be restored to its original use or alternative use. These activities would not result in any impacts on recreational resources within the Hornsea Three land use and recreation study area, although traffic management measures may be required should access to the site for these purposes need to cross a linear recreational route. Hornsea Three will develop those management measures in consultation with Norfolk County Council.

Future monitoring

6.11.3.3 No land use and recreation monitoring to test the predictions made within the decommissioning phase impact assessment is considered necessary.

6.12 Cumulative Effect Assessment methodology

6.12.1 Screening of other projects and plans into the Cumulative Effect Assessment

6.12.1.1 The Cumulative Effect Assessment (CEA) takes into account the impact associated with Hornsea Three together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise undertaken as part of the 'CEA long list' of projects (see volume 4, annex 5.2: Cumulative Effects Screening Matrix and annex 5.3: Location of Cumulative Schemes). Each project on the CEA long list has been considered on a case by case basis for scoping in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

6.12.1.2 In undertaking the CEA for Hornsea Three, it is important to bear in mind that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside Hornsea Three. For example, relevant projects and plans that are already under construction are likely to contribute to cumulative impact with Hornsea Three (providing effect or spatial pathways exist), whereas projects and plans not yet approved or not yet submitted are less certain to contribute to such an impact, as some may not achieve approval or may not ultimately be built due to other factors. For this reason, all relevant projects and plans considered cumulatively alongside Hornsea Three have been allocated into 'Tiers', reflecting their current stage within the planning and development process. This allows the CEA to present several future development scenarios, each with a differing potential for being ultimately built out. Appropriate weight may therefore be given to each Tier in the decision making process when considering the potential cumulative impact associated with Hornsea Three (e.g. it may be considered that greater weight can be placed on the Tier 1 assessment relative to Tier 2). An explanation of each tier is included below:

- Tier 1: Hornsea Three considered alongside:
  - Those with consent, and, where applicable (i.e. for low carbon electricity generation projects), that have been awarded a Contract for Difference but have not been implemented; and/or
  - Those currently operational that were not operational when baseline data was collected, and/or those that are operational but have an on-going impact.
- Tier 2: All projects/plans considered in Tier 1, as well as:
  - Those project/plans that have consent but, where relevant (i.e. for low carbon electricity generation projects) have no Contract for Difference; and/or
  - Submitted but not yet determined.
- Tier 3: All projects/plans considered in Tier 2, as well as those on relevant plans and programmes likely to come forward but have not yet submitted an application for consent (the PINS programme of projects and the adopted development plan including supplementary planning documents are the most relevant sources of information along with information from the relevant planning authorities regarding planned major works being consulted upon, but not yet the subject of a consent application). Specifically, this Tier includes all projects where the developer has advised PINS in writing that they intend to submit an application in the future, those projects where a Scoping Report is available and/or those projects which have published a PEIR.

6.12.1.3 It is noted that offshore wind farms seek consent for a maximum design scenario and the as built offshore wind farm will be selected from the range of consented scenarios. In addition, the maximum design scenario quoted in the application (and the associated Environmental Statement) are often refined during the determination period of the application. For example, it is noted that the Applicant for Hornsea Project One considered a maximum of 332 turbines within the Environmental Statement, but has gained consent for 240 turbines. Similarly, Hornsea Project Two has gained consent for an overall maximum number of turbines of 300, as opposed to 360 considered in the Environmental Statement and the 'as built' number of turbines is likely to be less than this. A similar pattern of reduction in the project envelope from that assessed in the Environmental Statement, to the consented envelope and the 'as built' project is also seen across other offshore wind farms of relevance to this CEA. This process of refinement can result in a reduction to associated project parameters, for example, the number of cable trenches or the height of onshore substations. The CEA presented in this land use and recreation chapter has been undertaken on the basis of information presented in the Environmental Statements for the other projects, plans and activities. Given that this broadly represents a maximum design scenario, the level of impact on land use and recreation would likely be reduced from those presented here.

6.12.1.4 The specific projects scoped into this CEA and the Tiers into which they have been allocated, are outlined in Table 6.37. The projects included as operational in this assessment have been commissioned since the baseline studies for Hornsea Three were undertaken and as such were excluded from the baseline assessment.

6.12.1.5 No Tier 1 projects have been identified and therefore, only Tier 2 and 3 assessments have been undertaken.

Table 6.37: List of other plans, projects and activities considered within the CEA.

Tier	Phase	Project/Plan	Closest distance from Hornsea Three	Details	Date of Construction (if applicable)	Overlap of construction phase with Hornsea Three construction phase	Overlap of operation phase with Hornsea Three operation phase
2	Construction/Operation and Maintenance/Decommissioning	C/7/2014/7030	0 m	A southern extension to Mangreen Quarry and ancillary works with progressive restoration to agriculture and nature conservation; retention of existing consented facilities; establishment of crossing point over Mangreen Lane; and proposed variation to approved restoration scheme. Approved 2 October 2015.	2017 to 2024.	Yes	No
	Construction/Operation and Maintenance/Decommissioning	2011/1804/O	0 m	Residential led mixed use development of 1196 dwellings and associated uses including Primary School, Local Services (up to 1,850 m^2sq.mtrs (GIA) of A1, A2, A3, A4, A5, D1 & B1 uses) comprising shops, small business units, community facilities/ doctors' surgeries, sports pitches, recreational space, equipped areas of play and informal recreational spaces. Extension to Thickthorn Park and Ride including new dedicated slip road from A11. Land North of Hethersett Village Centre, Little Melton. Approved 22 July 2013. Reserved matters (2015/1681) for appearance, layout, and scale and landscaping of the first phase of development for 126 dwellings in relation to outline permission 2011/1804. (Reserved matters approved 18 February 2016). Reserved matters (2017/0151)- proposed residential development (phase A1-B) comprising 91 dwellings including 20% affordable housing and associated open space and infrastructure. (Reserved matters approved 17 May 2017).	2017 to 2026	Yes	Yes
	Construction/Operation and Maintenance/Decommissioning	2013/0092	7 m	Outline application for up to 20 residential units and associated highways works with all matters reserved. Land South of Ringwood Close, Little Melton. Approved 22 July 2013.	2020 to 2021	Yes	Yes
	Construction/Operation and Maintenance/Decommissioning	2014/2611	21 m	The erection of 890 dwellings; the creation of a village heart to feature an extended primary school, a new village hall, a retail store and areas of public open space; the relocation and increased capacity of the allotments; and associated infrastructure including public open space and highway works. Land north and south of Dereham Road, Easton. Approved 1 November 2016.	2018 to 2028.	Yes	Yes
	Construction/Operation and Maintenance/Decommissioning	20170789	55 m	Erection of grain store (revised proposal). Approved 19 July 2017.	2020	Yes	Yes

Tier	Phase	Project/Plan	Closest distance from Hornsea Three	Details	Date of Construction (if applicable)	Overlap of construction phase with Hornsea Three construction phase	Overlap of operation phase with Hornsea Three operation phase
	Construction/Operation and Maintenance/Decommissioning	20170052	303 m	Greater Norwich Food Enterprise Zone, Land off Church Lane, Honingham. Approved 31 October 2017.	Unknown	Yes	Yes
	Construction/Operation and Maintenance/Decommissioning	2015/1697	312 m	Erection of 27 dwellings, access, roads, open space, parking areas and associated works. Land North of Gibbs Close, Little Melton. 27 June 2016.	2019 to 2020	Yes	Yes
	Construction/Operation and Maintenance/Decommissioning	2012/1836	338 m	Outline application for residential development (20 Dwellings) and associated infrastructure works, including highway improvement works at the Mill Road/School Lane/Burnthouse Lane junction. Land North of Gibbs Close, Little Melton. Approved 29 April 2014.	2018 to 2020	Yes	Yes
	Construction and Maintenance/ Decommissioning	2016/1303	699 m	Construction of a new field trials building with associated services yard and on-site parking and alterations to existing agricultural building. Land North of Bawburgh Road, Bawburgh Approved 05 September 2016	2020	Yes	Yes
	Construction/ Operation and Maintenance/Decommissioning	2015/2082	992 m	Outline application for the residential development of 10 dwellings. Land south of Village Hill, Bawburgh. Approved 22 June 2016.	2021 to 2022	Yes	No
3	Construction/ Operation and Maintenance/Decommissioning	EN10079	0 m	Norfolk Vanguard is a proposed offshore windfarm with an approximate capacity of 1800 MW off the coast of Norfolk. Pre-application stage. PEIR October 2017.	2020 to 2024	Yes	Yes

6.12.2 Maximum design scenario

6.12.2.1 The maximum design scenarios identified in Table 6.38 have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. The cumulative impact presented and assessed in this section have been selected from the details provided in the Hornsea Three project description (volume 1, chapter 3: Project Description), as well as the information available on other projects and plans, in order to inform a 'maximum design scenario'. Effects of greater significance are not predicted to arise should any other development scenario, based on details within the project Design Envelope, to that assessed here be taken forward in the final design scheme.

6.12.2.2 Other impacts included in the assessment of Hornsea Three (e.g. construction impacts on the coast) have not been included in the CEA as none of the projects identified in Table 6.37 are located near the coast, on access land or overlapping a recreational resource and therefore, a cumulative impact would not occur.

Table 6.38: Maximum design scenario considered for the assessment of potential cumulative impacts on land use and recreation.

Potential impact	Maximum design scenario	Justification
Construction phase		
Impacts of construction on ALC and farm holdings.	Tier 2 • 2015/2082 • 2014/2611 • 2013/0092 2015/ • 2015/1681 • C/7/2014/7030 • 20170052 • 20170789 • 2012/1836 • 2016/1303	These housing schemes and the Greater Norwich Food Enterprise Zone would lead to the permanent loss of agricultural land and could affect areas of the "best and most versatile" Grades 1, 2 and 3a agricultural land and farm holdings. The extension of Mangreen Quarry would be restored to agricultural land at the end of the construction period and would not therefore lead to cumulative permanent losses of agricultural land or permanent effects on farm holdings.
	Tier 3 Norfolk Vanguard EN010079.	The overlap of the onshore cable corridor associated with Vanguard windfarm with the Hornsea Three onshore cable corridor would be likely to lead to additional temporary losses of agricultural land quality and disruption to the operation of farm holdings in the vicinity of Salle during the construction phase or phases. At the end of the construction period, the onshore cable route for proposed Vanguard windfarm would be restored to agricultural land at the end of the construction period and would not therefore lead to cumulative permanent losses of agricultural land or permanent effects on farm holdings.
Impacts of construction may affect PRoWs. Impacts of construction may affect other linear routes.	Tier 3 Hornsea Three and Norfolk Vanguard EN010079. The proposed onshore cable route for Norfolk Vanguard crosses Reepham FP18 and the long-distance Marriott's Way and therefore there is a potential impact on these resources during construction. It is currently anticipated that the 'maximum design scenario' for Hornsea Three will be to cross Reepham FP18 and Marriott's Way by HDD. If, due to construction constraints posed by open-cut trenching, with Norfolk Vanguard, it is not possible to HDD under FP18, then this footpath would be diverted within the Hornsea Three order limits to maintain public access during the construction period with management measures put in place in accordance with the Outline CoCP (document reference A8.5) and the PRoW Management Plan (see Outline CoCP). Specific measures to address these matters during construction would be developed within a Hornsea Three/Norfolk Vanguard PRoW Interface Plan by Orsted and Vattenfall and agreed with Norfolk County Council and other relevant stakeholders.	Should these projects be constructed at the same time as Hornsea Three there is the potential for cumulative impacts on Reepham FP18 and other linear recreational routes.

6.13 Cumulative Effect Assessment

6.13.1.1 A description of the significance of cumulative effects upon land use and recreation receptors arising from each identified impact is given below. These only relate to the construction phase.

6.13.2 Construction phase

Impacts of construction on Agricultural Land Classification and farm holdings

Tier 2

Magnitude of impact

Agricultural Land Classification

6.13.2.1 Based on the assumption that the areas of land permanently affected within the cumulative schemes could include additional Grades 2 or 3a agricultural land, even though the definitive ALC grading of these areas is unknown, it is assessed that the magnitude of the impact on agricultural land from these schemes and Hornsea Three would be major.

Farm holdings

6.13.2.2 The cumulative magnitude of impact is assessed to be minor. Whilst the workability of individual farming enterprises may be affected, overall, farming operations can continue as before.

Sensitivity of receptor

Agricultural Land Classification

6.13.2.3 Based on the assumption that the areas of land within the cumulative schemes could include additional the "best and most versatile" Grades 2 or 3a agricultural land, it is assessed that these areas, together with the land within Hornsea Three, would be of medium sensitivity.

Farm holdings

6.13.2.4 The cumulative sensitivity of the resources affected is assessed to be medium, based on the dominance of arable cropping in the areas.

Significance of effect

Agricultural Land Classification

6.13.2.5 Overall, the sensitivity of the receptor is considered to be medium and the magnitude of the impact is deemed to be major. The effect is therefore assessed to be of **moderate adverse** significance, which is significant in EIA terms. The significance of effect is considered to be moderate as opposed to major due to uncertainty about the ALC grades of the areas affected by the cumulative developments (as outlined in 6.13.2.1).

Farm holdings

6.13.2.6 Overall, the sensitivity of the receptor is considered to be medium and the magnitude of the impact is deemed to be minor. The effect will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Tier 3

Impacts of construction on Agricultural Land Classification and farm holdings

Agricultural Land Classification and farm holdings

6.13.2.7 During the construction period, there would be additional temporary disturbance to areas of land within a large arable based farm holding and likely additional losses of the "best and most versatile" land where the Hornsea Three onshore cable corridor crosses the cable corridor of the Norfolk Vanguard project. Following construction, it is assumed that the land affected by the Norfolk Vanguard project at the crossing, and along the rest of the route, would be restored to its former agricultural use through the application of recognised best practice in the handling and restoration of soil resources. Given that the same restoration would occur along the Hornsea Three onshore cable corridor, it is considered that there would be no cumulative permanent losses of agricultural land.

Cumulative temporary impact on PRoWs and other linear routes

Tier 3

Magnitude of impact

6.13.2.8 There is the potential for cumulative effects on Reepham FP18, Marriott's Way and the B1145, all to the north of Reepham, as a result of Hornsea Three and the Norfolk Vanguard project. However, Hornsea Three will HDD under Marriott's Way and the B1145 and open-cut across Reepham FP18. Traffic management measures will be put in place for Hornsea Three to manage the interface between construction and non-construction traffic where required.

6.13.2.9 The timing and construction method of Norfolk Vanguard is not known at this time. However, if these works were to overlap, there would be potential for further disturbance to the use of these routes as a result of temporary diversions, temporary stopping up or traffic management. Where works on both projects overlap, measures will be identified to manage the interface and ensure the impact on these resources is reduced as far as is practicable. These measures would be captures within the Construction Traffic Management Plan (document reference A8.2), an outline of which accompanies the application. The impact will to be of local spatial extent, of short term duration, continuous and reversible. It is predicted that the impact will affect the receptors directly. The magnitude is therefore, considered to be minor.

Sensitivity of receptor

6.13.2.10 The receptors are deemed to be of low or medium importance and rarity and of local scale. The sensitivity of the receptor is therefore, considered to be low.

Significance of Effect

6.13.2.11 Overall, it is predicted that the sensitivity of the receptors is considered to be low and the magnitude is deemed to be minor. The potential temporary cumulative effect during the construction period will, therefore, be of **minor adverse** significance, which is not significant in EIA terms.

Future monitoring

6.13.2.12 No land use and recreation monitoring to test the predictions made within the construction phase cumulative impact assessment is considered necessary.

6.14 Transboundary effects

6.14.1.1 A screening of transboundary impacts has been carried out and is presented in volume 4, annex 5.4: Transboundary Impacts Screening Note. This screening exercise identified that there was no potential for significant transboundary effects with regard to land use and recreation from Hornsea Three upon the interests of other EEA States.

6.15 Inter-related effects

6.15.1.1 Inter-relationships are considered to be the impacts and associated effects of different aspects of the proposal on the same receptor. These are considered to be:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the project (construction, operation and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three key project stages (e.g. construction phase noise, operational noise and noise during decommissioning and dismantling at the onshore HVDC converter/HVAC substation sites); and
- Receptor led effects: Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on a given land use and recreation, such as PRoWs (e.g. construction dust and noise, increased traffic and visual change etc.) may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

6.15.1.2 A description of the likely inter-related effects arising from Hornsea Three on land use and recreation is provided in chapter 11: Inter-Related Effects (Onshore).

6.16 Conclusion and summary

6.16.1.1 A summary of the likely environmental effects on ALC and farm holdings is set out in Table 6.39. This illustrates that during the construction phase there would be a permanent loss of land predominantly associated with the onshore HVAC booster station and onshore HVDC converter/HVAC substation, together with the temporary loss of the “best and most versatile” agricultural land along the Hornsea Three onshore cable corridor. Following the completion of the construction phase or phases and the restoration of temporarily affected land to its former agricultural use, as far as possible, the permanent loss of ALC would be of **moderate adverse** significance.

6.16.1.2 During the construction phase, there would be potential temporary effects on approximately 44 farm holdings and the permanent loss of land from agricultural production associated with the onshore HVAC booster station and the onshore HVDC converter/HVAC substation. During this period there could be disruption to farming management, including changes to farm access within individual fields and along local roads, as well as temporary effects on field drainage and irrigation systems. Following construction, the restoration of soils along the Hornsea Three onshore cable corridor would enable the land to be returned to its former agricultural use and returned to the farm holdings of which it forms part but there would still be permanent loss of land predominantly from three large arable based farm holdings which is assessed to have a **minor adverse** effect on farm holdings during operation.

6.16.1.3 It is assumed that the onshore export cables would be left in place in the ground after decommissioning. In addition, the onshore HVAC booster station and onshore HVDC converter/HVAC substation would be removed and the site reinstated to an agricultural use or made available for alternative use. The onshore HVAC booster station and onshore HVDC converter/HVAC substation areas may be restored, as far as possible, to their original physical characteristics. However, to assess the maximum design scenario, it is assumed that there would be a likely reduction in the quality of the land associated with the removal of onshore HVAC booster station and onshore HVDC converter/HVAC substation areas and reinstatement of soils in these areas and therefore that the permanent loss of agricultural land quality in these areas remains. The effects on both ALC and farm holdings would therefore be the same as during operation.

6.15.2.1 A summary of the potential environmental effects on recreational resources is set out in Table 6.39 below. This shows that during the construction phase of Hornsea Three there would be a **negligible** effect on the recreational use of the coast at Weybourne and **minor adverse** effects on the following recreational resources.

- Access land at Bodham;
- Roads and tracks to and within the Muckleburgh Military Collection;
- The Foxhills camping site at Weybourne and Kelling Heath;
- Local PRoWs; and
- Local cycle routes and other recreational routes.

6.15.2.3 At the Hornsea Three landfall area, construction works have the potential to result in a **moderate adverse** effect on a section of the Peddars Way and Norfolk Coast Path National Trail at Weybourne, although this would depend on the method of construction and the construction phasing.

6.15.2.4 Following the completion of the construction works all areas of access land, recreational resources, PRoWs and other linear routes affected by the onshore works would be re-instated to their current condition and/or along their current alignments. There would be no physical effects on these resources arising from the operation and maintenance of Hornsea Three.

6.15.2.5 During decommissioning it is anticipated that the onshore export cables corridor be left in place and the permanent onshore HVAC booster station and onshore HVDC converter/HVAC substation would be decommissioned and removed from the site. The site would then either be reinstated to its original use or an alternative use. These activities would not result in any impacts on recreational resources within the Hornsea Three land use and recreation study area although traffic management measures may be required should access to the site for these purposes need to cross any PRoWs or other linear recreational routes.

6.16.1.4 Screening of potential transboundary impacts (as presented in volume 4, annex 5.4: Transboundary Impacts Screening Note) has identified that there was no potential for significant transboundary effects with regards to land use and recreation.

Table 6.39: Summary of potential environment effects, mitigation and monitoring.

Description of impact	Measures adopted as part of Hornsea Three	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Construction phase							
Impacts of construction on ALC Classification	Soil Management Strategy (see Outline CoCP, document reference A8.5)	Moderate	Medium	**Moderate Adverse** (significant in EIA terms)	None	N/A	None
Impacts of construction on farm holdings	Maintenance of farm accesses; water supplies and drainage. Fencing of construction works.	Minor	Medium	**Minor Adverse** (not significant in EIA terms)	None	N/A	None
Impacts of construction may affect recreational use of the coast - at Weybourne	Large areas to the east and west of the intertidal activities would remain available. Management and safety measures in accordance with the Outline CoCP (document reference A8.5) would be put in place around construction works.	Minor	Low	**Negligible** (not significant in EIA terms)	None	N/A	None
Impacts of construction may affect recreational resources (i.e. access to and within)	Temporary measures in accordance with the Construction Traffic Management Plan (document reference A8.2).	Minor	Medium	**Minor Adverse** (not significant in EIA terms)	None	N/A	None
Impacts of construction may affect national PRoWs	Temporary diversions or traffic management as required.	Moderate (Peddars Way/Norfolk Coast Path)	High	**Moderate Adverse** (significant in EIA terms)	None	N/A	None
Impacts of construction may affect local PRoWs	Temporary diversions or traffic management as required.	Minor	Low	**Minor Adverse** (not significant in EIA terms)	None	N/A	None
Impacts of construction may affect linear routes	Temporary measures in accordance with the Construction Traffic Management Plan (document reference A8.2).	Minor	High (NCR1) Low (other routes)	**Minor Adverse** (not significant in EIA terms)	None	N/A	None
Operation and Maintenance phase							
Impacts of operation and maintenance may affect Agricultural Land Classification	None proposed	Moderate	Medium	**Moderate Adverse** (significant in EIA terms)	None	N/A	None
Impacts of operation and maintenance may affect farm holdings	None proposed	Minor	Medium	**Minor Adverse** (not significant in EIA terms)	None	N/A	None
Decommissioning phase							
Impacts of decommissioning may affect Agricultural Land Classification	Soil Management Strategy (see Outline CoCP, document reference A8.5)	Minor	Medium	**Minor Adverse** (not significant in EIA terms)	None	N/A	None

Description of impact	Measures adopted as part of Hornsea Three	Magnitude of impact	Sensitivity of receptor	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Impacts of decommissioning may affect farm holdings	None proposed	Negligible-Minor	Medium	**Minor Adverse** (not significant in EIA terms)	None	N/A	None

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