FOREWIND

DOGGER BANK
TEESSIDE A & B

March
2014

Environmental Statement Chapter 21 Appendix A Landscape and Visual Impact Assessment

Application Reference: 6.21.1

Cover photograph: Indicative image showing installation of meteorological mast within the Dogger Bank Zone

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Dogger Bank Teesside A & B: Landscape and Visual Impact Assessment

Technical Report

Prepared by LUC on behalf of Forewind
March 2014

Project Title: Dogger Bank Teesside A & B Landscape and Visual Impact Assessment

Client: Forewind

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1 Introduction

Overview

1.1 The Landscape and Visual Impact Assessment (LVIA) presented in this Technical Report considers the potential impacts on the landscape and on views arising from the onshore grid connection works associated with Dogger Bank Teesside A & B. The LVIA was undertaken by chartered landscape architects at LUC, on behalf of Forewind, as part of the Environmental Impact Assessment (EIA).

1.2 Dogger Bank Teesside A & B is the second stage of development of the Dogger Bank Round 3 Zone development. This second stage will comprise two wind farms (Dogger Bank Teesside A and Dogger Bank Teesside B), each with a maximum installed capacity of 1.2GW. At the start of the project development process for Dogger Bank Teesside in March 2012, Forewind notified the Secretary of State (SoS) of its intention to undertake an EIA and provide an ES in respect of Dogger Bank Teesside. At this time, Dogger Bank Teesside was referring to four projects, Dogger Bank Teesside A, B, C and D.

1.3 In December 2012 Forewind decided and informed the Planning Inspectorate and all consultees prescribed by the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 that the optimum consenting strategy for Dogger Bank Teesside was to split the development into two separate DCO applications. The first DCO application (this application) is seeking consent for Dogger Bank Teesside A & B, located within Tranches A and B of the Dogger Bank Zone.

1.4 This LVIA considers the onshore elements of Dogger Bank Teesside A & B only. Each project is described in full in **Chapter 5 Project Description** of the Environmental Statement (ES) but in outline the onshore development landward of the Mean High Water Mark (MHWM) comprises:

- Cable landfall and HDD compounds;
- Transition bays;
- Two buried onshore High Voltage Direct Current (HVDC) export cable systems, carrying power from the landfall to the onshore converter stations;
- Horizontal Directional Drilling (HDD) under roads, foreshore, railway, watercourses, pipelines and potentially other cables;
- Two onshore converter stations (one per project, which are co-located) with associated access roads, compounds, fencing, landscaping and drainage;
- Two onshore High Voltage Alternating Current (HVAC) export cable systems, carrying power from the onshore converter stations to the existing NGET substation at Lackenby;
- Connection bay within the existing National Grid Electricity Transmission (NGET) substation at Lackenby containing isolation switchgear and electrical equipment for connection of the export cable systems to the transmission network;
- Temporary works and laydown areas;
- Permanent and temporary access roads; and
- Service corridors, including telecommunications, water and connection to the local electricity network.

1.5 The approximately 9km long cable route will come onshore to the north of Marske-by-the-Sea, where it will cross under the railway line and Redcar Road, south of the Marske Sewage Treatment Works. The route will then head south to the A174, and primary construction compounds will be sited at this location. The cable route will then cross agricultural fields south of

Grewgrass Farm and north of Fell Briggs Farm, Thrushwood Farm and the village of Yearby until it reaches the Wilton complex, where the converter stations and associated infrastructure will be located. The HVDC will be converted to HVAC at the converter stations and connect into the existing NGET substation at Lackenby, to the west of the A1053, via an HVAC cable. HDD techniques will be used to cross significant obstacles such as watercourses, railway lines and major roads, where trenching cannot be achieved.

1.6 The approach to the landscape and visual impact assessment (LVIA) was informed by current good practice guidance prepared by the Landscape Institute and the Institute of Environmental Management and Assessment (2002). Since the work was prepared, the Third Edition of the Guidelines for Landscape and Visual Impact Assessment has been published (April 2013). It is recognised that the principles and approach advocated in this latest version of the guidance does not differ from earlier versions, and that its main purpose is to seek to achieve more consistent use of terms between professionals, and to ensure that the process is as transparent as possible. The Landscape Institute has published a statement clarifying that assessments carried out under earlier versions of guidance retain their validity. It has been judged that the application of the new guidance would make no material difference to the conclusions of the landscape and visual impact assessment presented in this chapter.

1.7 The assessment considers impacts on landscape and visual resources during construction, operation and decommissioning. The assessment of impacts on seascape and visual resources arising from the offshore components of the project (offshore wind turbines) is provided in **Chapter 20 Seascape and Visual Impact Assessment** of the ES.

1.8 For further information on legislation and policy please refer to **Chapter 3 Legislation and Policy** of the ES, for terrestrial ecology see **Chapter 25 Terrestrial Ecology**, and for cultural heritage refer to **Chapter 27 Terrestrial Archaeology**.

Impacts Assessed in this Technical Report

1.9 Potential impacts on landscape, including impacts on landscape resources and character, and visual amenity, and how those changes could affect designated landscapes, have been assessed and are described.

1.10 Potential impacts on landscape and visual amenity which are examined in full are those as a consequence of:

- Installation of the landfall and the onshore HVDC and HVAC cable routes and modification works at the existing NGET substation at Lackenby; and
- Construction, operation and decommissioning of the converter stations.

1.11 The assessment of impacts resulting from the above upon the landscape as a whole, and upon views and visual amenity is broken down into an examination of:

- Direct impacts upon landscape resources (sometimes described as landscape elements);
- Impacts upon landscape character (examined with reference to the landscape character areas into which the study area is divided);
- The consequential impacts of changes in character upon any designated landscapes; and
- The consequential impacts of changes in character upon views and visual amenity (examined with reference to assessment viewpoints and illustrated with photomontage visualisations where appropriate).

1.12 The landfall and cable route comprise works which once operational will be underground, with the exception of occasional cable markers. There will therefore be no impacts on the landscape or visual amenity arising from their operation, and so these are not considered further. Consideration of short term residual impacts that may occur post-construction are however included (i.e. changes in appearance of the landscape during the time taken for reinstatement of vegetation above the buried infrastructure).

1.13 For the same reason, cumulative impacts of the operational landfall and cable route when considered alongside other proposed projects along/near to the cable route are also not considered further. Cumulative impacts of the landfall and cable route during operation will not be significant, as the operational impacts of the landfall and cabling works themselves will not be significant.

1.14 Cumulative impacts of the landfall and cable route during construction and decommissioning, and cumulative impacts of the converter stations in relation to construction, operation and decommissioning, are considered within the cumulative section of this report (see **Section 10**).

2 Guidance and Consultation

Policy

National Policy Statements

2.1 The LVIA has been undertaken with reference to the relevant National Policy Statements (NPS) which form the primary national guidance documents for Nationally Significant Infrastructure Projects (NSIP). These documents set out the assessment requirements for landscape, seascape and visual impact assessment.

2.2 The relevant NPS for Dogger Bank Teesside A & B include:

- Overarching National Policy Statement for Energy (EN-1) (DECC 2011a);
- NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b); and
- NPS for Electricity Network Infrastructure (EN-5) (DECC 2011c).

2.3 The assessment requirements and guidance pertaining to LVIA, as they are defined in these documents, are summarised in outline here, together with an indication of the section numbers in the technical report where each is addressed. Where any part of the NPS has not been followed within the assessment an explanation is provided as to why it was not considered relevant, or has been addressed elsewhere in the ES. Current legislation and policy relevant to Dogger Bank Teesside is described in full in **Chapter 3** of the ES.

2.4 A requirement for the LVIA to make reference to existing landscape character assessments and associated studies is set out in Section 5.9.5 of EN-1. Details of the national and local landscape character assessments which have informed the baseline of the LVIA are provided in **Section 4**. In addition there is a requirement to take account of policies within local development documents which are underpinned by these studies. Details of the specific local planning policies relevant to landscape and visual amenity are provided later in this section.

2.5 Generic requirements relating to visual amenity are included in Section 5.9.7 of EN-1 as follows:

"*The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include light pollution impacts, including on local amenity, and nature conservation.*"

2.6 An assessment is made of the impacts on visual amenity during the construction, operation and decommissioning of the onshore components of the projects in **Sections 7**, **8** and **9**. This includes impacts resulting from lighting.

2.7 Impacts on nationally designated landscapes and landscapes with local amenity value are addressed in Sections 5.9.9 to 5.9.16 of EN-1. Where infrastructure is located outside a nationally designated area:

"*The aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraints*".

2.8 It also recognises that landscapes outside these areas may be valued locally and protected by local landscape designations. Where relevant, attention should be paid to landscape character assessments on which local development policies and local landscape designations are based. Details of the specific local landscape designations relevant to the study area are provided in **Section 5**.

2.9 Section 2.4.2 of EN-3 requires proposals for renewable energy infrastructure "*demonstrate good design in respect of landscape and visual amenity*". This assessment provided details of

mitigation measures embedded in the design and how a consideration of landscape and visual amenity has informed the process of site selection and siting of the development.

2.10 Section 2.8.5 of EN-5 makes reference to the Holford Rules as appropriate industry guidelines for routeing overhead power lines that should be followed by developers when designing proposals. As described in **Section 6** of the assessment, a decision was made early on to underground the Dogger Bank Teesside A & B onshore HVDC and HVAC cable route. Never-the-less, the key principles of the Holford Rules have been considered as part of the embedded mitigation measures set out in **Section 6** of this report.

Local Planning Policy

2.12 EN-1 states at Section 4.1.5 that:

"*Other matters that the Infrastructure Planning Commission (IPC) may consider important and relevant to its decision-making may include Development Plan Documents or other documents in the Local Development Framework.*"

2.13 **Table 2.1** provides details of the local planning policy documents and the policies contained within these of relevance.

Table 2.1 Local planning policy

Documents	Policy / Guidance	
Redcar and Cleveland Local Development Framework (adopted July 2007) (Due to be replaced by new Local Plan)	CS25	This policy, primarily concerned with the protection and enhancement of the built and historic environment, states: *"…The character of the built and historic environment will be protected, preserved or enhanced. Particular protection will be given to the character and special features of:* *a) Conservation areas;* *b) Listed buildings;* *c) Historic parks and gardens;* *d) Archaeological sites; and* e) *The historic landscape of the Eston Hills…"*
	DP2	*"In assessing the suitability of a site or location, development will be permitted where it:…* *c) does not cause a significant adverse impact on the amenities of occupiers of existing or proposed nearby properties;* *d) does not result in the unacceptable loss or significant adverse impact on important open spaces or environmental, built or heritage assets which are considered important to the quality of the local environment;* *e) minimises any adverse impact on the overall character of the streetscape or landscape of the area;* f) *minimises the loss of best and most versatile agricultural land…"*
	DP3	*"All development must be designed to a high standard. Development proposals will be expected to…respect or enhance the landscape, biodiversity, geological and heritage designations or assets that contribute positively to the site and surrounding area…"*
	DP9	This policy, primarily concerned with the protection and enhancement of the built and historic environment, states: *"Development within or otherwise affecting the setting of a conservation area will only be permitted where it preserves or enhances the character or appearance of the conservation area…"*

Other Legislation, Standards and Guidance

2.14 The methodology for the LVIA was informed by current guidelines and was undertaken following the approach set out in *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and Institute of Environmental Management and Assessment 2nd Edition 2002) and taking cognisance of the very recent Third Edition (2013).

2.15 Other guidance documents referred to include:

- Countryside Agency and Scottish Natural Heritage (SNH), 2002. Landscape Character Assessment: Guidance for England and Scotland;
- Countryside Agency and SNH, 2004. Landscape Character Assessment: Guidance for England and Scotland - Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity; and
- Landscape Institute, 2011. Advice Note 01/11 Use of Photography and Photomontage in Landscape and Visual Assessment.

2.16 Reference was also made to the following:

- National Grid Company (NGC) *"The Holford Rules"* (1993) http://www.nationalgrid.com/NR/rdonlyres/E9E1520A-EB09-4AD7-840B-A114A84677E7/41421/HolfordRules1.pdf;
- National Grid Company (NGC) *"The Horlock Rules"* National Grid Guidance on Siting of Substations http://www.nationalgrid.com/uk/Electricity/MajorProjects/NorthWestCoastConnections/Documents/Index.htm; and
- Highways Agency, 2012. *Design Manual for Road and Bridges Volume 11* http://www.dft.gov.uk/ha/standards/dmrb/.

Consultation

2.17 To inform the ES, Forewind has undertaken a thorough pre-application consultation process, which has included the following key stages:

- Scoping Report submitted to the Planning Inspectorate (May 2012);
- Scoping Opinion received from the Planning Inspectorate (June 2012);
- First stage of statutory consultation (in accordance with Sections 42 and 47 of the Planning Act 2008) on Preliminary Environmental Information (PEI) 1 (report published May 2012); and
- Second stage of statutory consultation (in accordance with sections 42, 47 and 48 of the Planning Act 2008) on the ES (published November 2013) designed to allow for comments before final application to the Planning Inspectorate).

2.18 In addition, consultation associated with the Dogger Bank Creyke Beck application (Forewind August 2013) has been taken into account for Dogger Bank Teesside A & B where appropriate.

2.19 In between the statutory consultation periods, Forewind consulted specific groups of stakeholders on a non-statutory basis to ensure that they had an opportunity to inform and influence the development proposals. Consultation undertaken throughout the pre-application development phase has informed Forewind's design decision making and the information presented in this application. Further information on the consultation process is presented in **Chapter 7** Consultation. A Consultation Report is also provided alongside this ES as part of the overall planning submission.

2.20 LUC has undertaken specific consultation with statutory consultees to establish the scope of the landscape and visual assessment, the methodology and approach to the LVIA as well as the assessment viewpoints to be used.

2.21 A summary of the consultation carried out at key stages throughout the project, of particular relevance to Landscape and Visual Impact, is presented in **Table 2.2**. This table only includes the

key items of consultation that have defined the assessment. A considerable number of comments, issues and concerns raised during consultation have been addressed during consultation meetings and hence have not resulted in changes to the content of the ES. In these cases, the issue in question has not been captured in **Table 2.2**. A full explanation of how the consultation process has shaped the ES, as well as tables of all responses received during the statutory consultation periods, is provided in the Consultation Report. Forewind's Consultation with landowners and tenants is ongoing and will inform the final landscape mitigation plans (see **Section 7**, paragraph **7.24** for further details).

Table 2.2 Consultation

Consultee	Scoping / other consultation	Summary of issue raised	Response / ES reference
Redcar and Cleveland Borough Council (RCBC)	Scoping Opinion (June 2012)	Agreed that the LI and IEA's Guidelines for Landscape and Visual Impact Assessment (2nd edition, 2002) and Landscape Character Assessment: Guidance for England and Scotland (Countryside Agency & Scottish Natural Heritage) are the appropriate guidance to follow. Agreed viewpoints proposed cover the keys views into the site; Viewpoints 2, 3, 7, 8 and 11 considered to be of particular importance. 1km study area from cable route and 5km study are from convertor station were considered to be acceptable.	Relevant guidance set out in **Section 2**, Other Legislation, Standards and Guidance in this report. Reference made to published guidance on landscape character in **Section 4** and **Tables 4.1** and **4.2** in this report.
Joint National Conservation Committee (JNCC)	Scoping Opinion (June 2012)	Concerning landscape/seascape and visual impacts of development, the key issues that we need to focus on will be: 1. Direct impacts, or physical change, to the landscape (i.e. impacts on the fabric/elements of the landscape, for example landform changes, vegetation changes); 2. Indirect impacts on the character and quality of the landscape; 3. Direct impacts on the visual amenity of visual receptors, for example changes in views and their content for stakeholders; 4. Indirect impacts on visual receptors in different places, for example an altered visual perception leading to changes in public attitude, behaviour and how they value or use a place. Proposals to incorporate measures to help encourage people to access the countryside will be encouraged, and links to other green networks and, where appropriate, urban fringe areas should also be explored. Relevant aspects of local authority green	The assessment considers direct and indirect impacts on the landscape and views, as detailed in **Section 3**, Methodology. Relevant local authority green infrastructure strategies will be taken account of in the development of the detailed landscape design, post application, if practicable, and in liaison with the local authority. The proposal is located within an industrial complex. As such, public access and provision for recreation is not appropriate in this context. Details of the development of the siting and design as it relates to local landscape character are described in **Sections 5** and **6** of this report.

Consultee	Scoping / other consultation	Summary of issue raised	Response / ES reference
		infrastructure strategies should be incorporated where appropriate. All new development should consider the character and distinctiveness of the area, to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness. The siting and design of the proposed development should demonstrate that local design characteristics and, wherever possible, the use of local materials has been considered.	
RCBC	Non-statutory (December 2012)	Viewpoint selection considered acceptable, giving wide coverage of views.	Further details are provided in paragraph 4.55 and **Table 4.4**.
Natural England	Non-statutory (January 2013)	Viewpoint selection and study area considered to be suitable.	Further details are provided in paragraph 4.55 and **Table 4.4**.
RCBC	Non-statutory (August 2013)	Relevant impacts resulting from the development have been identified with appropriate mitigation being proposed especially based around the sub-station and edge of Lazenby village.	The assessment considers direct and indirect impacts on the landscape and views, as detailed in **Section 3** Methodology.
Natural England	Non-statutory (September 2013)	Natural England welcomes the use of the approach set out in the Guidelines for Landscape and Visual Impact Assessment. The converter stations site is located just over 5km from the North York Moors National Park. Natural England are satisfied that at this distance it is not likely to impact on the purposes of designation of the National Park.	Relevant guidance is set out in **Section 2** Guidance and Consultation. Designated landscapes within or close to the study area are discussed within **Section 4** Existing Environment.
RCBC	Statutory (November 2013)	The proposed works and mitigation works are considered to be acceptable. The proposed mitigation works at the southern end of the Wilton Site adjacent to Lazenby are considered to provide a suitable level of screening.	Further details are provided in paragraph 7.24.
Local resident	Statutory (December 2013)	A comment received at the exhibition requesting information about whether it is possible to raise the height of the existing mounds.	Extensions to two existing bunds to the north east of Lazenby are proposed as part of the indicative landscape mitigation plan, in order to reduce visual impacts of the Dogger Bank Teesside A & B converter

Consultee	Scoping / other consultation	Summary of issue raised	Response / ES reference
			stations. It is not within Forewind's remit to design the bunding for future developer's projects located within the Wilton Complex. Further details on the proposed mitigation measures are provided in paragraph 7.24.

3 Methodology

Introduction

3.1 This section sets out the methodology used in the assessment, in accordance with current good practice guidance listed in **Section 2**. The methodology is applicable to the assessment of temporary short term impacts and medium term impacts, including those during the construction and decommissioning of the project, and the long term impacts during operation. The assessment includes a series of mitigation measures, including planting, and this section provides an overview of the approach taken.

3.2 In this report landscape assessment is distinguished from visual assessment. Landscape resources and character are considered to be of importance in their own right and are valued for their intrinsic qualities regardless of whether they are seen by people. Impacts on views and visual amenity as perceived by people are clearly distinguished from, although closely linked to impacts on landscape, and are a consequence of changes in the latter. Landscape and visual assessments are therefore separate, but linked processes.

3.3 The methodology adopted for the assessment of the seascape and visual impacts arising from the cable landfall works and the installation offshore sections of the HVDC export system within the inshore waters is provided within the Seascape and Visual Impact Assessment (SVIA) in **Chapter 20**.

Study Area

Landfall, HVDC and HVAC Cable Routes and Modification Works at the Existing NGET Substation at Lackenby

3.4 The cable route construction working area will include two temporary haul roads, two trenches (one for each of the two buried cable systems), topsoil and subsoil storage. Several construction compounds are proposed along the cable route. Direct impacts on the landscape will be contained within the cable route's 'working width', which encompasses the corridor of land which will be disturbed during construction, including at the location of construction compounds.

3.5 The proposed location of the enabling works at the existing NGET substation at Lackenby will be contained within the substation boundary. No new overhead lines or security fencing is proposed. The modification works will be of the same scale, height and nature as the existing infrastructure present. The works will include an extension to the switchgear buildings. At the time of the assessment, this is likely to be located within the southeast substation. Visibility of the modification works is therefore likely to be limited to the area immediately surrounding the southeast of the existing NGET substation at Lackenby (primarily Crow Lane).

3.6 In order to capture potential significant landscape and visual impacts, the study area has been defined as comprising a 2km wide corridor along the length of the cable routes. . It is considered that due to the relative simplicity of the landscape and topography and the scale and nature of the development, construction operations associated with the buried cables will be immediately visible from no more than 1km away. The study area for the cable route is therefore taken as comprising a 2km wide study area along the length of the HVDC cable route (between the landfall and the converter stations site) and the HVAC cable route (between the converter stations site and the existing NGET substation at Lackenby), as shown in **Figure 3.1**. This was agreed in consultation with RCBC and Natural England (**Table 2.2**).

Converter Stations Site

3.7 The converter stations site is located on an area of agricultural land in the south of the Wilton Complex. The site is separated from the settlement of Lazenby and the A174 by agricultural fields containing planted woodland set on top of bunding. Industrial infrastructure is located immediately adjacent to the site to the north. The Wilton Centre to the east comprises a complex of office and laboratory buildings.

3.8 The study area was defined based on desk studies and field surveys examining the existing landscape surrounding the proposed converter stations, and with the use of Zone of Theoretical Visibility (ZTV) mapping, as shown in **Figures 3.2 - 3.4** (see paragraph 3.17).

3.9 Baseline studies and field work indicated that the topography surrounding the site, woodland and bunds to the south, west and east, and industrial development to the north, as well as the nature of the development proposed, is such that the proposed converter stations would be very unlikely to give rise to significant impacts from more than 3km away. However, in order to examine potential impacts, and taking a precautionary approach, the converter stations study area extends to a radius of 5km centred upon the converter stations site, as agreed in consultation with RCBC and Natural England. The location of the study area is shown in **Figure 3.1**.

Recording and Evaluating the Existing Environment

Landscape Baseline

3.10 The following are mapped and considered as part of the LVIA baseline:

- Designated landscapes - areas designated for their landscape quality or value at the national, regional or local level, e.g. National Parks, Areas of Outstanding Natural Beauty (AONBs), Heritage Coasts and areas of local landscape value (which may have varying names);
- Landscape resources - the components, elements or features that make up the landscape including landform, trees, hedgerows, woodlands and water features; and
- Landscape character - the distinct and recognisable pattern of elements (for example associations of field patterns) that occur consistently in a particular type of landscape and create a particular sense of place.

Visual Baseline

3.11 The visual baseline is described in terms of views from representative viewpoints as well as views from other sensitive visual receptors within the study area. A viewpoint will typically represent an area over which a broadly similar perspective of the development site is obtained. The sensitivity of the viewers at a particular viewpoint depends upon the activity of the viewers and the extent to which they could be affected by changes in their view.

Representative viewpoints

3.12 Representative viewpoints form the basis of the assessment of impacts on views, in line with the *Guidelines for Landscape and Visual Impact Assessment*[1]. Viewpoints within the study area were selected through desk study, field work and in consultation with RCBC and Natural England. The viewpoints were selected because they:

- Include the nearest residents and the clearest viewpoints of the site;
- Provide a representative range of viewing distances (i.e. short, medium, and long range views);
- Represent a range of viewing experience (i.e. static views, from residential properties and points from sequential views, for example from roads and footpaths); and

[1] The Landscape Institute and the Institute of Environmental Management and Assessment, 2002. Guidelines for Landscape and Visual Impact Assessment. 2nd ed. London and New York: Spon Press

- Have a reasonably high potential number of viewers or area of particular importance to the viewers affected.

Data Sources

3.13 The principal sources of information about the landscape designations and the character of the study area used in this assessment are:

- Carl Bro and Golder Associates (2005) Countryside Character of England Volume 1: North East, Character Area 23 Tees Lowland and Character Area 25 North Yorkshire Moors and Cleveland Hills Landscape;
- RCBC (2006) Redcar and Cleveland Landscape Character Assessment ; and
- RCBC (2010) Redcar and Cleveland Local Development Framework, Landscape Character SPD.

Mapping

- Ordnance Survey (OS) Maps:
  - Landranger 1:50,000 Scale;
  - Pathfinder 1:25,000 Scale;
  - Online map search engines; and
  - British Geological Society, 1979. Geological Map, Solid, North.

Modelling

- Landform Panorama Data at 1:50,000 (containing 3-D contour information at 10m intervals, reported as being accurate to ±3m);
- Raster Data at 1:50,000 (to show surface details such as roads, forest and settlement detail equivalent to the 1:50,000 scale Landranger maps); and
- Raster Data at 1:250,000 (to provide a more general location map).

Field Survey

3.14 Field survey work was carried out during several visits under differing weather conditions between November 2012 and April 2013, and records were made in the form of field notes and photographs. Field survey work included a visit to the site, visits to viewpoints and designated landscapes, and extensive travel around the study area to consider potential impacts on landscape character and on experiences of views seen from routes.

3.15 Surveys were undertaken primarily from publically accessible locations. Access was arranged to private land within the Wilton Complex and surrounding agricultural land to undertake survey work and viewpoint photography around the converter stations site.

3.16 Surveys within the cable route study area were only undertaken from publically accessible locations and no access was arranged to private land.

Zone of Theoretical Visibility Mapping and Visualisations

Zone of Theoretical Visibility Mapping (ZTV)

3.17 A series of ZTV maps were prepared to inform an understanding of the theoretical extent to which the proposed converter stations will be visible. ZTVs are prepared using specific computer software designed to calculate the theoretical intervisibility between the potential development and their surroundings.

3.18 ZTVs provide an initial indication of potential visibility. Actual visibility across the study area is strongly influenced by the presence of screening in the form of localised topography, vegetation (including woodland), buildings and other infrastructure. ZTVs can be used as a tool to help give an understanding of potential visibility, but are not a substitute for examination in the field.

3.19 ESRI ArcGIS version 10.1 software with a Spatial Analyst extension was used to generate the ZTV. The programme calculates areas from which the proposed converter station halls, these being the main visible elements, are potentially visible.

3.20 The modelling parameters for the converter station halls (i.e. structure dimensions and indicative locations) were agreed with Forewind Ltd prior to producing the ZTV. Surface Digital Terrain Model (DTM) data was purchased.

3.21 In order to model the converter station halls, a theoretical 'block building' was generated in GIS using a series of points to represent its footprint and height. The theoretical block represents the maximum dimensions of the built components for the converter stations. .

3.22 ZTVs were generated based on a 'bare ground' Digital Terrain Model (DTM), with added landscape features elevated to an average height to take account of buildings and woodland areas. The DTM used was gridded Ordnance Survey (OS) Landform Profile data with a resolution of 10m. The additional features were extracted from OS MasterMap for selected nearby features and OS VectorMap District (Woodland and Buildings layers) for the other features. Due to their variable size and potential for screening, hedgerows were not modelled in the ZTV. The computer calculates visibility between the centre point of each 10m x 10m grid square at eye height and key points of the converter halls at roof height.

Visualisations

3.23 Visualisations aim to represent an observer's view of a proposed development. The visualisations take the form of photographs and photomontages from representative viewpoints. The methodology for production of the visualisations is based on the GLVIA and the Landscape Institute Advice Note 01/11 *Photography and photomontage in landscape and visual impact assessment*.

Photography

3.24 The camera used for the photography is a Nikon D90 with a fixed 35mm focal length lens (equivalent to a 52mm focal length lens on a standard 35mm film camera). These focal lengths are in accordance with recommendations contained in the *Guidance for Landscape and Visual Impact Assessment* and the Landscape Institute's *Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment*.

3.25 A tripod with vertical and horizontal spirit levels is used to ensure a level set of adjoining images. The tripod is set to hold the camera at approximately 1.5m above ground level. A panoramic head is used to ensure the camera lens is positioned and rotated on the no-parallax[2] point in order to enable accurate stitching of the successive images. The camera is moved through increments of 15 degrees and rotated covering up to 360 degrees at each viewpoint. This enables a minimum view angle of 90 degrees centred on the view towards the proposed converter stations to be cut from the overall 360 degrees. The OS coordinates of the viewpoint locations, date and time, weather conditions are recorded.

Photo-Stitching

3.26 Photo-stitching software (Panorama Factory) is used to piece together the adjoining frames to form panoramic images. An image with a horizontal field of view of 90 degrees, centred on the converter station(s), is selected for each viewpoint to reveal the key characteristics of the view.

Digital Terrain Model

3.27 A 3D landform model of the study area is created using gridded Ordnance Survey Land-Form Profile data. This data is in OS National Grid coordinates and consists of height values (metres AOD) at each intersection of a 10m horizontal grid. From this model, wireframe views are produced to show the profile of the terrain from the selected viewpoints.

3D model of the development

3.28 A 3D digital model is created of the proposed development. All components are modelled to their correct size and design directly from geo-referenced CAD drawings showing the indicative site

[2] Parallax = The difference between what is seen through the viewfinder and what the camera records on film.

layout plans and elevations. Additionally, some of the existing structures close to or within the site boundary are modelled as marker points to assist in aligning the views.

3.29 Any landform proposals are then integrated into the CAD site drawing and modelled as 3D elements. The 3D model is positioned using OS National Grid X, Y and Z coordinates from the Digital Terrain Model.

3.30 The selected viewpoints are added to the model using on site Global Positioning System (GPS) readings to record correct locations and views are created within the software using identical camera parameters. These camera views are then rendered using realistic lighting settings to match the conditions present at the time of photography.

Producing Visualisations

3.31 Visualisations are created by superimposing both the wireframe views from the Digital Terrain Model and the rendered images from the 3D model onto the panoramic photographs to ensure the landform and existing structures are accurately located.

Mitigation Measures

3.32 Mitigation measures to reduce adverse impacts and enhance positive impacts of the project were developed as part of an iterative landscape and visual impact assessment process. Two types of mitigation measures are distinguished:

- Measures embedded into the siting and design, i.e. decisions made in order to improve the project from a landscape and visual perspective; and
- Proposed additional measures designed to reduce adverse landscape and visual impacts in the short to medium term during construction, and those in the long term during operation (additional to embedded design measures and standard construction practices for avoiding and reducing environmental effects).

3.33 Embedded measures include routing of the cabling and siting and design of the converter stations. Proposed additional mitigation includes details of post-construction restoration measures and those which aim to reduce long term landscape and visual impacts during operation, such as soft landscaping (planting), earth works (bunding) and recommendations for potential landscape or habitat enhancement measures.

3.34 The assessment of the significance of the permanent residual landscape and visual impacts assumes that proposed mitigation measures will be implemented and that planted vegetation will grow successfully, reducing potential impacts both on the day of opening, and in the future when new vegetation will be deemed to be reaching maturity. The assessment therefore describes impacts at year 1 and at year 10 to give consideration to the difference in impacts arising from the implementation of additional mitigation measures (as the degree of vegetative screening/filtering will increase as vegetation matures).

3.35 Therefore, alongside the assessment, options for mitigation of the identified potential adverse impacts which are predicted to arise from the development were considered, and practical measures agreed to avoid or reduce these. Mitigation measures were incorporated into the design as they were agreed, and the assessment reports the residual impacts of the project taking into account these measures, as detailed in **Section 5** and **Section 6** of this report.

Assessing Significance

3.36 The following sections set out the methodology specific to the type of impact being considered, and describe how the sensitivity or 'nature of the receptor' and the magnitude of change or 'nature of the impact' on that receptor were identified and used to judge the significance of impact. Note that the methodology used for the assessment of landscape and visual impacts, in particular determining sensitivity, magnitude and significance, may differ to a degree from the

generic methodology used for other chapters, as it is required to follow the Guidelines for Landscape and Visual Impact Assessment (Third Edition 2013).

Sensitivity

3.37 The sensitivity of the receptor is a description of the nature of the receptor, described in terms of:

- The susceptibility to the change to (or loss of) features (physical changes), or to change in character of its landscape (perceived changes);
- The value placed on the resource, as described by designation or policy protection, or in terms of judgements regarding issues such as scenic qualities and rarity.

3.38 Sensitivity of the receptor was classified as being high, medium or low on the basis of evaluation against the criteria set out in **Table 3.1**.

Table 3.1 Sensitivity of the receptor: landscape resources

	Criteria tending towards higher or lower sensitivity	
	Higher ⟷	**Lower**
Sensitivity to Change	Vulnerable to change or loss of features that would alter key landscape characteristics. Complex, rugged, irregular landform with strong topographical features and distinctive skylines. Few modern artefacts present, presence of small scale, historic or vernacular settlement. Remote from visible or audible signs of human activity and development. A landscape with unique characteristics . A landscape which may be designated with national policy level protection.	Robust landscape, able to accommodate change or loss of features without altering landscape characteristics. Simple, regular landform without strong topographical features, non-prominent or screened skylines. Presence of contemporary structures e.g. utility, infrastructure or industrial elements. Close to visible or audible signs of human activity and development. Areas or features which may not be designated but may be valued at a community level.

3.39 Changes to views and visual amenity are experienced by people (viewers) at static locations (i.e. viewpoints and settlements) and transitional locations (sequential views from routes).

3.40 The sensitivity of the visual resource was considered in terms of the value attached to a view, as indicated by the number and type of viewers or indicated on maps or tourist information.

3.41 Sensitivity of the receptor was classified as being high, medium or low on the basis of evaluation of the criteria set out in **Table 3.2**.

Table 3.2 Sensitivity of the receptor: visual resources

	Criteria tending towards higher or lower sensitivity	
	Higher ⟷	**Lower**
Sensitivity to Change	High scenic quality Unaffected by overt or intrusive man-made elements Strong inter-visibility with sensitive landscapes Forms an important part of a view from sensitive viewpoints	Low scenic quality View includes overt or intrusive man-made elements Little inter-visibility with adjacent sensitive landscapes or viewpoints
Value	Designated viewpoint advertised on OS maps and in tourist information Location within a designated landscape area	Viewpoints not advertised on OS maps or tourist information
Viewers	Residents, visitors or tourists High numbers of viewers Viewers whose main focus of activity is on their surroundings	Working or travelling viewers Low number of viewers Viewers whose main focus of activity is not their surroundings

Magnitude of Change

3.42 The magnitude of change requires a judgement about the nature of the impact on the receptor. The magnitude of change to the landscape resource relates to:

- The scale of physical and perceived changes. Physical changes were assessed by considering changes to (or loss of) landscape features and the introduction of new landscape features. Perceived changes to landscape were assessed by considering changes to the character of the landscape, including for example the sense of openness or exposure; and
- The geographical extent to which the change would occur.

3.43 The magnitude of change to the visual resource relates to:

- The scale of the changes, including the proportion of the view affected; and
- The geographical extent to which the change would affect views (unique to the viewpoint, or similar visual changes over a wider area using the viewpoint to represent the area).

3.44 The magnitude of change was classified as being high, medium, low or imperceptible, based on evaluation of the criteria set out in **Table 3.3**.

Table 3.3 Magnitude of change to the landscape and visual resource

	Criteria tending towards higher or lower magnitude of change	
	Higher ⟷	**Lower**
Landscape resource	Large changes or extensive loss of key features Considerable change in the landscapes key characteristics	Small changes to key features, little or no loss of features Small change in the landscapes key characteristics
Visual resource	Notable changes in view, which may be visible for a long duration, facing the change, or which may be in stark contrast with the existing view, or obstruction of a substantial part or important elements of views towards the development area. Substantial changes seen from a viewpoint used to represent a large area Substantial changes viewed over a long section of a route Large proportion of the view affected	Limited perceptible changes in views, or visible for a short duration, perhaps at an oblique angle, or which may blend to an extent with the existing view. Changes seen from a unique viewpoint, which is not representative of a wider area Changes viewed over a short section of a route

Significance Criteria

3.45 The EIA Regulations require that the significance of each potential impact is identified. In this assessment, four levels of impact are used: major, moderate, minor and negligible.

3.46 Major and moderate impacts are judged to be significant in accordance with the EIA Regulations. Minor and negligible impacts are judged not to be significant. The level of impact was assigned through professional judgement, considering both the nature of the receptor or resource (sensitivity) and the predicted nature of the impact (magnitude of change) resulting from the development. A higher level of impact was generally attached to higher magnitude changes affecting higher sensitivity resources or receptors.

3.47 The determination of levels of impact requires the application of professional judgement and experience to take on board the many different variables which need to be considered, and which are given different weight according to site-specific and location-specific considerations in every instance. Judgements are made on a case by case basis, in accordance with published guidance.

3.48 The assessment identifies the duration and reversibility of the impacts. Duration in this assessment is defined on a scale of short, medium, and long-term impacts, which are broadly understood to correspond to between zero and five years, five to fifteen years, and more than fifteen years respectively. Short term (temporary) impacts are considered to include construction impacts, and those that can be reversed by mitigation measures. Long term impacts are those that would remain during the operational lifespan of the development. Permanent impacts are also identified where they occur. These include impacts which would remain after the decommissioning of the development and are irreversible.

Direction of Effects

3.49 The direction of effect (positive, negative or neutral) is determined in relation to the degree to which the proposal fits with landscape character or views and the contribution to the landscape and views that the development makes, even if it is in contrast to existing character.

To cover the ‘maximum case’ situation, potential impacts are assumed to be adverse unless otherwise specifically stated in the text.

4 Existing Environment

Introduction

4.1 The baseline environment for the study areas are described in terms of:

- Designated landscapes;
- Landscape character and resources; and
- Visual amenity.

Landscape Baseline

Designated Landscapes

4.2 The North Yorkshire Moors National Park is approximately 3.5km to the south of the Teesside A & B onshore elements. The nature of the intervening topography is such that there is no potential visibility of the development from within the National Park, and no potential impacts upon it. Therefore it is not considered further.

4.3 The North Yorkshire and Cleveland Heritage Coast is located approximately 3.5km to the southeast of the landfall. Heritage Coasts are not statutory designations, although the North Yorkshire and Cleveland Heritage Coast falls in large part within the North York Moors National Park. The national purposes of Heritage Coasts are to:

- "*Conserve, protect and enhance the natural beauty of the coasts, their marine flora and fauna, and their heritage features.*
- *Facilitate and enhance their enjoyment, understanding and appreciation by the public.*
- *Maintain and improve the health of inshore waters affecting Heritage Coasts and their beaches through appropriate environmental management measures.*
- *Take account of the needs of agriculture, forestry and fishing, and of the economic and social needs of the small communities on these coasts.*"[3]

4.4 This area lies outside the converter stations site, landfall and cable route study area and is not considered as part of this assessment. The North Yorkshire and Cleveland Heritage Coast is however considered within **Chapter 20**.

4.5 The location of designated landscapes within the study area is shown on **Figure 4.1**. There are no other national statutory landscape designations or local landscape designations in the vicinity of the study area.

4.6 There are a number of cultural heritage designations within the HVDC cable route and converter stations study area. They include the Eston Hills Historic Landscape (EHHL), as identified in the Redcar and Cleveland Local Development Framework (RCLDF), located to the south of the A714, and three Conservation Areas covering the villages of Wilton, Yearby and Kirkleatham. These are shown on **Figure 4.2**. These areas are noted in the following assessment, but are considered in detail within **Chapter 27** of the ES.

[3] Natural England. Available at: http://www.naturalengland.org.uk/ourwork/conservation/designations/heritagecoasts/default.aspx

Landscape Character and Resources

National Landscape Character Areas

4.7 At the national scale, the Countryside Character of England (Chris Blandford Associates 1996) classifies the English landscape into 159 National Character Areas (NCAs). The NCA areas are shown on **Figure 4.1.**

4.8 The landfall, cable route and converter stations are located within *NCA 23 Tees Lowlands* and the study area is located predominantly within this NCA. This character area comprises a broad, low-lying plain of gently undulating, predominantly arable farmland with wide views to distant hills. The character area is divided to the north and south by the River Tees; and is characterised by the contrast of quiet rural areas and extensive urban and industrial development which is concentrated along the lower reaches of the Tees, the estuary and coast.

4.9 Large scale chemical and oil refining works along the Tees estuary form a distinctive skyline by both day and night, and overhead transmission lines, pylons, motorway corridors and other infrastructure elements are widespread features. Minor valleys and linear strips of open land extend as 'green corridors' from the surrounding rural farmland into the heart of the Teesside conurbation. This can be seen within the study area, where farmland extends from the foot of the Eston Hills to Redcar and Eston and strips of open farmland separate the settlements of New Marske, Marske on the Sea and Redcar.

4.10 Woodland cover is generally sparse, with some local cover along the River Tees corridor and within parkland and managed estates. Kirkleatham and the parkland surrounding the Wilton Estate are examples within the study area. Extensive areas of mudflats, saltmarsh wetlands and dunes are located at the mouth of the River Tees, providing valuable habitats for wildlife and as such, are designated Sites of Special Scientific Interest (SSSI) and wildlife corridors in the RCLDF.

4.11 Part of the study area is also located within the *NCA 25 North Yorkshire Moors and Cleveland Hills*. NCA 25 is an area of upland plateau landscape which is dissected by a series of dales. The plateau comprises extensive areas of heather moorland that create a sense of space, expansiveness and openness. Such areas lie largely outside the study area, although the Eston Hills at the southern fringes of the study area mark a transition to the upland areas of the moors. This landscape is sparsely settled in its interior, with population mainly concentrated within the dales and on the lower-lying landscape fringes. Towards the coast the landscape becomes more distinctive and dramatic, with high cliffs, small coves and bays, coastal towns and fishing villages.

Local Landscape Character Assessment

4.12 The landscape of the study area is described and classified in the *Redcar and Cleveland Landscape Character Assessment* (2006) and the RCBC Local Development Framework Landscape Character SPD (2010). The SPD classifies the landscapes identified in the 2006 landscape character assessment, as either 'sensitive landscapes' (i.e. sensitive to change) or 'restoration landscapes' (i.e. where land would benefit from measures to restore landscape structure and character).

4.13 The Broad Landscape Areas or Landscape Character Tracts and Landscape Character Units (LCUs) located within the study area, as defined by both the 2006 landscape character assessment and 2010 SPD are shown in **Figure 4.3**. The broad landscape areas and the component LCUs, as defined in the *Redcar and Cleveland Landscape Character Assessment,* within the HVDC cable route study area include:

- Redcar Flats Broad Landscape Area, comprising:

- R1: Urbanised Farmland (East of Wilton);
- R2: Lowland Farmland (South of Redcar and Marske);
- R3: Park and Estate Land (Kirkleatham); and
- R6: Coastal Farmland (Redcar to Marske).

- Eston Hills Broad Landscape Area, comprising:

- E1: Upland (Eston Hills / Eston Moor);
- E2: Escarpment (Eston Hills);
- E3: Parkland (Wilton Castle);
- E5: North east Slopes (Eston Hills); and

- E6: South east Slopes (Eston Hills).

4.14 A further LCU has been defined for the purposes of this study:

- Wilton Complex (defined by LUC).

4.15 The sensitivity of the LCUs is described in **Tables 4.1** and **4.2**, based on judgements made using the criteria contained in **Table 3.1** and informed by the evaluations provided within the SPD.

Table 4.1 Landscape character of the Redcar Flats

Redcar Flats	
Key characteristics: • Contained by the escarpment of the Eston Hills to the South and the coast to the north; • Intensive arable cultivation and enlarged fields; • Sparse hedgerow pattern and few landscape features to interrupt the open gently sloping landscape; • Long views, with skyline features taking on particular importance; • Towards the coast, the land has an open character due to maritime exposure however further inland, the open character derives from hedgerow decline and loss, resulting in a weak landscape structure; and • Industry at the Wilton Complex, and the abrupt urban edges of the surrounding settlements, the A174 and railway corridors have a strong local influence on landscape character. Landscape Character Assessment: • The broad landscape area is classified as Restoration Landscape within the Landscape Character SPD (2010), where "*existing features in this open landscape are relatively sparse and their retention is important to 'place' new development…*" (page 20).	
Character Unit R1 Urbanised farmland (East of Wilton)	
Description	Gently sloping, north facing topography located at the foot of the steeply sloping Wilton Woods, comprising pastoral fields and a number of reservoirs with occasional field trees. The area is enclosed by woodland and tree belts, limiting views in and out of the area. The reservoirs are set within engineered landforms and bound by tall fencing. Buildings within the area are small and associated with the reservoirs rather than farm buildings or residential properties. The area is bound to the north by the A174, with tree belts separating the two.
Sensitivity	This landscape is identified as 'Restoration Landscape' in the Landscape Character SPD (2010), indicating a landscape in which the landscape structure is generally weak and diminished. The area contains features of some sensitivity, including tree belts, but overall is considered to be of **low** sensitivity given the modified nature of the reservoirs which occupy much of the area.
Character Unit R6 Coastal Farmland (Redcar to Marske)	
Description	Gently sloping foreshore and low cliff banks backed by large agricultural field. The coastal character is a key feature of this LCU. This landscape character unit covers an area of land located between the Longbeck to Redcar East railway line and the seafront. The landform comprises a gently sloping foreshore and low cliff banks, backed by an essentially flat agricultural field. This landscape is defined by its long beach, sea views and open, coastal character combined with abrupt urban edges to Redcar and Marske and large agricultural fields.

Redcar Flats	
Sensitivity	The coastal edge at this location creates a strong sense of landscape character. It provides a recreational resource, with a number of parking points indicating immediate access to the shore from the A1085. Open views are available across the character area, including from both the A1085 and railway line as a result of flat landform and very limited hedgerow and tree cover within the landscape as a result of maritime exposure. This landscape is identified as a 'sensitive' landscape in the Landscape Character SPD (2010), indicating a landscape in which much landscape structure is present to give high 'strength of character' which is sensitive to change. Whilst the landscape has a distinctive coastal character, the wider industrialised setting of the area to the north and the degraded nature of much of the agricultural land reduces the overall sensitivity of the area. The sensitivity of the landscape unit to this scale of development is therefore considered to be **medium** overall.
Character Unit R2: Lowland Farmland (South of Redcar and Marske)	
Description	This landscape character unit comprises predominantly flat or gently sloping farmland located between the urban areas of Redcar, Marske-by-Sea and New Marske. This landscape is intensively farmed due to the high quality of the agricultural land and this is reflected in the large field sizes located on more undulating farmland that gently rises towards the steep wooded scarp and Wilton Moor in the south. Extensive views are available from within this landscape to the wider area, including the coast although these are locally limited by well-maintained hedgerows bounding roads. In addition, linear tree and scrub vegetation is also associated with Roger Dikes, Cat Flatt Lane and Fishpond Road, offering both wildlife and visual value. This is a largely open landscape resulting in the hard industrial and urban edges, of New Marske in particular, being relatively intrusive in this landscape.
Sensitivity	This landscape is identified as 'Restoration Landscape' in the Landscape Character SPD (2010), indicating a landscape in which the landscape structure is generally weak and diminished. This character unit comprises predominantly intensively farmed, large arable fields separated by a sparse and fragmented hedgerow pattern, with a general absence of hedgerow trees. Although views towards the coast are available, the character of this unit is influenced by the adjacent industrial and urban development. As such, sensitivity of the area is considered to be **low**.
Character Unit R3: Park and Estate Land (Kirkleatham)	
Description	This landscape character unit is a largely flat, open arable farmland with some minor, broad undulations that generally equates to the Kirkleatham village Conservation Area. Kirkleatham village is a small, attractive settlement with a number of historic buildings including Grade 1 Listed alms houses and Sir William Turner's Hospital. Outside the village itself, land use is mixed, with woodland forming a dominant element of the land use and enclosure to a series of open spaces, the larger ones used for recreation. Where the historic landscape and buildings of the village remain intact, the landscape is considered to be of higher sensitivity, reducing in towards the Wilton Complex and Kirkleatham Business Park edges. Kirkleatham Business Park is located just to the north of Kirkleatham village, comprising new prefabricated metal units which fragment the original farmland. The landscape within the vicinity of Kirkleatham Business Park is strongly influenced by the Wilton Complex.

Redcar Flats	
Sensitivity	This landscape character unit largely corresponds to the Kirkleatham Conservation Area, which covers the historic village and surrounding landscape. In this area, considered to be of high quality, the landscape is of high sensitivity. There is also a museum and owl sanctuary located within Kirkleatham, suggesting high recreational value. Sensitivity of the landscape character unit reduces towards the edges adjacent to the Wilton Complex and Kirkleatham Business Park, where the landscape quality diminishes. Overall the sensitivity is considered to be **high**.
Wilton Complex (Converter Stations site is located within this LCU)	
Description	This is a large scale, flat industrial area set out on a grid pattern. Wilton Complex comprises towers, stacks, depots and offices which are separated by roads, hard-standing and mown grass, all of which is contained within security fencing. In places around the perimeter there are wooded bunds, helping to screen views into the plant from the surrounding road network. There are a number of green field sites located around the periphery of the works; and a number of brownfield sites which contain some disused industrial development and concrete hardstanding, with areas of grass, perennial weeds and some regenerating birch.
Sensitivity	The landscape of the Wilton Complex is generally of low landscape quality as a result of the high concentration of industrial buildings. The sensitivity of this landscape unit is considered to be **low**.

Table 4.2 Landscape character of the Eston Hills

Eston Hills	
Key characteristics: • Characterised by a complex of prominent, steep-sided hills which are linked by low saddles and form a parallel series of foothills to the main escarpment of the Cleveland Hills, which lie within the North Yorkshire Moors National Park; • Distinctive areas of open moorland and wooded hill slopes and escarpments; • Views to the south are to the Cleveland Hills; views to the north are over the urban and industrial developments of Teesside and Redcar; Landscape Character Assessment: • The elevated areas of Eston Hills area, including the escarpment to the north and open Eston Moor are classified within the Landscape Character SPD (2010) as Sensitive Landscapes due to the distinctive woodland pattern, landform as well as biodiversity, historical and recreational value. • The lower-lying areas to the south of the hills (outwith the study area) are classified as Restoration Landscapes.	
Character Unit E1 Upland (Eston Hills/Eston Moor)	
Description	A large character area containing dominant landform where scarp slope presents marked contrast to the Tees Lowlands, offering accessible recreational routes to the public and extensive views over a variety of landscapes.
Sensitivity	This is a visually prominent area, widely available from the lower lying valley to the north, forming a visual setting to the Tees lowland. The area is popular for recreation and contains a range of habitats with biodiversity value. The surrounding area to the north consists of heavily industrialised and developed lowlands and therefore the sensitivity of the area to development out-with it is considered to be **medium**.
Character Unit E2 Escarpment (Eston Hills)	
Description	An undulating scarp slope on northern edge of Eston Hills, presenting a prominent landform in sharp contrast to the adjacent lowland; steeper at higher altitudes and becoming more gentle as altitude drops. Land use is varied, including dense deciduous woodland, agricultural fields, rough grassland and amenity space.
Sensitivity	This area is important as a visual backdrop to the lower-lying and highly developed areas to the north. Overall the sensitivity of the area is considered to be **high**.
Character Unit E3 Parkland (Wilton Castle)	
Description	A small landscape character unit with strong character covering small planned estate village with church, castle and wooded parkland located on gently sloping and level land at the foot of the Eston Hills slopes. Much of this unit is designated as a Conservation Area although the A174 is a visual intrusion. The historic estate of Wilton Castle is located to the southwest of the village of Wilton which is used for recreation, including a golf course.
Sensitivity	The area of parkland at Wilton is identified as of particular importance within the Eston Hills broad landscape area, contributing to the distinctive character of the area, created by a combination of wooded hillsides and escarpments. It is popular locally for recreation, including a golf course and numerous Public Rights of Way (ProW).

Eston Hills	
	Overall the sensitivity is considered to be **high**.

Landscape character and resources within the development areas

Landfall and HVDC Cable Route

4.16 Landscape resources and character that may be directly or indirectly affected by the proposed works are described in further detail below, in order to draw out the specific characteristics of the areas through which the cable route passes and their immediate setting. They are organised according to the local LCUs, in sequence from the landfall at Marske Sands through to the proposed converter stations site within the south of the Wilton Complex.

4.17 Landscape resources along the cable route, their immediate settings and surroundings which will be affected by the installation of the buried cable systems and associated construction compounds are identified. Features and designations indicating more sensitive landscapes, including woodland (ancient, semi-natural and replanted), woodland pasture and parkland, and areas identified as sensitive landscapes within the SPD (RCBC 2010) are shown on **Figure 4.4a**. The baseline description and evaluation of landscape resources and character have also been informed by the CPRE Tranquillity Mapping and Lighting data, presented in **Figure 4.5**.

4.18 The overall sensitivity of the landscape resources and landscape character of each section of the HVDC cable route and immediate surroundings are evaluated and stated, based on judgements made using the criteria in **Table 3.1**.

Marske Sands and Redcar Flats Coastal Farmland (LCU R6)

4.19 Marske Sands comprises an intertidal sandy beach backed by low sandy cliff banks and remnant sand dunes. The A1085 follows the line of the coast, offset from the cliff edge by a narrow margin of grass and remnant dunes, and forms a prominent feature by virtue of the movement of cars. The beach is largely visually obscured from the flat agricultural land inland, away from the cliff edges. The beach is accessible from two car parks, at Millclose Howle and Bydale Howle and is heavily used for recreation.

4.20 The landfall is located towards the southern end of the sands, to the edge of Marske, immediately north of Long Beck, a small beck that is culverted at the A1085 and flows into the sea just north of the Bydale car park.

4.21 Long views are available from the cliff banks and the beach to the south towards the headland at Warsett Hill and Huntcliff, where the North York Moors meets the coast. The headland forms the visual focus from this section of the coast, the dramatic high cliffs contrasting with the lower, densely developed coast to the north at Redcar and the mouth of the Tees.

4.22 The beach is an integral part of the character of the landscape within the R6: Coastal Farmland (Redcar to Marske) landscape unit as the low relief between the coast and the adjacent farmland result in the open, coastal character and sea views as being defining characteristics. Although views to Redcar and Marske are obtrusive within this flat landscape, the open character of the landform remains sensitive to further change. The Marske Sands are therefore considered to be of medium sensitivity.

4.23 Inland, the coastal edge is separated from the agricultural hinterland by the A1085, and the traffic movement along this is a prominent visual and audible influence on the surrounding area. The coastal farmland comprises gently sloping agricultural land, with an open character further emphasised the very large scale of the fields and by very limited hedgerow and tree cover.

4.24 Abrupt urban edges of Marske and Redcar enclose the area, softened at the edge of Marske by low vegetation following Long Beck, which are sensitive features within otherwise intensively farmed arable fields. Field boundaries are degraded, with wooden fencing bounding the field and the road in limited sections. Sewage works located immediately adjacent to the proposed cable route to the northwest of Marske-by-the-Sea are largely visually screened and not widely discernible. To the west of Ryehills Farm, the proposed cable route crosses a minor road, connecting Redcar with Marske. At this point, Black's Bridge, the road is slightly elevated as it

crosses over a railway line, allowing views over the surrounding farmland and settlements as well as the coast to the northeast. The railway line is enclosed by embankments and vegetation.

4.25 Overall sensitivity is judged to be **medium**.

Redcar flats: Lowland Farmland South of Redcar and Marske (LCU R2)

4.26 To the south of Black's Bridge, the cable route bisects a flat arable field, bound by tall hedgerows and a narrow track, Cat Flat Lane, which forms a PRoW to the west. The proposed cable route crosses Cat Flatt Lane, crossing a tall, dense hedgerow and continues southwest across an arable field until it reaches the A174, which is elevated slightly above the level of the surrounding landscape. South of the A174 the cable routes crosses agricultural land which becomes increasingly more varied in topography, with the landform becoming more undulating and rising to the south as it approaches the foot of the Eston Hill escarpments. Views are locally shorter where more rolling landform limits views, although the large agricultural fields through which the cable routes passes are mostly large in scale and intensively farmed.

4.27 Generally the structure of hedgerows is stronger in this part of the LCU, often tall with some small hedgerow trees, in contrast with the more exposed coastal farmland. A sparse and fragmented hedgerow pattern does however predominate within the fields immediately south of the A1074. The more intact and denser hedgerows and occasional hedgerow trees are more sensitive features particularly in an area of intensive farming where much of the pattern and structure has been degraded.

4.28 Within the north of the area, the railway line and traffic movement on the A174 are notable features. The A174 is highly visible and prominent from much of the area, which is slightly elevated above the surrounding fields in places and largely unscreened. The margins of the surrounding settlements are characterised by incremental development, including glass houses associated with a plant nursery south of Black's Bridge and allotments north of New Marske. Paddocks and some pastoral fields lie to the south of the area, with young tree belts and groups of trees contributing to a stronger structure around Longbeck Lane and the southern extents of Yearby Bank.

4.29 The level of development within the wider area is such that the urban edges of Redcar to the north, Marske-by-the-Sea to the east, and New Marske to the south are highly visible, and the stacks and chimneys of the Wilton Complex are a constant feature of the skyline to the northwest. The Eston Hills form a distinctive backdrop to views inland, whilst to the northeast the sea is frequently visible, including the large container ships and tankers anchored at the mouth of the Tees.

4.30 The area forms a recreational resource as an area of open green space between settlements. A number of PRoWs converge on Cat Flatt Lane and to the west of Yearby, and several permissible bridleways cross the area. The strong network of paths link between the settlements to the hills.

4.31 Due to the industrialised context and the urban fringe character of much of the area along this section of the route, the sensitivity overall is considered to be **medium**.

Wilton Complex (LCU W1)

4.32 The final sections of the proposed cable route are located within the Wilton Complex. This landscape is considered to be of **low** sensitivity overall as a result of the prevalent large scale industrial landscape comprising oil refinery and chemical works.

Converter Stations Site

4.33 The proposed converter stations site lies within the Wilton Complex landscape unit, as defined by LUC (**Table 4.1**). The Wilton Complex is a former chemical works and currently zoned for industrial development. The complex consists of a mixture of operational heavy and light industrial works as well as derelict brownfield and arable land.

4.34 The site covers an area of approximately 9ha and comprises a flat agricultural field, bound by access roads within the Wilton Complex to the north and east and to the south by smaller arable fields. A dense shelterbelt lies to the east, separating the site from the access road and the Wilton Centre beyond.

4.35 The smaller arable fields to the south are enclosed to the south, east and west by deciduous tree belts on high bunds of up to 10m in height. The bunds and tree belts serve in part to screen views into the Wilton Complex from the small settlement of Lazenby, located to the southwest, and from the A174.

4.36 The western boundary of the site is marked by an existing field boundary, open to the southern end and marked by hedgerow at the northern end. The neighbouring land to the west comprises arable fields and scrub interspersed with wide shelter belts and bunds.

4.37 Overall the sensitivity of the landscape character and resources of the site and immediate surroundings is considered to be **low**.

HVAC Cable Route and Modification Works at the Existing NGET Substation at Lackenby

4.38 The cable route extends across the LCUs of the Wilton Complex (LCU W1) and the settlement edge of Lackenby, within which the existing NGET substation at Lackenby is located. Features and designations indicating more sensitive landscape resources, including woodland (ancient, semi-natural and replanted), woodland pasture and parkland, and areas identified as sensitive landscapes within the SPD (RCBC, 2010) are shown on **Figure 4.4b**.

4.39 The landscape through which the cable route passes is flat, largely comprising intensely managed agricultural farmland, with scrub and woodland. The cable route runs to the north of a paved track within the Wilton Complex for a short section to the northwest of the converter stations site. The track is unbound with no hedgerows. The cable route crosses the track where it bends to the southwest and continues to run parallel to the north of the track. The character of the area is strongly influenced by the presence of large buildings and tall structures within the Wilton Complex to the north. An overhead power line crosses the large fields to the north of the track.

4.40 More sensitive features present along the cable route include tree belts either side of the A1053, which serve to screen views of the existing NGET substation at Lackenby and the Wilton Complex from the road, and hedgerows and areas of woodland to the north of Lazenby, which screen views of the Wilton Complex from the settlement. The landscape surrounding the existing NGET substation at Lackenby through which the cable route passes is of **low** sensitivity overall.

Visual Baseline

HVDC Cable Route Study Area

4.41 In order to assess short term visual impacts during the construction phase, potential visual receptors along the length of the buried cable route within the study area were identified. These are listed in **Table 4.3** and their locations are shown on **Figure 4.6**. The sensitivity of the receptors is also listed, based on the criteria set out in **Table 3.2**.

Table 4.3 Landfall and HVDC cable route visual receptors

No.	Location	Receptor type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description
1	Millclose Howle Car Park	R, T Medium	Public car park located between the Marske Sands foreshore and the A1085. This receptor is also a proxy for travelling receptors along the A1085. The location is considered to be of medium sensitivity, as although the beach is a popular local recreational destination, where there are open marine views, the close proximity of Redcar to the northwest, and the industrialised context of the views to the north and inland reduces the overall sensitivity.
2	Bydale Howle Car Park	R, T Medium	Public car park located between the Marske Sands foreshore and the A1085, to the south of the Bydale Howle carp park. This receptor is also a proxy for travelling receptors along the A1085. The location is considered to be of medium sensitivity, as although the beach is a popular local recreational destination, where there are open marine views, the industrialised context of the views to the north and inland reduces the overall sensitivity.
3	North East Corner of the Marske-by-the-Sea allotments	R Medium	Recreational receptor located at the northeast of allotment gardens on the northern edge of Marske-by-the-Sea. The location is considered to be of medium sensitivity as it is frequented by recreational and travelling viewers with a moderate interest in their environment at a recreational facility when the main focus of activity is not on the surroundings.
4	Bydales School	H, R Medium	Newly constructed secondary school located on the northern edge of Marske-by-the-Sea, adjacent to the A1085. The location is considered to be of medium sensitivity as it is frequented by viewers at the school with a moderate interest in their environment.
5	Oak Road	H High	Residential receptor located on cul-de-sac on the eastern edge of Redcar. Houses oriented away from existing residential development, towards the coast. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
6	Mackinlay Park	R, T Medium	Recreational receptor located at park which serves as Redcar Rugby Union Football Club. This receptor is also a proxy for PRoW (bridleway) located adjacent to the park. The location is considered to be of medium sensitivity as it is used locally for recreation by viewers that are likely to have a moderate interest in their environment.
7	Beardmore Avenue	R High	Residential receptor located at western edge of housing development in west Marske-by-the-Sea, including allotment plots. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
8	Ryehills Farm	H, T	Two storey farmhouse and associated stone outbuildings located to the west of Marske-by-the-Sea. Located adjacent to the Redcar Road

No.	Location	Receptor type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description
		High	'B' road. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
9	Marked path adjacent to the Ings	H, R, T High	Footpath marked on OS mapping running through park at the centre of The Ings housing development to the east of Redcar. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities as well as being used locally for recreation.
10	PRoW near Mickle Dales (Cat Flatt Lane)	R, T Medium	Residential and travelling receptor located on PRoW on Cat Flatt Lane, amid agricultural fields between Marske-by-the-Sea and Redcar. The location is considered to be of medium sensitivity as it is used locally for recreation by viewers that are likely to have a moderate interest in their environment.
11	Longbeck Station	T Low	Railway station located near level crossing over Longbeck Road on the southern edge of Marske-by-the-Sea. The location that is considered to be of low sensitivity as the travelling viewers at the train station or on trains passing through it are likely to have a passing interest in their surroundings.
12	Junction of A174 and PRoW at Tunstall Gdns.	H, R, T High	Receptor located on A174 at boundary with PRoW that runs from Mickle Dales to Grewgrass Farm. This receptor is also a proxy for views from Tunstall Gardens and the surrounding residential development to the southeast of Redcar. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities as well as being used locally for recreation.
13	Grewgrass Farm	H, T High	Two storey farmhouse set within well-established gardens, together with associated outbuildings located on both sides of Grewgrass Lane, a 'B' road running south from the A174, south of Redcar. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
14	New Marske Methodist Church and St. Thomas' Church	H, R High	Representing properties and two nearly adjacent churches located on elevated land to the northeast of New Marske, as well as allotments located here. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities as well as being used locally for recreation.
15	Sparrow Park Farm	H, T High	Two storey traditional farmhouse and associated outbuildings located on Longbeck Lane, a 'B' road on the northern edge of New Marske. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.

No.	Location	Receptor type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description
16	Junction of Lindrick Road and Longbeck Lane and Fell Briggs Farm	H, T High	Residential and travelling receptor representative of views from dwellings located on the northern edge of New Marske, which afford open views across the landscape to the north. Also a proxy for Longbeck Lane, 'B' road bounding New Marske to the north. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
17	The Filter House and Thrushwood Farm	H, T High	New build farmhouse set within complex of working farm buildings, set on either side of unclassified road connecting Grewgrass Lane in the east to the B1269 in the west. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
18	Errington Wood	R Medium	Representing recreational receptors at the picnic area, car park and play area at the northern edge of Errington Wood. Located in an open area of the woodland, on the hill slope to the south of New Marske, long views are available to the north over Teesside, including Redcar, Marske and the farmland stretching between the settlements and the Wilton Complex.
19	Junction of Larkswood Road, Plantation Road and A174	H, T High	Representative of views from footpath connecting housing on Larkswood Road / Plantation Road with the A174. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
20	Turners Arms Farm	H, R, T High	Substantial three storey brick farmhouse located in elevated position, on the east side of Fishponds Road (B1269). Extensive outbuildings are located to the east of the farmhouse. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
21	Conservation Area village of Yearby	H, T High	Residential receptors at small village of Yearby, located to the west of Fishponds Road (B1269) which is designated as a Conservation Area in the Redcar and Cleveland Local Development Framework (2007). The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
22	Kirkleatham Old Hall Museum and Owl Sanctuary	H, R High	Residential receptors at village of Kirkleatham, located to the southwest of Redcar, between the A1042 and A174. This village is designated as a Conservation Area in the Redcar and Cleveland Local Development Framework (2007). The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities as well as being a popular recreational destination locally.

Converter Stations Study Area

4.42 The area immediately north of the site is dominated by the extensive industrial works of the Wilton Complex, which extend some distance to the north, across the River Tees to Seal Sands. Views from the wider landscape to the north will be constrained by this industrial development, and views to the north will therefore be available only from within the Wilton Complex. Given that access to the Wilton Complex is limited, it is not considered likely that there will be any recreational or other receptors at this location to the north or east.

4.43 From the west, views towards the site are available from a network of farm access tracks, some of which are used informally for recreation. The bunds and tree belts located to the west help to screen views into the southern part of the Wilton Complex. Glimpsed views towards the site are available from the A1053, where views are possible across the bunds and tree belts to the northwest of Lazenby.

4.44 From the south, views from the A174 towards the site are likely to be mostly screened by vegetation during the summer months, with greater visibility available in winter. An embankment located immediately to the north of the road is likely to provide further screening of views to the site from ground level.

4.45 The landform rises in a distinctive scarp form (Wilton Wood, Castle Bank, Lazenby Bank etc.), approximately 200m in height to the south of the study area. To the south of this scarp any visibility towards the site is screened by the existing landform. This landscape to the south of the scarp is both locally undulating and densely wooded which provides some screening of views to the wider landscape, however glimpsed views are available from a number of PRoWs located within this area and from Eston Nab, a locally prominent outcrop and viewpoint.

Residential Receptors

4.46 Views towards the Wilton Complex and the site are available from localised areas at the northeast edge of Lazenby. Views from ground level are intermittently screened by houses and garden vegetation, and by the bunds and woodland planting to the north and east. Views to the northeast towards the site are available from some upper storey windows where intervening buildings and the bunds allow. Views are also available from gardens bounding the northern and north-eastern edge of the settlement, screened to varying degrees by the bunds and woodland planting to the north and east. These views are represented by **Viewpoint 1: Lazenby Northern Edge**.

4.47 From within the larger part of Lazenby, views from ground level are screened by the topography of the intervening bunds and tree planting between the village and the site, which also screen views towards the Wilton Complex. Some views may be available towards the site from upper storey windows of properties within the northern and eastern parts of the settlement.

4.48 A number of individual properties are located within approximately 1km of the converter station(s): Wilton Castle, converted c.19th castle located approximately 500m to the southeast; North Lodge, two storey Victorian cottage located immediately to the south of the A174; Bank Top Farm, located on elevated land to the south of the village of Wilton; and South Lackenby, a farm complex located immediately to the south of the existing NGET substation at Lackenby. The ZTV indicates that visibility from these properties, with the exception of Wilton Castle, will be very limited due to the wooded nature of their landscape setting, and are therefore not considered further. Views are available to the north from localised parts of the land surrounding Wilton Castle, represented by **Viewpoint 3: Wilton Castle**.

4.49 Settlements within the surrounding landscape include Wilton, Lazenby, Lackenby, Kirkleatham and Yearby. Wilton, Kirkleatham and Yearby are designated as Conservation Areas. Wilton and Kirkleatham are set within well-established landscape settings, with very limited views to the either the proposed cable route or converter stations. The northern extent of Yearby is more open in nature, but the ZTV indicates that there is no potential visibility of the converter stations. Potential visibility is limited from within Lackenby, although some views towards the site are available from the eastern edge of the settlement, which are represented by **Viewpoint 6: South Lackenby**.

4.50 There are five towns located within the wider study area: New Marske, Marske-by-the-Sea, Redcar, Eston and Guisborough. There is no or very limited potential visibility from these areas due to screening by woodland, landform and buildings surrounding the site and therefore they are not considered further.

Recreational Receptors

4.51 Close range views towards the site are available from informal recreational areas to the north of Lazenby, from along Pasture Lane. The views are intermittently screened by vegetation along the lane and bunds to the east. These views are represented by **Viewpoint 2: Pasture Lane, Lazenby**.

4.52 Elevated vantage points, accessible from a number of PRoWs, are located on the northern ridge of the Eston Hills, affording wide views over the Tees Valley below. Views are represented by **Viewpoint 3: Wilton Castle** and **Viewpoint 5: Eston Nab**.

Travelling Receptors

4.53 The A174 passes to the south of the site and the A1053, Greystone Road to the west. The ZTV indicates very limited potential visibility from the A1053 due to screening by existing woodland planting, bunding and road-side embankments, and potential visibility from some short sections of the A174 immediately to the south of the site. The ZTV also indicates that visibility from the A1085 to the north of the Wilton Complex will be very limited and therefore this road is not considered further.

4.54 The Saltburn to Redcar railway line is located approximately 3km to both the north and east of the converter stations. At this distance and due to much of the railway line being enclosed by cuttings and vegetation, views are unlikely to be available of the converter stations. This is therefore not considered further in this assessment.

Representative Viewpoints

4.55 Viewpoints around the study area were selected as described in **Section 3**. Seven viewpoints were selected, in consultation with RCBC and Natural England, to represent important views from key sensitive receptors, public places and recreational areas or paths. Viewpoints were chosen to reflect a range of locations at varying distances and directions from the converter stations, where the presence of hedgerows, trees and woodland would not restrict views. Their locations are shown in **Figure 4.7**. A summary of the reason for selection and any relevant designations is provided in **Table 4.4**. Existing views from the representative viewpoints are described, visual receptors identified and a judgement about sensitivity of each viewpoint made according to the criteria set out in **Table 3.2**.

Table 4.4 Converter stations assessment viewpoints

	Location	OS grid reference	Distance from converter stations (nearest point)	Reason for selection	Receptor type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Description of existing view
1	Lazenby, northern edge	NZ 57505 19152	0.2km	Representative of residential receptors located at the northern edge of Lazenby, at closest point to the converter stations site.	H High	To the northeast, views are available through interlocking ends of two grassed bunds, through which an unsurfaced track runs, bound either side by post and wire fencing. A large, flat agricultural field is visible beyond this, with a large block of mixed woodland containing views further east. To the north of the woodland (left in the view) several large stacks, cooling towers and industrial structures are visible above the bund, forming a complex skyline in this direction. To the southeast, the view is short, contained by a grassed bund that rises up to approximately 4m, with semi-mature woodland extending along the top of the bund. To the north views are also short, across a small strip of field to a long bund topped with semi-mature woodland.
2	Pasture Lane, Lazenby	NZ 57153 20133	0.5km	Representative of recreational receptors on recreational path.	R Medium	To the east, views extend along an unsurfaced track in the foreground a large area of flat, open grassland, partly screened by the slope of a grassed bund and enclosed by post and wire fencing. Beyond this, the Wilton Complex is visible across the skyline, with palisade fencing and intermittent hedgerows marking the edge of the complex. An extensive area of large sheds, stacks and cooling towers is visible, forming a busy and highly industrialised section of the view. To the southeast views are contained by a large grassed bund, with woodland extending across the top. To the south, framed views are available towards the northern edge of Lazenby. To the north, views look along a dirt track through scrub vegetation. The ground rises up to the top of a bund in this direction, covered with dense vegetation and semi-mature trees that contain the view.

3	Wilton Castle, Wilton	NZ 58148 19679	0.7km	Representative of views from residential and recreational receptors at Wilton Castle and golf course.	H, R High	The main direction of view is to the north, across a foreground of a terraced lawn that drops down to the access road. A golf course is visible beyond, across which are scattered trees. The golf course is contained by broad-leaf woodland, above which the skyline is dominated by tall chimney stacks, cooling towers and industrial buildings. The view is framed by a tall hedge, mature woodland and large ornamental shrubs that form a dense thicket either side of the lawn.
4	Lazenby Bank	NZ 57515 19150	1.1km	Representative of recreational receptors on PRoW on Lazenby Bank.	R Medium	The view looks through low scrub and trees bounding a PRoW at the edge of the Wilton Golf Course. To the north, the ground slopes away towards the golf course, comprising green amenity grass and evenly spaced young trees, to a dense strip of woodland. Above the woodland the roofs and upper part of houses within Lazenby are visible, with a narrow strip of open agricultural land that separate the settlement from the edge of the Wilton Complex. The large buildings, stacks and cooling towers within the Wilton Complex and further structure beyond at Teesport, dominate the skyline, which is complex and highly industrialised.
5	A1042, southwest of Kirkleatham	NZ 58997 21415	1.5km	Representative of views from travelling receptors on the A174 and Mains Dike Bridge roundabout.	T, R Medium	To the southwest, views look along a wide access track through a medium size, flat agricultural field. A gappy hedgerow bounds the field in the foreground and the edge of the Wilton Complex is marked out by a thin strip of trees, containing broad-leafed deciduous trees and coniferous trees. These filter views into the complex, although tall cooling towers and shed buildings are visible through the line of trees. Lampposts and signage at the entrance of the Wilton Complex is visible beyond the edge of the field further to the south. Views to the south and southeast are long, directed over flat to gently rolling agricultural fields, to the Eston Hills on the skyline in the distance.
6	South Lakenby	NZ 56472 18882	1.8km	Representative of views from PRoW and residential receptors at the south-eastern extents of Eston, near	H, T, R High	The view looks across a gently sloping large, open field to a row of houses at South Lackenby. A line of pylons passes overhead to the northeast and a further line runs parallel to this, terminating at the end of the field. A series of gently rolling fields interspersed with blocks of woodland extend across the middle distance, a foreground

				south Lackenby.		to the vast industrial landscape visible beyond, which extends across a wide portion of the skyline to the northeast. To the south, views are available to the wooded slopes of Lazenby Bank and the distinctive skyline formed by the Eston Hills.
7	Eston Nab	NZ 56878 18410	2.0km	Representative of recreational receptors at viewpoint.	R High	Panoramic views overlooking Teesside are available to the north from this location extending to the open sea to the northeast. In the middle distance, birch woodland on the steep escarpment gives way to gently undulating fields bound by tall hedgerows and interspersed with blocks of woodland at the foot of the escarpment. The Wilton Golf Course is visible to the east. The A1053 and A174, fringed with trees and small reservoirs at the south-western edge of Lazenby are visible. Parcels of agricultural land with regular blocks of woodland and scrub separate Lazenby from the edge of the Wilton Complex. The Wilton Complex and Teesport beyond form a large expanse of industrial works, with extensive areas of hard standing, large buildings stacks and chimneys. In the distance there is a transition to lower, smaller scale but dense development at Redcar at the coastal edge. Within the inshore waters in this direction, large scale turbines are visible, breaking across the flat horizon.

HVAC Cable Route and Modification Works at the Existing NEGT Substation at Lackenby

4.56 In order to assess short term visual impacts during the construction phase, potential visual receptors along the length of the HVAC buried cable and enabling work to the existing NGET substation at Lackenby were identified. These are listed in **Table 4.5** and their locations are shown on **Figure 4.6**. The sensitivity of the receptors is also listed, based on the criteria set out in **Table 3.2**.

Table 4.5 HVAC cable route and modification works at the existing NGET Substation at Lackenby visual receptors

	Location	Receptor type and sensitivity (H: Residential, R: Recreational, T: Travelling)	Reason for selection
24	Pasture Lane, Lazenby	R Medium	Representative of recreational receptors on recreational path to the north of Lazenby. The location is considered to be of medium sensitivity as it is used locally for recreation by viewers that are likely to have a moderate interest in their environment.
25	A1053 Greystone Road	T Low	Representative of travelling receptors on Greystone Road. The location is considered to be of low sensitivity as the travelling viewers are likely to have a limited, passing interest in their surroundings.
26	Lackenby Lane PRoW	R Medium	Representative of recreational receptors using the PRoW to the northwest of the existing NGET substation at Lackenby that links South Lackenby with Grangetown. The location is considered to be of medium sensitivity as it is used locally for recreation by viewers that are likely to have a moderate interest in their environment.
27	Crow Lane, Lackenby	H High	Representative of views from a cluster of properties on Crow Lane, including Old Hall Farm and High Farm, to the southeast of the existing NGET substation at Lackenby. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
28	Wilton Way	H High	Representative of properties at the eastern edge of Wale Hill, east of Eston. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.
29	South Lackenby	H, T High	Representative of views from properties at South Lackenby and travelling receptors on the B1380. The location is considered to be of high sensitivity as a residential property, frequented by viewers with proprietary interest and prolonged viewing opportunities.

5 Assessment of Impacts, Worst Case Definition

Introduction

5.1 This section establishes the 'worst case' (maximum impact) scenarios upon which the subsequent assessment is based. For this assessment this involves both a consideration of the construction scenarios (i.e. the manner in which Dogger Bank Teesside A & B will be built), as well as the particular design parameters of each (such as the maximum construction footprint at the landfall) that define the Rochdale Envelope. Details of the EIA process and a description of the Rochdale Envelope are provided in **Chapter 4 EIA Process** of the ES.

5.2 Details of the range of development options are provided within **Chapter 5** of the ES. Taking these options into consideration, the 'realistic worse case' scenarios for the purposes of the landscape and visual impact assessment in are set out **Table 5.1**.

5.3 Only those design parameters with the potential to influence the level of impact are identified. Therefore, if the design parameter is not described, it is not considered to have a material bearing on the outcome of the assessment.

5.4 The realistic worst case scenarios identified here are also applied to the Cumulative Impact Assessment (CIA) which is presented in **Section 10** of this report. When the worst case scenarios for the project in isolation do not result in the worst case for cumulative impacts, this is addressed within the cumulative assessment (see **Section 10** of this report) and summarised in **Chapter 32 Cumulative Impact Assessment**.

Construction Phasing Scenarios

5.5 As detailed in **Chapter 5** of the ES, a Rochdale Envelope approach has been adopted for the EIA. Four key principles, relating to how the project will be built, form the basis of the Rochdale Envelope:

- The two projects may be constructed at the same time, or at different times;
- If built at different times, either project could be built first;
- If built at different times, the duration of the gap between the end of the first project to be built, and the start of the second project to be built may vary from overlapping, to up to five years apart; and
- Partial installation of elements of the second project may be completed during the construction of the first project, e.g. through the use of ducts to provide conduits for a later cable installation.

5.6 To determine the worst case for a particular receptor, two types of impact may have the potential to cause a maximum level of impact on a given receptor:

- Maximum duration of impacts; and
- Maximum peak (i.e. intensity of impacts at any one time).

5.7 The scenarios resulting in both the maximum duration of impacts, and the maximum peak or intensity of impacts are assessed for each receptor. This ensures that the Rochdale Envelope which is assessed covers all the construction phasing scenarios outlined in **Chapter 5**.

5.8 Furthermore, the option to construct each project in isolation is also considered ('Build A in isolation' and 'Build B in isolation'), enabling the assessment to identify any differences between the two projects.

5.9 The construction scenarios considered within the assessment of the landscape and visual impacts are therefore:

- **Construction Scenario I**: Build Teesside A or Teesside B in isolation;
- **Construction Scenario II**: Build Teesside A & B concurrently (i.e. at the same time) - gives rise to the worst 'peak' impact and maximum sized working footprint; and
- **Construction Scenario III:** Build Teesside A & B sequentially (one after the other, but with a gap) - i.e. build A, gap of up five years, then build B - which provides the worst 'duration' of impact.

5.10 The maximum onshore construction duration for each project is three years, and this forms a window within which all onshore construction activities will be completed once any part of the onshore construction commences. Onshore construction activities (landfall, HVDC cable route, HVAC cable route and the converter station) may occur at any point within this window of time. There may be a gap of up to 5 years between each project.

5.11 The construction methodology for the installation of the landfall, HVDC and HVAC cable sections is mainly open cut trenching (using a direct buried technique or ducts) and HDD (as described in **Chapter 5** of the ES). During the construction period there will be times when activities in certain areas are more intense, and periods between these when little or nothing is happening (as works in areas are completed and the land has been restored, or work is yet to be started in a particular area). As such, both the duration and peak intensity of activities in each area will vary throughout the construction period. The timescales will also depend upon the phasing and the number of working fronts. The number of working fronts could be up to a maximum of 5 for a single project and up to 10 if both projects are installed concurrently. The maximum 'peak impacts' assessed therefore assumes multiple working fronts, where both projects are installed concurrently, and by separate contractors.

5.12 Construction of the second project must start within seven years of consent. Taking a precautionary stance in terms of maximum duration of impacts, and because the longest gap between construction periods may be up to five years a maximum construction period for the two projects of up to ten years is assessed, and forms the basis of Scenario III. As such, these construction-related temporary impacts are all considered to be of medium rather than short term.

5.13 The sequential scenario with conduits is not considered to be materially different from Scenario III above, and as such is not considered separately.

5.14 Within the subsequent impact assessment a single narrative is provided that discusses each of these scenarios. Differences between the scenarios are then quantified within summary tables following each discussion.

5.15 Realistic worst case construction phasing scenarios assumed for the LVIA are summarised in **Table 5.1**.

Operating Scenarios

5.16 The operating scenarios which form the basis of the Rochdale Envelope are detailed in **Chapter 5** of the ES. The worst case for a particular receptor, i.e. which will result in the maximum level of impact on a given receptor during operation, will derive from the maximum extent or size of the converter stations (i.e. dimensions of the foot print and height of structures). The worst case operating scenario is therefore based on both Dogger Bank Teesside A and Dogger Bank Teesside B operating together.

5.17 In order to ensure that the Rochdale Envelope which is assessed covers all the operating scenarios outlined in **Chapter 5**, one additional scenario is considered, 'Dogger Bank Teesside A in isolation' or 'Dogger Bank Teesside B in isolation'. By assessing these scenarios it enables this report to identify differences between a single project in isolation and Dogger Bank Teesside A & B combined.

5.18 The two scenarios assessed are therefore as follows:

- **Operating Scenario I:** Dogger Bank Teesside A or Dogger Bank Teesside B operating in isolation; and
- **Operating Scenario II:** Dogger Bank Teesside A & B, both operating together.

5.19 Realistic worst case operating scenarios assumed for the LVIA are summarised in **Table 5.1**.

Decommissioning Scenarios

5.20 **Chapter 5** provides details of the decommissioning scenarios for Dogger Bank Teesside A & B. Exact decommissioning arrangements will be detailed in a Decommissioning Plan (which will be drawn up and agreed with DECC prior to construction), however for the purpose of this assessment it is assumed that decommissioning could be conducted separately, or at the same time.

Summary

Table 5.1 Realistic worst case scenarios assessed

Impact	Realistic worst case scenario	Rationale
Construction Scenarios		
Landscape and visual receptors	***Construction Scenario I*** Single project: • Maximum construction period of cable route (HVDC cable system): 24 months; • Duration of landfall works up to 24 weeks, of which the maximum construction duration for the joint bay construction (HDD works inland of the landfall) will be 16 weeks; • Maximum construction period of converter station: 36 months; • Maximum construction period of cable route (HVAC cable system): 18 months; • Maximum working fronts: 5 (4 HVDC + 1 HVAC); • Maximum number of temporary construction compounds present within the HVDC cable working width: 1 primary, 2 intermediate, 13 HDD compounds; and • Maximum number of temporary construction compounds present within the HVAC cable working width: 1 intermediate.	Maximum values provided within the Project Details.
Landscape and visual receptors	***Construction Scenario II*** Both projects built concurrently (at the same time) but separately: • Maximum construction period of cable route (HVDC cable system): 24 months; • Duration of landfall works up to 38 weeks, of which the maximum construction duration for the joint bay construction (HDD works inland of the landfall) will be 24 weeks; • Maximum construction period of converter stations: 36 months; • Maximum construction period of cable route (HVAC cable system): 18 months; • Maximum working fronts: 10 (8HVDC + 2 HVAC); • Maximum number of temporary construction compounds present within the HVDC cable working width: 2 primary, 4 intermediate, 13 HDD compounds; and • Maximum number of temporary construction compounds present within the HVAC cable working width: 2 intermediate.	Maximum values provided within the Project Details.

Impact	Realistic worst case scenario	Rationale
Landscape and visual receptors	***Construction Scenario III*** Projects built sequentially (one after the other, with a gap of up to five years): • Maximum construction period of cable route (HVDC cable system): 24 months + 24 months; • Duration of landfall works up to 24 weeks + 24 weeks, of which the maximum construction duration for the joint bay construction (HDD works inland of the landfall) will be 16 weeks + 16 weeks; • Maximum construction period of converter stations: 36 months + 36 months with up to five years gap between construction phases (up to ten years total); • Maximum construction period of cable route (HVAC cable system): 18 months + 18 months; • Maximum working fronts: 5 + 5; • Maximum number of temporary construction compounds present within the HVDC cable working width: 1 + 1 primary and 2 + 2 intermediate; • Maximum number of temporary compounds present within the HVAC cable working width: 1 + 1 intermediate.	Maximum Values provided within the Project Details.
Operating Scenarios		
Landscape and visual receptors	***Operating Scenario I*** Single project: • Presence of a converter station, comprising a converter hall (maximum dimensions 110m long x 75m wide x 20m high), a switch yard (AC yard), up to six lightning rods (maximum height 30m from ground level); • Presence of access road for maintenance.	Maximum values provided within the Project Details.
Landscape and visual receptors	***Operating Scenario II*** Both projects in operation at the same time: • Presence of two converter stations, comprising two converter halls (maximum dimensions 110m long x 75m wide x 20m high), two switch yards (AC yards), up to twelve lightning rods (maximum height 30m from ground level); • Presence of access road for maintenance.	Maximum values provided within the Project Details.

6 Assessment of Impacts During Construction

Introduction

6.1 This section details the potential impacts arising from the construction of the onshore components of Dogger Bank Teesside A & B, agreed mitigation measures and residual impacts.

6.2 Mitigation measures below include those which are embedded (i.e. included as part of the site selection and design development process) and additional measures which will be adopted to further reduce impacts following the siting and design process. An initial site selection process was undertaken, in which potential impacts were reconsidered as part of both the site selection process and project design development. This is detailed in **Chapter 6 Assessment of Alternatives** and **Chapter 5** of the ES.

6.3 Sources of potential impacts are identified below, followed by a summary of mitigation measures. The assessment of residual impacts is then presented, assuming the implementation of the mitigation measures.

Sources of Impacts

6.4 Sources of key landscape and visual impacts arising during the construction phase of the landfall, HVDC and HVAC cable routes, and NGET modification work at the existing NGET substation at Lackenby may include the following:

- Establishment of a temporary cofferdam within the intertidal area, including works on the beach;
- Establishment of a construction working area, including two temporary haul roads and site access points along the length of the HVDC cable route, of up to 18m wide for a single project and 36m wide for both projects built concurrently;
- Establishment of a construction working area, including two temporary haul roads and site access points along the length of the HVAC cable route, of up to 20m wide for a single project and 39m wide for both projects built concurrently;
- Excavation of two cable trenches including clearance of vegetation within the construction working route, creation of gaps in hedgerows and tree belts, presence of a 6.5m to 8m wide strip of top soil storage (per cable trench) and open trenches in the landscape;
- Laying of cables into the ground involving cranes for delivery of cable drums to site, presence of cranes to off-load cables into the trench;
- Presence of temporary construction compounds within or adjacent to the cable route at multiple locations, as indicated on **Figures 4.1**. The compounds will be fenced and subject to overnight security, and will store plant, equipment and other materials;
- Establishment of temporary working areas at each major and minor HDD site;
- Installation and movement of construction vehicles and machinery including but not limited to HGV, special load transport, excavators, winches, drilling plant, cranes, jacks, and bowsers along construction traffic routes and along the working width;
- Storage of materials within the working width of the cable route;
- On site signage and lighting; and
- Post-construction, removal of the temporary compounds and haul roads, and restoration of hard standing and access roads.

6.5 The process of open cut trenching will be carried out progressively section by section, and will involve temporary disturbance primarily to agricultural land, the presence of primary and intermediate construction compounds, open trenches, stock piles of excavated material, fencing and the movement of vehicles and machinery.

6.6 Sources of key landscape and visual impacts arising during the construction phase of the converter stations may result from the following:

- Preparation of the site, temporary compound areas and shared access road, including removal of vegetation, soil stripping, excavation and levelling works, and storage of excavated materials;
- Site compounds including offices, stores, delivery and off-loading areas, welfare facilities, parking areas, security accommodation, wheel wash, fencing and signage;
- Installation and/or movement of construction vehicles and machinery including but not limited to HGV, special load transport, excavators, winches, cranes, jacks, and bowsers;
- On site signage, steel mesh and panel security fencing system and lighting; and
- Post-construction, removal of temporary compound and haul roads and restoration of the landscape.

6.7 Some changes resulting from construction are in themselves short-term, e.g. visibility of equipment/machinery, while some changes resulting from construction are longer term, e.g. loss of vegetation. The long term landscape and visual impacts resulting from the constructed converter station(s) (i.e. the buildings and structures themselves) are assessed as part of the operational impacts in **Section 7** of this report.

Proposed Mitigation

6.8 This section details the siting and design considerations and agreed mitigation measures in relation to the potential sources of impacts during the construction phase. These include those which are embedded and restoration measures which will be adopted to minimise long term landscape and visual impacts, as defined in **Section 3** of this report**.**

Embedded Mitigation

Converter stations, landfall and cable routes

6.9 In order to minimise negative impacts on the landscape and views, a number of siting and design objectives were considered. These sought to reduce significant impacts through alterations to the cable route, the broad-scale and detailed siting of the two converter stations, alongside the implementation of appropriate environmental management practices during the construction phase.

6.10 The guidance in the following documents was followed as far as possible in the site selection and development process:

- NGC (1993) The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines;
- NGC The Horlock Rules: NGC Substations and the Environment: Guidelines on Siting and Design;
- National Joint Utilities Group (NJUG) (2007) NJUG Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees, Issue 2; and
- British Standards Institution, BS 5837: 2012 Trees in Relation to Design, Demolition and Construction - Recommendations.

6.11 It was decided that a single cable route containing two co-located cable systems would be taken forward in order to reduce landscape and visual impacts and other environmental impacts, rather than separate cable systems which could potentially have had more extensive impacts.

6.12 A high level design decision was made by Forewind to seek consent for buried cables for both the HVDC and HVAC sections of the cable route, rather than overhead lines which will considerably reduce the potential for landscape and visual impacts.

6.13 The decision was made to use HDD technique at the landfall and to bury the joint transition bay, in order to reduce the potential for landscape and visual impacts as very limited above ground infrastructure will be present post-construction phase.

6.14 The cable route alignment sought to avoid the most sensitive landscape and visual features, such as woodland, scrub and water courses, by crossing through intensive agricultural land. Where locations were identified where the cable route intercepted sensitive landscape features such as trees and woodlands, the route was adjusted to avoid these locations where possible (refer to ES **Chapter 6** for details of these routing decisions).

6.15 HDD method of crossing is proposed at a number of locations along the cable route to avoid affecting surface features. These are shown on **Figure 4.1**.

6.16 The onshore converter stations site selection process has taken into consideration landscape and visual constraints, such as local and national landscape designations, the presence of existing woodland with the potential to screen development and landscape character and sensitive views, as described in **Chapter 6** of the ES.

6.17 A decision to co-locate two converter stations was made in order to reduce the landscape and visual impacts associated with two separate locations which could potentially have more extensive impacts.

6.18 Locations for buildings and structures associated with the converter stations were sought to take advantage of the screening provided by land form and existing features, including bunds and woodland planting to the north and east of Lazenby, and to seek to use the potential of a site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.

6.19 The height of the converter stations was reduced as much as practicably possible in order to reduce the potential for visual impacts. Building heights of up to 30m were proposed within the Scoping Report, but following more detailed site selection studies and consultation, a reduction in height was agreed (to a maximum height of 20m). Buildings of a lower height, but of consequently larger footprint were therefore proposed, as an alternative to taller buildings with a smaller footprint.

6.20 Locating the converter stations within the Wilton Complex, within agricultural land to the north of the A174, was considered to make good use of existing screening afforded by bunds, woodland planting, hedgerows along the A174 to the south, in order to reduce visual impacts from Wilton and the A174 to the south and east, from Lazenby to the southwest and from Lackenby and Eston to the west. Within the land parcel identified, the converter stations were located in the north-eastern corner with the aim of maximising the distance between the settlement and the development.

Restoration Measures

6.21 Construction will follow an agreed Construction Environmental Management Plan (CEMP), which will include arrangements for implementation of various aspects of the works such as turf and soil removal, storage and replacement, and stream crossings, which will help to mitigate local impacts during the works. These will be designed in agreement with RCBC.

6.22 During construction, an Environmental Clerk of Works will monitor compliance with all environmental management requirements, plans and restoration procedures including requirements relating to the landscape and visual environment. This will include monitoring the implementation of committed mitigation measures as set out in the ES.

6.23 The following general mitigation measures for the cable routes and converter stations will be implemented during the construction phase of the project:

- Retention and protection of identified trees, shrubs and hedges that are considered to be significant (by reason of landscape or visual importance), shall be carried out in accordance with British Standards Institute (2005): BS 5837:2012 Trees in Relation to

Construction. Further details on the protection of trees and other vegetation, including ground protection methods, are included in **Chapter 25** and associated appendices;

- Best practice soil handling procedures, including DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites- Recommendations, relating to handling in inappropriate weather conditions, stockpiling and the replacement of material, shall be followed during construction. Plans of the proposed location for the stockpile of excavated materials are provided in **Chapter 5** of the ES, along with a relevant Method Statement;
- Standard construction works will be conducted during daylight hours and under normal circumstances. However, some specific construction works will need to be performed continuously and may need to be carried out outside of daylight hours. Should this be the case, suitable task lighting will be employed. Construction lighting will be designed so that it does not impinge into sensitive views, such as close views from bedroom windows of residential properties; and
- Directional lighting will be used where possible, rather than lighting on tall columns, and will be designed to face away from sensitive residential receptors.

Mitigation Measures Specific to the HVDC and HVAC Cable Route

6.24 Due to the open nature of the landscape within parts of the study area, particularly where primary and intermediate site compounds are erected, mitigation through the use of screening will not be effective in significantly altering the nature or extent of the works within the local vicinity.

6.25 The following mitigation measures represent best practice in avoiding or reducing long term impacts on the landscape, and reducing visual impacts where possible:

- Where the cable route crosses an existing hedge or tree belt, existing gaps will be used where possible so that vegetation removal is minimised;
- No unnecessary tree or shrub removal will be undertaken, and vegetation which is to be removed will be marked and agreed on site prior to any felling;
- Where removal of sections of hedgerows are unavoidable, appropriate hedge species will be replanted along the line of the existing hedge, and managed so as to restore the existing hedgerow;
- No construction related vehicular access will be permitted outside the defined working width and agreed access points; and
- Primary and intermediate construction compounds will be located in places of lower sensitivity (i.e. away from residential properties, unless otherwise agreed, and areas of valued trees and shrubs, or watercourses). Materials and machinery will be stored tidily during the works.

6.26 The following measures will be carried out to restore the excavations post construction:

- Operations will be designed so that progressive restoration of finished areas can occur where appropriate, and so that stored topsoil can be replaced on graded areas as these are finished;
- Naturalistic and sympathetically designed landscape profiles will be created once the works are complete. Slopes in the area are very gentle and this will be reflected in any grading of soils associated with restoration. Manmade slope reinforcement such as gabions, concrete, geotextiles and mesh will not be used;
- Topsoil will be replaced (using topsoil stored prior to the construction period) and evenly spread. Areas of disturbed earth will be re-graded to blend with the surrounding land form, cultivated and seeded or encouraged to regenerate naturally; and
- A restoration plan will form part of the CEMP described above. It will be implemented to restore landscape earthworks, soils and surface vegetation including alongside tracks and along cable routes.

Potential Impacts

Potential Impacts on Landscape Character and Resources

Nature of Impacts in Relation to Construction Scenarios I-III

6.27 Impacts on landscape character and resources resulting from the construction of Dogger Bank Teesside A in isolation and Dogger Bank Teesside B in isolation (Scenario I) will be very similar in nature, and of the same magnitude and level of impact. For this scenario, these comprise both direct impacts on agricultural land, including more sensitive features such as hedgerows, trees and water courses, and impacts on landscape character.

6.28 Where vegetation is cleared along the cable route, hedgerows will be replaced with native shrub mixes. This replacement vegetation will take a period of time to establish and grow (in the order of three to five years). Although arable fields and pasture will quickly blend back into the adjacent landscapes, residual impacts will remain where hedgerows have been removed for in the order of three to five years.

6.29 The extent and duration of impacts will be relatively greater than those for Scenario III if the construction of both Dogger Bank Teesside A and Dogger Bank Teesside B were to be carried out simultaneously but separately (Scenario II). The works will be discernible within the local area over a relatively short duration. Where this will give rise to change to landscape character, impacts will be short term and reversible. In the medium term impacts will result from the disturbance of vegetation and re-establishment of hedgerows (over three to five years), depending on the existing condition.

6.30 The overall maximum 'duration impact' scenario for construction of both projects is assessed as Scenario III (two discrete periods of works). Generally, direct, temporary impacts on the agricultural land along the cable route over for Scenario III will be the same nature as for Scenario II. The works will be discernible within the local area over two discrete periods of time of relatively short duration. This will give rise to reversible change to the rural character of the localised area. The resulting apparent change in character locally will result in medium term impacts from loss of vegetation and the removal of hedgerows.

6.31 It is recognised that construction sites may continue to be perceived as such for a few years even once construction is completed, because disturbed ground conditions would remain. If the two projects are built one after the other (Scenario III), but with a shorter gap of two to three years, then there will be less time for the ground and vegetation to recover after the first one. People could then perceive the work as being continuous for the whole period, even if there is actually a short gap between the active stages.

6.32 The impact on landscape character and resources that are anticipated as a result of the construction works along the cable route for all construction phasing scenarios are described in the following paragraphs. A summary of the impacts specific to the three construction phase scenarios (as defined in **Section 7**) is provided in **Table 6.1**.

Impacts on Landscape Resources and Local Landscape Character Units

Marske Sands and Redcar Flats Coastal Farmland (LCU R6)

6.33 Works within the intertidal section of the beach will be discernible from the length of beach between Marske and Redcar and from the top of the cliff banks. The presence of fencing, cofferdams, and the movement of construction vessels within the water, will give rise to a temporary change in character, although this will be set within the context of a highly industrialised landscape further north at Teesside and developed coastline at Redcar. The open, coastal character and more sensitive features such as the narrow margin of grass and remnant dunes along this stretch will not be affected. The vegetation on the banks of Long Beck, inland of the A1085 will be unaffected.

6.34 The presence of work compounds, construction traffic, fencing and cranes within the width of the cable route will be highly visible across the open and flat agricultural land between Redcar and Marske. The construction works will be temporary and change in character will be short-term. The change in character will be of a low magnitude, given the context of the existing movement

and disturbance from the A1084, and the modified character of the intensively farmed fields fringed by the sewage works, a railway line and the urban edges of Redcar and Marske.

6.35 At night, lighting of the working area will not significantly increase the level of lighting across the area as a whole, as existing floodlighting is associated with the Mackinlay Park Rugby Union Football Club to the west of the cable route, and the settlements of Redcar and Marske. Lighting may alter the existing level of lighting at the coastal edge, where the A1085 is unlit.

6.36 Overall the magnitude of change affecting the landscape between Marske Sands and the railway line southwest of Marske is considered to be low. This will reduce to negligible in the medium term as disturbed areas are reinstated. The level of impact on the landscape unit will be **minor**, during the periods of construction, reducing to negligible in the short term.

Redcar flats: Lowland Farmland South of Redcar and Marske (LCU R2)

6.37 To the south of Black's Bridge, construction activities will be discernible from the surrounding area as the route bisects a series of flat arable fields between the railway line and the A174. More sensitive features include tall, dense hedgerows along Cat Flatt Lane (a PRoW), sections of which will be removed as the cable route crosses them. An intermediate site compound will be located immediately north of the A174. During the construction period there will be localised changes of a medium magnitude, although the construction activities will be experienced in the context of the busy road and the developed edges of the settlements of Redcar and Marske.

6.38 Direct impacts through the disturbance of the agricultural fields and trenching at the watercourse at Mickle Dales will result in temporary, short term changes of a low magnitude.

6.39 South of the A174, impacts on the most sensitive features across this area will be avoided, but some localised impacts will result from the removal of sections of hedgerows containing trees between the A174 and Grewgrass Lane, and hedgerows bounding fields between Fishponds Road (to the northwest of Yearby) and Mains Dike Bridge. The loss of hedgerow sections will, in the medium term, contribute to the fragmented hedgerow pattern that is prevalent across this part of the character area. The use of HDD to cross Grewgrass Lane, Roger Dikes, Fishponds Road and Mains Dike Bridge will mean that impacts on these features and associated vegetation, as well as hedgerows and trees lining the roads, will be avoided.

6.40 The construction works and presence of the compounds to the east of Fishponds Road and the HDD compounds will temporarily reduce the rural character of the area, which in part is already characterised by incremental development at the edges of Marske and New Marske. The construction activities will be set in the context of the visual movement and audible disturbance of the A174 and set within open, large and intensively farm agricultural fields.

6.41 The magnitude of change is considered to be of a medium magnitude during periods of construction, reducing to low in the short term post-construction, on the basis that more varied topography will be re-instated to existing levels. There will be no medium term to long term impacts on the landscape as an area of open green space between settlements. The loss of hedgerows will give rise to longer term changes to the character of the unit, although this will be of a low magnitude overall.

6.42 The level of impact on the landscape unit will be **moderate** overall during the periods of construction, reducing to negligible in the medium term.

Wilton Complex (LCU W1)

6.43 The final sections of the proposed cable route are located within the Wilton Complex. The construction works will be visually contained within the south of the area and will give rise to change of a low magnitude across the landscape unit, given the highly modified character of the area. The level of impact in the short term will be **negligible** and there will be no impacts post-construction.

Impacts on Landscape Character

6.44 Impacts on the landscape character of adjacent LCUs are summarised in **Table 6.1**.

Table 6.1 Potential impacts of the HVDC cable route on landscape and character and resources

Receptor	Sensitivity	Magnitude of change (extent, duration, reversibility)	Level of impact (Regional)	Level of impact (Local)
Impacts on Landscape Character and Resources				
Marske Sands and Redcar Flats Coastal Farmland (LCU 6)	Medium	***Scenario I, Scenario II and Scenario III*** **Low** Reducing to negligible in the medium term as disturbed areas are reinstated.	**Negligible**	**Minor** reducing to **negligible** in the medium term
Redcar flats: Lowland Farmland South of Redcar and Marske (LCU R2)	Low	***Scenario I, Scenario II and Scenario III*** **Medium** Reducing to negligible in the medium term as disturbed areas are reinstated.	**Negligible**	**Moderate** reducing to **negligible** in the medium term
Wilton Complex (LCU W1)	Low	***Scenario I, Scenario II*** **Negligible** The construction works will be visually contained within the south of the area and will give rise to change of a low magnitude across the landscape unit, given the highly modified character of the area. The level of impact in the short term will be negligible and there will be no impacts post-construction impact. ***Scenario III*** **Negligible** The level of impact in the medium term will be negligible and there will be no impacts post-construction impact.	**Negligible**	**Negligible**
Impacts on Landscape Character				
Character Unit R1 Urbanised farmland (East of Wilton)	Low	***Scenario I, Scenario II and Scenario III*** **Negligible** Visibility of the construction activities from within this character unit will be very limited due to the presence of a shelter belt to the east of the area. The magnitude of change both during and	**None**	**None**

		post-construction will be negligible.		
Character Unit R3: Park and Estate Land (Kirkleatham)	High	***Scenario I, Scenario II and Scenario*** **Low** reducing to **none** post-construction Construction activities will be discernible from the southern edge of this area, where open views are available to the south across agricultural fields, visible beyond the A174. Further north the well wooded character of this area limit views to the south and therefore impacts on this area will be limited in extent and not affect the parkland character of the northern and eastern parts of the unit. Construction activities will give rise to localised, short term, reversible change. Post construction, this will reduce to none.	**None**	**Minor** reducing to **none**
Character Unit E1 Upland (Eston Hills/Eston Moor)	Medium	***Scenario I, Scenario II and Scenario III*** **Negligible** The construction works will be discernible from the more elevated areas of this character unit, from limited areas within the northeast where views are afforded over to Redcar and the surrounding lowland farmland. The works will be visible at a distance (in excess of 2km) and will be seen within the context of the highly developed and industrialised landscape of the Tees lowland. Overall the magnitude of change during the construction periods will be negligible and the impact both during and post-construction will be none.	**Negligible**	**Negligible**
Character Unit E2 Escarpment (Eston Hills)	High	***Scenario I, Scenario II and Scenario III*** **None** Due to the orientation of the escarpment and the presence of woodland on the lower lying slopes within the east of this character area there will be no or very limited visibility of the construction works. There will be no impacts on this character unit.	**None**	**None**
Character Unit E3 Parkland (Wilton Castle)	High	***Scenario I, Scenario II Scenario III*** **Negligible** There will be no visibility of the construction activities from within this character unit due to the presence of a woodland and shelter belts to the east of the area. The magnitude of change	**Negligible**	**Negligible**

		during construction will be negligible and post-construction there will be no impacts.		
Character Unit E5 North East Slopes Eston Hill	Medium	***Scenario I, Scenario II and Scenario III*** **Negligible** The construction works will be discernible from elevated areas of this character unit to the north, where views are available out over the lower-lying farmland to the north, including from the recreation area and car park at Errington Wood. The works will be discernible from a limited area of the unit, for a short duration and seen within the industrialised context of the wider Tees valley. Overall the magnitude of change during construction will be negligible and post-construction there will be no impacts.	**Negligible**	**Negligible**a

Potential Visual Impacts

6.45 Evaluation of levels of impact on views from visual receptors is presented in **Table 6.2**.

Table 6.2 Potential impacts of landfall and HVDC cable route on visual receptors

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
1	Millclose Howle Car Park	R, T Medium	***Scenario I, Scenario II and Scenario III*** Open views of the construction activities along the cable route will be available to the southeast, including to up to two landfall transition bays located in the agricultural field inland from the A1085. Activities within the intertidal area will also be clearly visible, set in front of more scenic views available along the coast to the south towards the Warsett Hill and distinctive cliffs below. The magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
2	Bydale Howle Car Park	R, T Medium	***Scenario I, Scenario II and Scenario III*** Close range views will be available of the construction works within the intertidal area, with views also available to activities along the cable route further inland across the open agricultural field to the southwest. Up to two landfall joint transition bays (Scenario II) will be clearly visible within this field, viewed across the A1085. The works will give rise to temporary change of a medium magnitude, as they will be visible against a backdrop of the settlements of Redcar and Marske, and larger industrial features within the wider landscape to the north and west. Views from this location are largely focused out to the sea or along the coastal edge to the south towards the more dramatic cliffs below Warsett Hill. These views will be largely unaffected. The magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
3	North East Corner of the Marske-by-the-Sea allotments	R Medium	***Scenario I, Scenario II and Scenario III*** Views are mostly contained within the allotments by surrounding vegetation, fencing and hedgerows at the west of the allotments. Where views open up, existing views extend north over a large, featureless open agricultural field towards the settlement edge of Redcar. Close range views will be available of construction activities along the cable route where views are	**Moderate**, reducing to **negligible** post-construction

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
			open to the west. The works will give rise to temporary change in views of a medium magnitude, which will reduce to negligible post-construction. The magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	
4	Bydales School	H, R High	***Scenario I, Scenario II and Scenario III*** Lower level views of construction activities will be largely screened by scrub and woodland to the west of the school, following Long Beck. From upper story windows activities along the cable route between the A1085 and Ryehills Farm will be visible, including up to two landfall joint transition bays (Scenario II). The works will be visible in the context of the open arable field, with the A1085 in the foreground, and Redcar and the wider industrialised landscape in the distance to the north. The magnitude of change during the construction periods will be **low** and short term, reducing to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
5	Oak Road	H High	***Scenario I, Scenario II and Scenario III*** Open views of the construction activities along the cable route will be available across the flat, broad and featureless field to the southeast, including up to two landfall transition bays (Scenario II). Construction activities will be set in front of Marske-by-Sea, backed by the distinctive Hunt Cliff, Warsett Hill and the Eston Hills in the far distance. Further inland from the coastal edge, lower-level views will be screened by buildings associated with Mackinlay Park. The magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
6	Mackinlay Park	R, T Medium	***Scenario I, Scenario II and Scenario III*** Views of construction activity will be limited along the PRoW (bridleway) that follows Green Lane by tall hedgerows, although glimpsed, filtered views will be available intermittently. Similarly, hedgerows will screen views in the direction of the works from areas to the west of Green Lane. Open views through post-fencing and intermittent hedgerows from the playing field to the east of the lane will however be available. Construction	**Minor**, reducing to **negligible** post-construction

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
			activities along the cable route will be visible within the open, flat field to the southeast, set in front of Marske-by-Sea, with Hunt Cliff and Warsett Hill beyond. Activities within sections of the cable route further south, will be screened by the sewage works and surrounding vegetation. Overall the magnitude of change during the construction periods will be **low** and short term, reducing to **negligible** post-construction.	
7	Beardmore Avenue	R High	***Scenario I, Scenario II and Scenario III*** Views are mostly contained within the settlement edge by buildings, surrounding vegetation, fencing and hedgerows at the west settlement. Where views open up, and from some second story windows, existing views extend north over a large, featureless open agricultural field towards the settlement edge of Redcar. Close range views will be available of construction activities along the cable route where views are open to the west. The works will give rise to temporary change in views of a medium magnitude, which will reduce to negligible post-construction. The magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
8	Ryehills Farm	H, R, T High	***Scenario I, Scenario II and Scenario III*** Some screening of low-level views from within the property and surrounds will be provided by vegetation at the west of the property and ancillary buildings. Views from upper storeys and from the PRoW that passes to the south will be available at close range to the northwest, including to up to two intermediary construction compounds and HDD compounds immediately north of the minor road. These will be set within the agricultural field in front of the road bridge (crossing the railway line) and the sewage works to the west and the flat open field and the sea to the north, with the edge of Redcar visible beyond. Overall the magnitude of change during the construction periods will be **medium** and short term, reducing to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
9	Marked path adjacent to the Ings	H, R, T High	***Scenario I, Scenario II and Scenario III*** Views of the construction works to the north of the railway line will be entirely screened by the	**Negligible**

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
			embankment and vegetation enclosing the railway line. Low-level views of construction activities along the cable route to the south of the railway line as passes through field east of Bridge Farm towards Cat Flatt Lane will be largely screened by vegetation surrounding Blacks Bridge and Redcar Road. The magnitude of change during the construction periods will be **negligible** and short term and post-construction.	
10	PRoW near Mickle Dales (Cat Flatt Lane)	R, T Medium	***Scenario I, Scenario II and Scenario III*** Views to the cable route to the north of Cat Flatt Lane will be largely screened from the PRoW by tall hedgerows that enclose it and by buildings and greenhouses associated with the farm to the east. Where open views are available from the farm into the field to the east, close range views of construction activities along the cable route will be available between the railway line and Cat Flatt Lane to the southeast. Sections of the cable route to the north of the railway line will be screened by the railway embankment and vegetation. In the medium term, the removal of large sections of hedgerow bounding Cat Flatt Lane will give rise to medium term change as views are opened out across adjacent fields to the edge of Marske. In the long term this will reduce to negligible as the hedgerow become re-established. The magnitude of change overall will be **medium** during the construction periods. This will reduce to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction in the medium term
11	Longbeck Station	R, T Medium	***Scenario I, Scenario II and Scenario III*** Low-level views will be largely screened by intervening vegetation, including hedgerows bounding a series of fields to the west of the station, and buildings to the south. Up to two primary construction compounds located adjacent to the A174 will be visible, as will activities along the route, but these will form temporary, minor feature in the flat and complex landscape. The magnitude of change overall will be **low** during the construction periods, given the complex nature of the view, which includes extensive existing development, and the distance from the cable route. This will reduce to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
12	Junction of A174 and PRoW at Tunstall Gardens	H, R, T Medium	***Scenario I, Scenario II and Scenario III*** Travelling receptors on the A174 will experience open, close range views when travelling both east and westbound, of construction activities taking place both the north and south of the A174, including up to two primary construction compounds and HDD compounds. Similar views will be available from the PRoW that crosses the road at this point. Open views will also be available from upper storey windows of properties at the edge of the Redcar, with views from lower storeys screened in part by vegetation at the southern fringes of Mickle Dales and young tree planting to the north of the A174. The magnitude of change in the views out over the flat open and semi-rural landscape during construction periods will be **high**. This will reduce to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction
13	Grewgrass Farm	H, T High	***Scenario I, Scenario II and Scenario III*** Construction activities along the cable route will be visible from the property and surroundings as the route passes through the open fields to the south, including two HDD compounds located either side of Grewgrass Lane. Views from the property are focused in this direction, towards the Eston Hills, and the works will be visible at relatively close range in the foreground of New Marske and the wooded hills beyond. Views will also be available of sections of the route to the east, including up to two primary construction compounds adjacent to the A174. Some lower level activities will be screened by intervening hedgerows which contain hedgerow trees. A belt of trees to the east of the property may filter views to an extent, particularly if construction activities take place during summer months when they are in leaf. Sections of the route to the west of Grewgrass Lane will also be visible, but partly screened by vegetation fringing Roger Dikes. The magnitude of change during construction periods will be **medium**. The magnitude of change will reduce to **negligible** post-construction and in the long term, once the restored sections of hedgerows have become established.	**Moderate**, reducing to **negligible** post-construction
14	New Marske Methodist	R	***Scenario I, Scenario II and Scenario III*** The position of the PRoW, which follows a slightly	**Minor**, reducing to **negligible**

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
	Church and St. Thomas' Church	Medium	sunken lane enclosed by tall hedgerows, and the Church, which is set slightly below undulating ground rising to the north, restricts views over the fields to the northwest. Lower level activities within the cable route will be screened by hedgerows and vegetation around the allotments to the north of the settlement. Views for travelling receptors using Gurney Street will be largely screened by trees, intervening hedgerows and the gently rising topography to the north. Overall the magnitude of change will be **low** during the periods of construction, reducing to **negligible** post-construction.	post-construction
15	Sparrow Park Farm	H High	***Scenario I, Scenario II and Scenario III*** Gently rising ground to the north of this location and hedgerows running approximately parallel to the Longbeck Lane will limit low-level views of the construction activities from the Lane, properties to the south of the Lane and from Sparrow Park Farm. Views will be available from upper-storey windows to the north. The works will be seen as the route passes through agricultural fields in the foreground to the settlement edges of Redcar, within the context of industrial development within the wider landscape to the north. Overall the magnitude of change will be **low** during the periods of construction, reducing to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
16	Junction of Lindrick Road and Longbeck Lane and Fell Briggs Farm	H, T High	***Scenario I, Scenario II and Scenario III*** The flat topography and hedgerows bounding Grewgrass Lane and fields to the north will screen views of lower-level construction activities. More open views are likely to be available from upper-storey windows to the north, including the HDD compounds located either side of the lane. The works will be seen as the route passes through agricultural fields between New Marske and the settlement edges of Redcar, within the context of industrial development within the wider landscape to the north. Overall the magnitude of change will be **low** during the periods of construction, reducing to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
17	The Filter House and	H, T	***Scenario I, Scenario II and Scenario III*** The gently rolling topography and vegetation along	**Negligible**

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
	Thrushwood Farm	Medium	Roger Dikes limit visibility to the north from this location. Overall the magnitude of change will be **negligible** during the periods of construction and post-construction.	
18	Errington Wood	R Medium	***Scenario I, Scenario II and Scenario III*** From this viewpoint, elevated views over the construction works along a large extent of cable route will be available, from Marske Sands to the southeastern edge of the Wilton Complex. The construction works will be visible as a concentration of movement and activity within agricultural land dispersed between the settlements of Marske-by-the-Sea, New Marske, Redar and Yearby. The movement and activities will be set within the context of extensive existing industrial development, including stacks, chimneys and industrial development that extend to the north and west. The construction works will be a further, small element within a wide panorama. Overall the magnitude of change will be **negligible** during the periods of construction and post-construction.	**Negligible**
19	Junction of Larkswood Road, Plantation Road and A174	H, T High	***Scenario I, Scenario II and Scenario*** Views from the short footpath between Plantation Road and the A174 are available across the A174 to the open fields beyond, within which construction works along the cable route will be clearly visible. At this distance the construction activities will be visible, but will not form a large component in the view which is directed primarily to the hills beyond in the distance. Views from properties along Plantation Road themselves will be screened by the low embankment and tree planting between the road and the A174. Overall the magnitude of change will be **low** during the periods of construction, reducing to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
20	Turners Arms Farm	H, R, T High	***Scenario I, Scenario II and Scenario III*** Low-level views and views from upper storeys of the property and surrounds will be available to the construction works as the cable route passes through open agricultural fields to the north and west. Up to two intermediary construction compounds will be visible at close range to the north of the property, which will form a prominent	**Moderate**, reducing to **negligible** post-construction

No.	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change (extent, duration, reversibility)	Level of impact (Scenarios I, II, and III)
			feature due to the proximity and the flat, open nature of the land. Views will be partly filtered in some locations by vegetation and trees surrounding the property, particularly in summer months. The magnitude of change overall will be **medium** and of a short duration the construction periods. This will reduce to **negligible** post-construction.	
21	Conservation Area village of Yearby	H, T High	***Scenario I, Scenario II and Scenario III*** From the northern extent of the settlement views may be available across the flat, open fields to the north and west. Sections of the cable route further to the west will be set in front of the busy A174 and the Wilton Complex. The magnitude of change overall will be **low** during the construction periods, given the setting of the view in relation to the Wilton Complex, which includes extensive industrial infrastructure, and the distance from the cable route. This will reduce to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
22	Kirkleatham Old Hall Museum and Owl Sanctuary; Conservation Area village of Kirkleatham	H, R High	***Scenario I, Scenario II and Scenario III*** From the minor road at the south of Kirkleatham, long views to the south are available across large, flat agricultural fields, to the Eston Hills on the skyline in the distance. The construction activities within the cable route will be visible within the fields immediately beyond the A174, although hedgerows bounding the intervening fields and the A174 will partly screen lower-level views. The magnitude of change overall will be **medium** during the construction periods, given the rural setting of the view in this direction and the presence of the A174. This will reduce to **negligible** post-construction.	**Moderate**, reducing to **negligible** post-construction

Converter Stations

Impacts on Landscape Character and Resources of the Site

6.46 At the proposed location of the converter stations, the local landscape resources comprise large agricultural fields, bound by drainage ditches and post and wire fencing. These are considered to be of low sensitivity.

6.47 For all construction phasing scenarios, localised, temporary impacts will result from the disturbance to the agricultural fields, with some impacts on field boundary vegetation largely at the perimeter of the site. More sensitive features bounding the site, including the woodland belt to the east will be unaffected. Overall construction activities will result in a long term localised change of a medium magnitude.

6.48 Impacts related to the additional lighting during the construction phase will be experienced in relation to the extensive lighting of the Wilton Complex, immediately to the north of the site. The magnitude of change associated with lighting is therefore considered to be low for all construction scenarios.

Scenario I

6.49 The removal of areas of topsoil and the establishment of an internal access track between the construction compound to the north of the site will give rise to direct but localised impacts on the site. Upon completion of construction, the ground will be reinstated at the location of the compound. The change will be localised, of short term duration and of a medium magnitude.

6.50 The magnitude of change is judged to be medium overall, giving rise to impacts of a **moderate** level.

Scenario II

6.51 The extent of impacts should Dogger Bank Teesside A & B be constructed concurrently will be relatively greater than for Scenarios I and II. The establishment of two construction compounds will give rise to direct impacts on a larger extent of the agricultural fields simultaneously. However, given the relative visual containment of the site, this would not mean that the works would be discernible across a wider area at any one time. Construction traffic and activity will be of a higher intensity than for Scenarios I and III, although these will be largely the same in nature and will not give rise to additional changes to the landscape character of the surrounding area, given both the visual containment of the site and that the access will be from within the Wilton Complex.

6.52 In the medium term, disturbed ground at the location of the construction compounds will be reinstated after completion of the works.

6.53 The magnitude of change is judged to be medium overall, giving rise to impacts of a **moderate** level.

Scenario III

6.54 Generally, the temporary and long term impacts on the landscape resources and character of the site given two discrete periods of works (Scenario III) will be the same nature as for Scenario II, but of longer duration. The temporary access tracks and the disturbed ground at the location of the construction compounds will be reinstated subsequently after each phase of works, giving rise to a medium magnitude of change. When considered together, the change to the landscape resources of the site overall will be of a medium magnitude, as a result of the construction activities associated with the converter halls and internal roads, infrastructure and buildings, and the construction compounds themselves being present within the agricultural field. The works will be discernible within the local area over two discrete periods of time. This will give rise to localised change on the character of the surrounding area of a medium magnitude, on the basis that the time in which the activities will be discernible will result in long term, rather than medium term impacts.

6.55 The magnitude of change is judged to be medium overall, giving rise to impacts of a **moderate** level.

Impacts on Landscape Character

Wilton Complex LCU (W1)

6.56 The converter stations site is located within the Wilton Complex Character Unit (W1 LCU). The proposed construction works in all three scenarios will affect a small and localised part of the area and will occur within the context of a highly modified landscape with strongly influenced by industrial features. Existing infrastructure and movement within the complex are sources of movement and noise which also contribute to the modified character of the landscape immediately north of the site. The works will be less discernible to the north from the wider character area, due to intervening infrastructure and buildings within the complex.

6.57 The impacts on the landscape resources of the site and the impacts relating to the movement of vehicles and machinery within the site, will give rise to a low magnitude of change to the character of character unit overall in all three scenarios, resulting in a **negligible** level of impact.

Upland - Eston Hills (LCU E1), Escarpment - Eston Hills (LCU E2), and Parkland – Wilton (LCU E3)

6.58 The construction activities will not be discernible from wider landscape character units to the east. Impacts on LCUs to the south and west from the wider landscape, including E3 Parkland (Wilton), E2 Escarpment (Eston Hills) and E1 Upland (Eston Hills) LCUs, will also be very limited due to the low-lying, partly enclosed nature of the site and well-wooded character of the lower slopes of the escarpment. Where views are available of the site and construction works, these will be set within the context of the Wilton Complex and therefore the magnitude of change will be **negligible**.

Landscape Character within the Wider Study Area

6.59 Overall, impacts on other landscape character areas will be negligible due to the contained and localised nature of the impacts. Impacts on the NCA 23 Tees Lowlands landscape character area (on a regional scale) will be **negligible**.

Potential Visual Impacts

Residential Receptors

6.60 In all three scenarios, construction activities within the southern parts of the sites will be visible from limited areas at the north eastern edge of Lazenby (represented by **Viewpoint 1**). The northern extent of the sites will not be visible from residential receptors within Lazenby due screening by bunding and woodland to the north of the settlement. Views of low-level activities will not be visible from the remainder of the settlement. Cranes, and taller elements, such as the converter halls, under construction on the site will be temporarily visible above the line of trees and bunds to the northeast, giving rise to short term (Scenario I and II) or two discrete periods of short term (Scenario III) visual impact of a low magnitude. The change will be viewed in the context of the existing tall structures within the Wilton Complex.

6.61 For residential receptors at the north eastern edge of Lazenby, the magnitude of visual change during the construction period(s) in all two scenarios is considered to be medium and the level of impact **moderate**.

6.62 The construction activities will not be visible from the remainder of the village. The magnitude of visual change within the wider settlement of Lazenby, to the south and west, will therefore be negligible, and the level of impact **none**.

6.63 In views from the south eastern edge of Lackenby (at the south eastern edge of Eston), low level construction activities will be screened by vegetation surrounding Lazenby and following the A1053. Some of the taller elements will be visible, but viewed in the context of the Wilton Complex and network of overhead power lines, these will give rise to a low magnitude of change of short-term duration. Overall the magnitude of visual change within residential areas at the eastern extent of Eston will be negligible and the overall impact **none**.

Recreational Receptors

6.64 Views will be available of the construction compounds and low level construction activities at the north of the site from a short section of Pasture Lane to the north (represented by **Viewpoint 2**)

in all three scenarios. From much of the track views will be screened by bunding, tree planting and vegetation lining the track. Where open views are available from the track, the magnitude of change will be low and the level of impact **minor**.

6.65 Views of tall machinery and structures under construction on the site will be available from the PRoWs crossing Lazenby Bank where open views to the north are available (represented by **Viewpoint 4**). Lower level construction activities will be screened by vegetation, including the construction compounds. The taller elements will be viewed in relation to the Wilton Complex and existing cooling towers, stacks and chimneys within it as well as the wider industrial context of the Tees Valley. Overall the magnitude of change in views from Lazenby Bank will be low and the level of impact **minor**.

6.66 Elevated views over the site and of the entirety of the construction works are available from Eston Nab and the PRoWs that follow the ridgeline at the top of the escarpment of the Eston Hills (represented by **Viewpoint 7**), in all three scenarios. The construction works will be visible as a concentration of movement and activity at the southern extent of the Wilton Complex, set within the context of the stacks, chimneys and industrial development that extend to the north and west. The construction works will be a further, small element within a wide panorama from the PRoWs, which includes extensive industrial development, roads and other infrastructure. Overall the magnitude of change will be low and the level of impact **minor**.

Travelling Receptors

6.67 Views from the A174 of low level activities will be screened by the existing bunds and woodland planting to the north of the road. The magnitude of change will be low in all three scenarios and the level of impact **negligible** overall.

6.68 Views from the A1053 will be screened by the existing tree belts and vegetation to the east and southeast of the road. Taller elements will occasionally be visible above vegetation in views to the south, back clothed by the wooded escarpment. The magnitude of change will be low in all three scenarios and the level of impact **negligible** overall.

Impacts on Views at Viewpoints

6.69 An evaluation of levels of impacts on views and visual amenity from each of the viewpoints which have been examined is presented in **Table 6.3**.

Table 6.3 Potential visual impacts at assessment viewpoints

Viewpoint	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenarios I, II and III)
Viewpoint 1: Lazenby, northern edge	H High	***Scenario I*** Lower-level activity within the northern extent of the site and the construction compounds will be screened by the bund to the north. Open, close range views of activities within the south of the site will be available, framed by grassed bunds to the east and north of the viewpoint. The activities will be viewed in the context of several tall stacks and large cooling tower, which form a complex skyline to the east. The magnitude of change will be **medium.** ***Scenario II*** Open, close range views of activities within the south of the converter stations site will be available, framed by grassed bunds to the east and north of the viewpoint. Lower-level activity within the northern extent of the sites and both construction compounds will be screened by the bund to the north. The activities will be viewed in the context of several tall stacks and large cooling tower, which form a complex skyline to the east. The magnitude of change will be **medium**. ***Scenario III*** Open, close range views of activities within the south of the converter stations site will be available. On completion of the first project, the first constructed converter station may be visible or partially visible (depending which is constructed first) and viewed in conjunction with the subsequent construction activities of the second project. Lower-level activity within the northern extent of the easternmost part of the site will be screened in part by the western converter hall, should the western converter station be developed first. The activities will be viewed in the context of several tall stacks and large cooling tower, which form a complex skyline to the east. The magnitude of change will be **medium**.	**Moderate**

Viewpoint	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenarios I, II and III)
Viewpoint 2: Pasture Lane, Lazenby	R Medium	***Scenario I*** Construction activities at the north of the site will be visible at close range in the field to the east. Most of the construction activities within the site will be screened by the bund to the east. The construction activities will be seen in the context of existing stacks, cooling towers and large buildings within the Wilton Complex the left of the view, which together create a skyline dominated by industrial development. The magnitude of change will be **low**. ***Scenario II*** The construction compound of the Dogger Bank Teesside B converter station and low level construction activities at the north of the site will be visible at close range in the field to the east. Construction activities related to the Dogger Bank Teesside A converter station are likely to be screened by the compound and most of the construction activities within the site will be screened by the bund to the east. The construction activities will be seen in the context of existing stacks, cooling towers and large buildings within the Wilton Complex to the left of the view, which together create a skyline dominated by industrial development. The magnitude of change will be **low**. ***Scenario III*** On completion of the first project, the first constructed converter station will be visible and viewed in conjunction with the subsequent construction activities of the second project. Should the westernmost converter station be developed first, construction taking place at the north of the site will be largely screened by the western converter station and the construction compound located within the northwest of the site. The magnitude of change will be **low**.	**Minor**
Viewpoint 3: Wilton Castle, Wilton	H, R Medium	***Scenario I, Scenario II and Scenario III*** Construction activities, including the taller elements will be barely discernible due to screening by woodland and tree belts in the foreground (within the grounds of the castle) and to the south of the Wilton Complex. Taller machinery and structures may be partly visible during winter months although these will be filtered and set within the context of existing stacks and cooling towers. The magnitude of change will be **negligible**.	**Negligible**

Viewpoint	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenarios I, II and III)
Viewpoint 4: Lazenby Bank	R Medium	***Scenario I and Scenario II*** Filtered views of construction activities will available through to the northeast within an agricultural area between Lazenby and the Wilton Complex. The construction compounds in both scenarios will be visible above a woodland belt to the southwest of the site. Construction works within the east of the converter stations site undertaken during summer months, when vegetation is in leaf, will be largely screened by vegetation within the golf course to the north of the viewpoint. In all scenarios, the works will be viewed in the context of the complex skyline, dominated by industrial development to the north. Construction activities will give rise to a further concentrated area of activity to the south of the Wilton Complex, but will form a minor element within the wider setting of the view. The magnitude of change will be **negligible**. ***Scenario III*** Construction activities will be discernible over two separate periods during winter months, through foreground vegetation. On completion of the first project, the upper parts of the first constructed converter station will be visible and viewed in conjunction with the subsequent construction activities of the second project. During both periods of construction, the works will form a minor element within the wider industrial setting of the view. The magnitude of change will be **negligible.**	**Minor**
Viewpoint 5: A1042, southwest of Kirkleatham	R, T Medium	***Scenario I, Scenario II and Scenario III*** Most construction activities, including the taller elements will be barely discernible from this location, due to the intervening tree belt at the eastern edge of the Wilton Complex. Construction activities taking place during winter months may be visible, through the tree belt when vegetation is not in leaf although views will still be filtered. The magnitude of change will be **negligible**.	**Negligible**
Viewpoint 6: South Lakenby	H, R, T High	***Scenario I, Scenario IIand Scenario III*** Views to the proposed construction compounds and lower-level vehicle movements and earthworks will be screened by intervening vegetation. Taller elements will be visible above the woodland and vegetation, set in front of several tall stacks and cooling towers. The activities will be viewed in the context of the lines of overhead power lines which further contribute to a complex skyline to the east.	**Negligible**

Viewpoint	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenarios I, II and III)
		The magnitude of change will be **negligible.**	
Viewpoint 7: Eston Beacon, Eston Nab	R High	***Scenario I and Scenario II*** From this viewpoint, elevated views over the site and of the entirety of the construction works will be available. The construction works will be visible as a concentration of movement and activity within agricultural land at the southern extent of the Wilton Complex. The movement and activities will be set within the context of the stacks, chimneys and industrial development that extend to the north and west. The construction works will be a further, small element within a wide panorama from the PRoWs, which includes extensive industrial development, roads and other infrastructure. Overall the magnitude of change will be **low**. ***Scenario III*** On completion of the first project, the first constructed converter station will be visible and viewed in conjunction with the subsequent construction activities of the second project. The magnitude of change will be **low**.	**Minor**

HVAC Cable Route and Modification Works at the Existing NGET Substation at Lackenby

6.70 Potential impacts arising from construction activities in relation to the three construction scenarios are as those described for the HVDC cable route above. The potential impacts on landscape character and resources that are anticipated as a result of the construction works along the cable route and those associated with the enabling works at the existing NGET substation at Lackenby are described in the following paragraphs.

6.71 As with the HVDC cable route, the process of open cut trenching for the HVAC cable route will be carried out progressively section by section, and will involve temporary disturbance primarily to agricultural parcels within the Wilton Complex and agricultural land between the A153 and the existing NGET substation at Lackenby, the presence of intermediate construction compounds to the northeast, open trenches, stock piles of excavated material, fencing and the movement of vehicles and machinery.

6.72 Potential impacts relating to the modification works at the existing NGET substation at Lackenby will primarily arise from activity and presence of machinery during the construction of buildings and infrastructure within the perimeter. Temporary lighting may be used. The changes resulting from construction will in themselves be short-term, e.g. visibility of equipment/machinery, as there will be no longer term changes resulting from construction, e.g. loss of vegetation, as all works will take place within the perimeter of the existing NGET substation at Lackenby.

Impacts on Landscape Character and Resources

Wilton Complex (LCU W1)

6.73 The HVAC cable route passes through the Wilton Complex, crossing the southern edges of a series of large scale agricultural fields immediately to the north of the track, following the alignment of an internal access road. The track is lined with hedgerows and hedgerow trees, with more substantial areas of vegetation to the west.

6.74 West of the A1053, the cable route passes through a margin of low-lying and flat farmland, largely comprising intensely managed agricultural land between the road and the existing NGET substation at Lackenby. The landscape within and immediately surrounding the Wilton Complex and is strongly influenced by the existing infrastructure associated with the Wilton Complex as well as the existing NGET substation at Lackenby and the A1053, and is considered to be of low sensitivity. There will be limited impacts upon more sensitive features present along the cable route, including sections of hedgerows that will be removed at the southern extent of the agricultural fields within the Wilton Complex. These will be of a medium magnitude locally, on the basis that where these are disturbed or removed they will be re-established in the long term.

6.75 The local landscape is strongly influenced by the presence of the existing NGET substation at Lackenby, development within the Wilton Complex which is present in views to the northeast and large overhead power lines. The movement of vehicles and machinery and the establishment of intermediate site compounds to the northeast of the existing NGET substation at Lackenby will result in direct, temporary change of a medium magnitude. Post-construction, the removal of hedgerows will give rise to medium term, localised change of a low magnitude, which will diminish over time as new planting becomes established.

6.76 The construction activities which are likely to take place within the north-eastern and southern extents of the existing NGET substation at Lackenby will give rise to temporary change in the landscape immediately surrounding it, although the vegetation to the southwest will limit the visibility of the works taking place within the southwest. The will be no loss of existing features within the area as a result of the works, and the change in character will be of a low magnitude given the extent of existing infrastructure.

6.77 Overall the level of impact on landscape character and resources of the site and immediate surroundings resulting from the construction of the HVAC cable route and modification works at the existing NGET substation at Lackenby will be **minor**, reducing to negligible in the short term.

Impacts on Landscape Character

6.78 Impacts on adjacent LCUs E1 Upland (Eston Hills) and E2 Escarpment (Eston Hills) will result from the visibility of the works during the construction periods. A summary of these impacts are provided in **Table 6.4**.

Table 6.4 Potential impacts of HVAC cable route and modification works at the existing NGET substation at Lackenby on landscape and character and resources

Receptor	Sensitivity	Magnitude of change (extent, duration, reversibility)	Level of impact (Regional)	Level of impact (Local)
Impacts on Landscape Character and Resources				
Wilton Complex (LCU W1)	Low	***Scenario I and Scenario II*** **Low** (localised, short term, reversible) ***Scenario III*** **Low** (localised, medium term, reversible)	**Negligible**	**Minor** reducing to **none** post-construction
Impacts on Landscape Character				
Character Unit E1 Upland (Eston Hills/Eston Moor)	Medium	***Scenario I, Scenario II and Scenario III*** **Negligible** The construction works will be discernible from elevated areas of this character unit to the north, where views are available out over the lower-lying farmland to the north, including from the recreation area and car park at Errington Wood. The works will be discernible from a limited area of the unit, for a short duration and seen within the industrialised context of the wider Tees valley. Overall the magnitude of change during construction will be negligible and post-construction there will be no impacts.	**None**	**Negligible**
Character Unit E2 Escarpment (Eston Hills)	High	***Scenario I, Scenario II and Scenario III*** **Negligible** The construction works will be visible from elevated areas of this character unit to the north, where views are available out over the lower-lying farmland to the north, including from the recreation area and car park at Errington Wood. The works will be discernible from a limited area of the unit, for a short duration and seen within the industrialised context of the wider Tees valley. Overall the magnitude of change during construction will be negligible and post-construction there will be no impacts.	**None**	**Negligible**

Potential Visual Impacts

6.79 An evaluation of levels of impact on views from visual receptors associated with the HVAC cable route is presented in **Table 6.5**.

6.80 As with the HVDC cable route construction, the majority of the visual receptors identified will experience a change in view of a similar nature and extent in all three scenarios. Therefore the assessment of the overall magnitude of change and level of impacts reported in the table applies to Scenarios I to III, unless otherwise stated.

Table 6.5 Potential impacts of HVAC cable route on visual receptors

	Location	**Receptor and sensitivity** (H: Residential, R: Recreational, T: Travelling)	**Magnitude of change**	**Level of impact** (Scenarios I, II and III)
24	Pasture Lane, Lazenby	R Medium	***Scenario I, Scenario II and Scenario III*** Views of the construction works will be largely screened by intervening hedgerows and scrub. The magnitude of change will be negligible both during the construction periods and post-construction.	**Negligible**
25	A1053 Greystone Road	T Low	***Scenario I, Scenario II and Scenario III*** Views at close range will be available when travelling in both directions on the A1053. The works will be visible in the context of the existing NGET substation at Lackenby. Overall the magnitude of change during the periods of construction will be **low**, reducing to **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
26	Lackenby Lane PRoW	R, H High	***Scenario I, Scenario II and Scenario III*** Views to the construction works within a small section of the HVAC cable route will be available to the northeast of the substation, framed by the line of perimeter fencing at the northern boundary of the substation and woodland planting. The cable route and construction works within the corridor will be visible within an open field beyond the substation, set in front of vegetation fringing the A1053 and the Wilton Complex beyond. The grid enabling works at the northeast and south of the substation will be largely screened by existing infrastructure. The magnitude of change will be **low** during periods of construction and **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction
27	Crow Lane, Lackenby	H High	***Scenario I, Scenario II and Scenario III*** Views to the construction works along the cable route will be largely screened by the the existing NGET substation at Lackenby and intervening hedgerows. Close range views of building works taking place at the southern extent of the substation, including the extension to the GIS building west of High Farm. The change in views will be short term in duration and set	**Minor**, reducing to **negligible** post-construction

	Location	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact (Scenarios I, II and III)
			within the context of the existing buildings and infrastructure present. The magnitude of change will be **low** during periods of construction and **negligible** post-construction.	
28	Wilton Way	H, R High	***Scenario I, Scenario II and Scenario III*** Views to the construction works along the cable route and enabling works within the northeast and south of the substation will be filtered by existing substation infrastructure. The magnitude of change will be **low** during periods of construction and **negligible** post-construction.	**Negligible**
29	South Lackenby	H, T High	***Scenario I, Scenario II and Scenario III*** Views to the construction works will be largely screened by the existing NGET substation at Lackenby and intervening hedgerows and vegetation surrounding properties within South Lackenby. The magnitude of change will be **low** during periods of construction and **negligible** post-construction.	**Minor**, reducing to **negligible** post-construction

Proposed Additional Mitigation

6.81 As discussed, the open nature of the landscape within HVDC and HVAC cable route study area, particularly where primary and intermediate site compounds are planned, is such that mitigation through the use of screening will not be effective in significantly altering the nature or extent of the works within the local vicinity. Further mitigation measures through the use of planting or bunding are not therefore proposed for the HVDC and HVAC cable route.

6.82 Measures to reduce landscape and visual impacts have been embedded into the design of the converter stations. Additional mitigation measures to reduce visual impacts on residential receptors within the northeast of Lazenby, as detailed in **Section 7** of this report, include the extension of existing areas of bunding and additional native woodland planting to the southwest of the site, as illustrated in the Indicative Landscape Mitigation Plan presented in **Figure 7.1**.

6.83 Construction activities related to the extension of the bunds will follow an agreed Construction Environmental Management Plan (CEMP), which will include arrangements for implementation of various aspects of the works, to help mitigate local impacts. The following general mitigation measures will be implemented:

- Temporary hoarding will be erected around the site prior to construction;
- Standard construction works will be conducted during daylight hours and under normal circumstances no task lighting will be required during construction. Some specific construction works will need to be performed continuously and may need to be carried out outside of daylight hours. Should this be the case, suitable task lighting will be employed;
- Naturalistic and sympathetically designed bund profiles will be created using subsoil scraped from the construction area for the core of the bunds, and topped with appropriately stored topsoil removed from the construction area, and from the footprint of

the bunds, prior to the commencement of this work. Topsoil depths will reflect those in the surrounding area. The slopes of the existing bunds are gentle, with concave tie-ins and this will be reflected in the grading of the bunds and in the process of topsoiling. Manmade slope reinforcement such as gabions, concrete, geotextiles and mesh will not be used; and

- All areas of disturbed earth will be cultivated and seeded with appropriate grasses and wild flora and planted with an appropriate mix of native tree species (to be agreed with RCBC).

6.84 A restoration plan will form part of the CEMP as described above.

Residual Impacts

HVDC Cable Route

6.85 Measures to reduce landscape and visual impacts are embedded into the design of the cable route and the restoration proposals. All residual visual impacts are therefore as predicted in the assessment presented in **Tables 6.1** and **6.2**.

6.86 There will be no significant landscape or visual impacts remaining after restoration works have been completed and once vegetation has regenerated. Temporary impacts during construction of the works will be reduced to negligible once restoration is complete and vegetation has regenerated, in the medium term.

Converter Stations

6.87 The construction phasing and the timing for the incorporation of mitigation measures are not fully detailed at this time. A worst case is therefore assumed whereby the work associated with the bunding and woodland planting is undertaken at the end of the construction period (Scenario I) or at the end of the construction period for the second converter station (Scenario II), and will therefore not be in place for most of the duration of the construction period.

6.88 During the construction of the bunds, potential landscape and visual impacts will arise as a result of activities and disturbance in the working areas, including erection of hoarding around the construction site, stripping of topsoil, movement of construction vehicles, and associated lighting.

Residual impacts on Landscape Character and Resources

6.89 The works relating to the construction of the bunds will affect a small area of existing agricultural fields of low sensitivity immediately to the northeast of the Lazenby within the Wilton Complex character area (LCU W1). The change to the landscape resources and character of the area and immediate surroundings will be very localised and short term. Negative impacts on the area will reduce over time as the areas of woodland planting on the proposed bunds matures. Impacts will be **moderate** during the period of construction, reducing to **negligible** post-construction.

6.90 There will be no impacts on adjacent LCUs within the study area as the visibility of the works from these areas will be very limited.

6.91 Residual impacts on landscape character and resources of the site are summarised in **Table 6.6**.

Table 6.6 Summary of residual construction impacts of the converter station(s) on landscape and character and resources

Receptor	Sensitivity	Magnitude of change (extent, duration, reversibility)	Level of impact	Residual level of impact
Landscape character and resources of the site				
Wilton Complex (LCU W1)	Low	***Scenario I, Scenario II and Scenario III*** Construction works within the site, including removal of areas of topsoil, the establishment of internal access tracks, and the construction of off-site bunding to the southwest, will give rise to direct but localised impacts on the landscape of the site and immediate surroundings. The change will be localised, of short term duration and of a medium magnitude. **Medium** (localised, short term, reversible)	**Moderate** reducing to **Negligible** post-construction	**Moderate** reducing to **Negligible** post-construction
Landscape character				
Character Unit E1 Upland (Eston Hills/Eston Moor)	Medium	***Scenario I, Scenario II and Scenario III*** **Negligible**	**Negligible**	**Negligible**
Character Unit E2 Escarpment (Eston Hills)	High	***Scenario I, Scenario II and Scenario III*** **Negligible**	**Negligible**	**Negligible**
Character Unit E3 Parkland (Wilton)	High	***Scenario I, Scenario II and Scenario III*** **Negligible**	**Negligible**	**Negligible**

Residual impacts on views

6.92 The construction of extended areas of bunding will primarily affect residential receptors at the north-eastern extent of Lazenby (represented by **Viewpoint 1: Lazenby**). At Viewpoint 1, a visual change of a medium magnitude will be experienced in the short term during the period of construction activity, reducing in the medium term, post-construction, as the extended bunds become vegetated and integrate visually with the existing grassed bunds. It is likely that people in the upper stories of properties, with windows looking out towards the proposed converter stations, will see both the construction of the bunds, and longer views of the construction works associated with the converter stations behind it. Overall, residual visual impacts on residents within the northeast of Lazenby will be of a **moderate** level during the period of construction of the converter stations in Scenarios I and II. Long term visual impacts relating to the presence of the bunds during operation are assessed in **Section 7**.

6.93 Views of the construction works will be limited from most of Lazenby, due to screening by the houses within it. From the wider area to the south, west and east, intervening vegetation and buildings within Lazenby will screen views of the works.

6.94 Views from elevated areas within the Eston Hills (represented by **Viewpoint 7: Eston Nab**) will be available, although at this distance the works will give rise to negligible visual change.

HVAC Cable Route and modification works at the existing NGET Substation at Lackenby

6.95 Measures to reduce landscape and visual impacts have been embedded into the design of the cable route and the restoration proposals. All residual visual impacts are therefore as predicted in the assessment presented in **Tables 6.4** and **6.5**.

6.96 As with the HVDC cable route, there will be no significant landscape and visual impacts of construction remaining after restoration works have been completed and vegetation has regenerated. Temporary impacts during the construction works will be reduced to negligible once restoration is complete and vegetation has regenerated in the medium term.

7 Assessment of Impacts During Operation

Introduction

7.1 This assessment considers the residual impacts during the operation of the converter stations. The assessment of landscape and visual impacts during operation of the landfall and cable route has been scoped out, as the buried cable will not be discernible once the trenches have been backfilled and land cover re-established, and there will be no significant impacts.

7.2 Two scenarios are assessed, as set out in **Section 7**, as follows:

- Operation Scenario I: Dogger Bank Teesside A or Dogger Bank Teesside B operating in isolation;
- Operation Scenario II: Dogger Bank Teesside A & B, operating concurrently.

7.3 The 'worst realistic case' assessed in this section is assumed to be Scenario II, i.e. that both projects are operational at the same time. The location and indicative layout of the converter stations are illustrated in **Figures 7.1**.

7.4 The operation of the converter stations is expected to last for a period of 25 years, before decommissioning. The operating scenarios on which this assessment has been based are set out in **Section 5**.

7.5 The assessment of residual impacts considers impacts at year 1 and at year 10 to give consideration to the seasonal and temporal difference in impacts arising from the degree of vegetative screening/filtering, as described in **Section 3**.

Sources of Impacts

7.6 Sources of key landscape and visual impacts arising during the operational phase of the converter station(s) will include the presence of the following:

- Converter stations, including the two converter halls (maximum dimensions of each converter hall 110m long x 75m wide x 20m high);
- Presence of two switch yards (AC yards), transformers and cooler banks (up to approximately 10m in height) and lightning rods (maximum height 30m from ground level;
- Presence of bus bars of a maximum height of 11m;
- Presence of buildings (control building) and internal access roads;
- Upgraded existing farm track to north and access point;
- Vehicle movements as part of routine maintenance on access roads;
- Signage and security fencing (maximum height of 2.4m) at the site boundary;
- Lighting; and
- The long term presence of new sections of vegetated earth bunding, designed to help screen views from the northeast of Lazenby.

Embedded Mitigation

7.7 As described in **Section 6**, in order to minimise negative impacts on the landscape and views, a number of siting and design objectives were considered during the site selection process. These sought to reduce significant impacts through alterations to the broad-scale and detailed siting of the two converter stations, as well as their layout and design (insofar as was possible given the constraints of other disciplines). Additional mitigation such as landscaping and planting is provided later in this section.

7.8 A summary of the key embedded mitigation measures is as follows:

- The siting of the new buildings and components avoid designated areas of high amenity, cultural or scientific value, in particular the North York Moors National Park;
- Areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas are avoided;
- Locating the converter stations within the Wilton Complex, within agricultural land to the north of the A174, was considered to make good use of existing screening afforded by bunds, woodland planting, hedgerows along the A174 to the south in order to reduce visual impacts from Wilton and the A174 to the south and east, from Lazenby to the southwest and from Lackenby and Eston to the west;
- The co-location of two converter stations aimed to reduce the landscape and visual impacts associated with two separate locations which could potentially have more extensive impacts;
- Locations for buildings and structures associated with the converter stations were sought to take advantage of the screening provided by land form and existing features and to seek to use the potential of a site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum; and
- The height of the converter stations was reduced as much as practicably possible in order to reduce the potential for visual impacts. Building heights of up to 30m were proposed within the Scoping Report, but following more detailed site selection studies and consultation, a reduction in height was agreed (to a maximum height of 20m). Buildings of a lower height, but of consequently larger footprint were therefore proposed, as an alternative to taller buildings with a smaller footprint.

Potential Impacts

Impacts on Landscape Character and Resources During Operation

Landscape Character and Resources of the Site

7.9 The landscape of the site, which comprises a large scale agricultural field, is considered to be of low sensitivity. More sensitive features include a large block of woodland to the east, which comprise mature deciduous trees. Tall palisade fencing at the perimeter of the site, lighting in the adjacent area to the north and the movement of vehicles within the Wilton Complex contribute to the general perception of a highly modified landscape that is busy and complex in nature. As described in **Section 4** of this report, in the context of the adjacent development to the north, the landscape sensitivity of the landscape resource is considered low.

7.10 Both operating scenarios will give rise to long term (25 years for Scenario I and up to 30 years for Scenario II) direct impacts on the resources and character of the site and the immediate local landscape as a result of the change of the landscape within part of the site from agricultural land to converter stations.

7.11 Direct impacts on landscape resources and character of the site resulting from operating Scenario I will be proportionally less extensive than Scenario II, although the nature of impacts will be broadly similar, as the presence of operational access roads and change of the agricultural field to one or two converter stations is common to all three.

7.12 The magnitude of change in Operating Scenarios I and II is considered to be **medium**. Overall, the impact will be of locally **moderate** significance across the site itself during operation.

Impacts on Landscape Character

Wilton Complex LCU (W1)

7.13 Impacts on this LCU will result primarily from the visibility of the converter stations, as there will be limited impacts on the fabric of the landscape unit beyond the site. The operation of the converter stations in both scenarios will introduce large developments into the periphery of a highly modified landscape, strongly influenced by large industrial structures and several large overhead power lines. Impacts will be long term, with operation expected to last for a period of 25 years for Scenario I and up to 30 years for Scenario II before decommissioning. The introduction of the proposed development will intensify the influence of these man-made features on the character of the landscape and locally reduce the extent of undeveloped areas which are currently used for agriculture.

7.14 The change in landscape character of the LCU as a result of the proposed development in both scenarios will be will be localised (up to approximately 1km from the site), long term and of a **low** magnitude overall.

7.15 Impacts on LCUs within the surrounding area are summarised in **Table 7.1**.

Table 7.1 Potential operational impacts on landscape character and resources

Landscape receptor	Sensitivity of receptor	Magnitude of change (extent, duration, reversibility)	Level of impact
Landscape character and resources of the site			
Landscape character and resources of the site and immediate surroundings (adjacent areas of farmland to the south and west, woodland to the east and adjacent parcels of land within the Wilton Complex to the north)	**Low**	***Scenario I and II*** **Medium** Change will be of a medium magnitude locally, long term and reversible.	**Moderate**
Landscape character			
LCU W1 Wilton Complex	**Low**	***Scenario I and II*** **Low** Change will be localised, long-term (approximately 25 years).	**Minor**
LCU R1 Urbanised Farmland (East of Wilton)	**Low**	***Scenario I and II*** **Negligible** There will be limited visibility of the development from within this character unit due to the presence of a shelter belt to the east of the area.	**Negligible**
LCU E1 Upland (Eston Hills/Eston Moor)	**High**	***Scenario I and II*** **Negligible** The development will give rise to impacts on a small area of the LCU, where elevated views	**Negligible**

Landscape receptor	Sensitivity of receptor	Magnitude of change (extent, duration, reversibility)	Level of impact
		over the site are available from the northern extent. It will introduce a further area of development into the panoramic views available from Eston Nab and at the top of the escarpment, but is will form a minor feature set within the context of extensive industrial development that dominates the character of the landscape to the north of the LCU. Overall the magnitude of change will be negligible.	
LCU E2 Escarpment (Eston Hills)	**High**	***Scenario I and II*** **Negligible** There will be limited, impacts on this LCU arising from the visibility of the development from open areas within the east of the area which overlook the Wilton Complex. The upper parts of the converter station(s) will be visible above woodland to the north. It will introduce a further area of development but within the context of the existing industrialised character of the area to the north of the LCU, overall the magnitude of change will be negligible.	**Negligible**
LCU E3 Parkland (Wilton)	**High**	***Scenario I and II*** **Negligible** Visibility of the development will be very limited within this character unit due to the presence of a woodland and shelter belts to the north of the area.	**Negligible**

Visual Impacts during Operation

Residential Receptors

7.16 Views will be visible from limited areas at the north eastern edge of Lazenby (represented by **Viewpoint 1**). Where views to the northeast are available, the upper parts of a single (Operating Scenario I and II) or two converter halls positioned side by side (Operating Scenario III) will be visible framed by the bunds to the northeast, viewed at close-range. The change will be viewed in the context of the existing stacks and cooling tower within the Wilton Complex.

7.17 For residential receptors at the north eastern edge of Lazenby, the magnitude of visual change in both scenarios is considered to be medium and the level of impact **moderate**.

7.18 The development in both scenarios will not be visible from the remainder of the village. The magnitude of visual change within the wider settlement of Lazenby, to the south and west, will therefore be negligible, and the level of impact **negligible**.

7.19 In views from the south eastern edge of Lackenby (at the south eastern edge of Eston, represented by **Viewpoint 6**), upper parts of the converter hall(s) will be visible, with lower parts screened by vegetation surrounding Lazenby and following the A1053. The development will be viewed in the context of the Wilton Complex and network of overhead power lines, and the magnitude of change will be low. Overall the magnitude of visual change within residential areas at the eastern extent of Eston will be negligible and the overall impact **negligible**.

Recreational Receptors

7.20 Views will be available of the upper parts of the northern extent of the converter station(s) in both scenarios from a short section of Pasture Lane to the north (represented by **Viewpoint 2**). From much of the track, views will be screened by bunding, tree planting and vegetation lining the track. Where open views are available from the track, the magnitude of change will be low and the level of impact **minor**.

7.21 Views of the upper parts of the converter hall(s) will be available from the PRoWs crossing Lazenby Bank where open views to the north are available (represented by **Viewpoint 4**). Lower parts of the development, including the AC switch yard(s) are likely to be screened by vegetation and woodland to the south of the site. The development will be viewed in relation to the Wilton Complex, the existing cooling towers, stacks and chimneys within it, as well as the wider industrial context of the Tees Valley. Overall the magnitude of change in views from Lazenby Bank will be low and the level of impact **minor**.

7.22 Elevated views over the site and of the entirety of the development will be available from Eston Nab and the PRoWs that follow the ridgeline at the top of the escarpment of the Eston Hills (represented by **Viewpoint 7**), in both scenarios. The converter station(s) will be visible as a further developed area at the southern extent of the Wilton Complex, set within the context of the stacks, chimneys and industrial development that extend to the north and west. The development will be a small element within a wide panorama available from the PRoWs, which includes extensive industrial development, roads and other infrastructure. Overall the magnitude of change will be low and the level of impact **minor**.

Impacts on Views at Viewpoints

7.23 An evaluation of levels of impact on views and visual amenity from viewpoints is presented in **Table 7.2**.

Table 7.2 Potential operational impacts on views at assessment viewpoints

Viewpoint	Receptor and sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of impact
Viewpoint 1: Lazenby, northern edge	H High	***Scenario I and Scenario II*** Open views of the converter station(s), including the converter hall(s) will be available to the northeast, framed by the ends of grassed bunds to the east and north of the viewpoint. Lower parts of the converter hall and AC switch yard within the northern extent of the sites will be screened by the existing bund to the north. The converter hall will be set in front of a large block of mature deciduous woodland and will partly screen several stacks and cooling towers located on the skyline in this direction. The development will introduce a large scale feature, into the agricultural farmland that currently forms the foreground to views of the Wilton Complex. The magnitude of change will be **medium**.	**Moderate**
Viewpoint 2: Pasture Lane, Lazenby	R Medium	***Scenario I*** A small part of the upper northern end of the AC yard will be visible at close range in the field to the east. Surrounding fencing at the western and northern extent of the site will also be visible. The converter hall, the control building and most of the AC yard (including ground-level structures) will be screened by the existing bund to the southeast. Existing stacks, cooling towers and large buildings within the Wilton Complex will be visible to the left of the view, which is already a complex skyline dominated by industrial development. The magnitude of change will be **low**. ***Scenario II*** Small parts of the taller elements within the AC yards of both converter stations will be visible at close range in the field to the east. Surrounding fencing at the western and northern extent of the site will also be visible. The converter halls, the control buildings and most of the AC yards (including ground-level structures) will be screened by the bunds to the southeast. Existing stacks, cooling towers and large buildings within the Wilton Complex will be visible to the left of the view, which forms an existing skyline dominated by industrial development. The magnitude of change will be **low**.	**Minor**

Viewpoint 3: Wilton Castle, Wilton	H, R High	***Scenario I and Scenario II*** There will be no noticeable view of the converter halls from this area because of screening by trees. The magnitude of change will be **negligible**.	**Negligible**
Viewpoint 4: Lazenby Bank	R Medium	***Scenario I and Scenario II*** The converter station(s) will be visible through foreground vegetation to the northeast within an agricultural area between Lazenby and the Wilton Complex. The upper parts of the converter halls will be visible above a woodland belt to the southwest of the site, with lower parts, including AC switch yard(s), largely screened by vegetation. In summer months when the trees are in leaf, the converter station(s) will be largely screened. In both scenarios, the works will be viewed in the context of the complex skyline, dominated by industrial development to the north. The introduction of the development will form a further feature to the south of the Wilton Complex, but will form a minor element within the wider setting of the view and in relation to the scale of the existing infrastructure visible from this location. The magnitude of change will be **negligible.**	**Minor**
Viewpoint 5: A1042, southwest of Kirkleatham	T, R Medium	***Scenario I and Scenario II*** During summer months the converter hall(s) will be barely discernible from this location, due to the intervening tree belt at the eastern edge of the Wilton Complex. During winter months the converter hall(s) will be visible through the tree belt which will filter views when vegetation is not in leaf. The development will appear as part of the Wilton Complex, extending the presence of buildings and structures further south in the view. The development will appear relatively smaller in scale than the cooling towers and existing stacks visible to the west. The magnitude of change will be **negligible**.	**Negligible**
Viewpoint 6: South Lakenby	H, T, R High	***Scenario I and Scenario II*** The roof and upper parts of the converter hall(s) and taller elements within the AC switch yard(s) will be visible to the east, visible above intervening vegetation to the west of the site and woodland surrounding Lazenby. The development will be set in front of several tall stacks and cooling towers and viewed in the context of the lines of overhead power lines which further contribute to a complex skyline to the east. The development will appear as part of the infrastructure already present within the Wilton Complex and its introduction in both scenarios, although perceptible, will form a minor additional component within an extensive area of industrial development. The magnitude of change will be **negligible**.	**Negligible**
Viewpoint 7:	R	***Scenario I***	**Minor**

Eston Beacon, Eston Nab	High	Views from this elevated viewpoint extend over the industrialised Tees Valley to the coast. The converter station will introduce a further developed area at the southern extent of the Wilton Complex, within an agricultural field with blocks of woodland dispersed around it. Within the context of the large buildings, stacks, chimneys and industrial development that extend to the north and west, the development will be a small element within this wide panorama. The magnitude of change will be **low**. ***Scenario II*** The two converter stations will form a large development within the Wilton Complex to the northeast, appearing adjacent to a substantial area of industrial development. The development will not be out of scale with other industrial features in the landscape and affect a small part of the broad view available from this location. The magnitude of change will be **low**.	

Proposed Mitigation

7.24 The following text summarises the proposed long term landscape mitigation and enhancement measures, comprising the introduction of an area of bunding and planting, outside the converter stations site. These proposals will be developed as part of the detailed landscape design, in discussion with the landowners and agreement with RCBC. The following text sets out the key principles that the detailed mitigation proposals will follow.

7.25 An Indicative Landscape Mitigation Plan is presented in **Figure 7.1**. This has been developed based on initial site appraisals, desk-top studies, field visits and consultation with the local authority and the local community of Lazenby.

7.26 Space for landscaping will be ensured within the vicinity of the converter stations based on this Indicative Mitigation Plan and a Detailed Landscape Design will be prepared as part of an iterative process with the engineers, landscape architects, and in consultation with RCBC and Natural England. Ecological mitigation and restoration measures are described in **Chapter 25** of the ES. These will be incorporated into the CEMP and Contract Documents as appropriate.

7.27 The following mitigation measures will be implemented on-site:

- The extension of two existing landscaped bunds to the northeast of Lazenby, so that the bunding overlaps and appears to visually link in order to screen the views available between the existing bunds towards the development site;
- Native woodland vegetation will be planted on the top of the new bunding, to tie in with existing woodland on the existing bunds, with the aim of providing extra screening from the settlement edge in the long term, and to reduce visual impacts on the wider area;
- Permanent lighting will be designed to minimise glare and light spillage off-site, to the sky and to adjacent areas (particularly residential properties close to the site);
- Perimeter fencing will be positioned so that it is screened behind proposed planting; and
- Management of the landscape and habitats during the years of operation will be agreed in consultation with RCBC. This will include measures to maintain and enhance the landscape and visual amenity of the area, and to encourage ecological interest through habitat management.

7.28 These mitigation proposals are shown on **Figure 7.1** Indicative Landscape Mitigation Plan. The final scheme, combining the landscape and drainage proposals will be agreed with the local planning authority before construction.

Residual Impacts

Impacts on Landscape Character and Resources during Operation

Landscape Character and Resources of the Site

7.29 By year 10, the area within the site will be changed from agricultural land to converter stations, with a further area to the southwest of the site being modified to include areas of young woodland on gently landscaped earth bunds.

7.30 The magnitude of change in Operating Scenarios I and II is considered to be **medium** in year 10, affecting an area of low sensitivity. Overall, the residual impact will be of locally **minor** significance across the site itself during operation. In wider scale context (national/regional), the residual impacts will be **negligible**.

Landscape Character and Resources of the Study Area

7.31 By year 10, the additional planting to the southwest of the converter stations will be well established. This will result in a small beneficial change to the area immediately surrounding the site, although overall it will give rise to very limited change to the landscape character of Character Unit W1 Wilton Complex.

7.32 The residual change in landscape character of the Character Unit W1 Wilton Complex as a result of the presence of the converter stations in both scenarios will be direct, localised, long term and of a low magnitude overall. Residual impacts by year 10 will be **minor** for both scenarios.

7.33 The development, as viewed from within the wider character units to the south and west, will appear to be set within woodland, and the additional mitigation planting will blend into the existing vegetation which fringes the site when viewed from the west. Residual impacts on these units by year 10 will be as reported above in year one.

Table 7.3 Summary of residual operational impacts on landscape character and resources

Landscape receptor	Sensitivity of receptor	Magnitude of change (extent, duration, reversibility)	Residual level of impact (year 1)	Residual level of impact (year 10)
Landscape character and resources				
Landscape character and resources of the site and immediate surroundings	**Low**	***Scenario I & II*** **Medium** (Localised, long term, reversible)	**Moderate**	**Minor**
Landscape character				
LCU W1 Wilton Complex	**Low**	***Scenario I & II*** **Low** Change will be localised, long-term (approximately 25 years), with the magnitude reducing over time as new planting becomes established.	**Minor**	**Minor**

Residual Visual Impacts During Operation

Operating Scenarios I and II

7.34 The landscaped bund located to the southwest of the site will screen ground level views of the converter halls and AC switch yards from the north-eastern edge of Lazenby (as represented by **Viewpoint 1**). The residual impacts resulting from the change in view (whereby close-range views of grassed bunds, with woodland planting, will replace the longer views across farmland towards the Wilton Complex) will be of a moderate level, but neutral. Views of the development from upper windows of the properties on the north-eastern edge of Lazenby are likely to be available over the bunds, but will become increasingly filtered by vegetation as the woodland planted on the bunds grows to maturity.

7.35 From areas to the northwest of the site, the establishment of new areas of bunding and associated mitigation planting will not affect views, as views are already screened by the existing bunding and areas of woodland north of Lazenby. From the north, within the Wilton Complex, visibility of the converter stations will remain the same as at year 1. From areas where more elevated views over the site are available, such as the open areas of the escarpment and Eston Hills to the south, the planting will help integrate the development into the landscape, but will not notably reduce the visibility of the converter stations overall.

Residential Receptors

7.36 The bunding to the southwest of the site will screen views of the converter halls and AC switch yards in low-level views from the north-eastern edge of Lazenby. The upper parts of the converter stations and lightning rods may remain visible above the bunds. Views from upper

storeys of houses would look across the bunds to the converter stations beyond, although these will become increasingly filtered as woodland planting matures.

Impacts on Views and Visual Amenity at Viewpoints

7.37 An evaluation of levels of impact on views and visual amenity from viewpoints is presented in **Table 7.4**.

Table 7.4 Residual operational impacts on views at assessment viewpoints

Viewpoint	Receptor and Sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of potential impact	Level of residual impact
Viewpoint 1: Lazenby, northern edge	H High	***Scenario I and Scenario II*** The extension of areas of existing bunding and woodland planting to the northeast of Lazenby, will restrict views from this location. The depth of view will change, with close-range views of grassed bunds, with woodland planting, replacing longer views across farmland towards the Wilton Complex. Views of the converter station(s) and the infrastructure within the Wilton Complex will be screened at ground-level by the bunds immediately to the northeast of the viewpoint. In elevated views from upper storey windows, views over the bunds will be increasingly filtered by woodland planting as it matures. The planting will also increasingly filter views of taller components such as lightening rods which would otherwise be visible above the bunds from lower levels. The magnitude of change will be **medium,** giving rise to a neutral rather than adverse residual impact, of a moderate level.	**Moderate (adverse)**	**Moderate (neutral)**
Viewpoint 2: Pasture Lane, Lazenby	R Medium	***Scenario I and Scenario II*** There will be no change in the view as a result of the introduction of bunds and planting from this location, due to screening by existing bunds to the east and southeast. The upper components of the northern part of the converter station(s) will remain visible in the view. The magnitude of change will remain **negligible**.	**Minor**	**Minor**
Viewpoint 3:	H, R High	***Scenario I and Scenario II*** There will be no noticeable change in	**Negligible**	**Negligible**

Viewpoint	Receptor and Sensitivity (H: Residential, R: Recreational, T: Travelling)	Magnitude of change	Level of potential impact	Level of residual impact
Wilton Castle, Wilton		the view as a result of the converter hall(s), extension of existing bunds or planting from this area, because of screening by trees. The magnitude of change will remain **negligible**.		
Viewpoint 4: Lazenby Bank	R Medium	***Scenario I and Scenario II*** There will be no noticeable change in the view as a result of the converter hall(s), extension of existing bunds or planting from this area because of screening by trees. The magnitude of change will remain **negligible**.	**Minor**	**Minor**
Viewpoint 5: A1042, southwest of Kirkleatham	T, R Medium	***Scenario I and Scenario II*** There will be no noticeable change in the view as a result of the converter hall(s), extension of existing bunds or planting from this area because of screening by trees. The magnitude of change will remain **negligible**.	**Negligible**	**Negligible**
Viewpoint 6: South Lakenby	H, T, R High	***Scenario I and Scenario II*** There will be no noticeable change in the view as a result of the converter hall(s), extension of existing bunds or planting from this area because of screening by trees. The magnitude of change will remain **negligible**.	**Negligible**	**Negligible**
Viewpoint 7: Eston Beacon, Eston Nab	R High	***Scenario I and Scenario II*** The converter station(s) will introduce a further developed area at the southern extent of the Wilton Complex, within an agricultural field with woodland, including the extended existing bunds and planting, around it to the southwest. Within the context of the large buildings, stacks and industrial development that extends to the north and west, the development, extension of existing bunds and planting will be small elements within this wide panorama. The magnitude of change will be **low**.	**Minor**	**Minor**

8 Assessment of Impacts During Decommissioning

Introduction

8.1 This assessment considers the impacts during the decommissioning of the converter stations and the landfall. The assessment of landscape and visual impacts during decommissioning of the HVAC and HVDC cable route has been scoped out, as the cable will remain in situ, except for a short section at the landfall, which is assessed below.

Impacts During Decommissioning

Landfall

8.2 Impacts at the landfall as a result of decommissioning (removal of part the seaward end of the buried cable so that does not become exposed through coastal erosion) are expected to be temporary and short term. The level of landscape and visual change will be of a low magnitude, giving rise to short term minor impacts on a localised area of the beach and on close-range views during the works, reducing to negligible once the works are completed. No mitigation is proposed.

Converter Stations

8.3 During decommissioning there will be short term landscape and visual impact from machinery/equipment and activities on the site including dismantling of plant, demolition of buildings and removal from site. It is assumed that the landscaping will remain in place, and will remain beneficial to landscape and habitats in the long term. The programme for decommissioning of the converter stations is likely to be shorter in duration to the construction phase (approximately 18 - 24 months) and will result in very similar impacts to those reported during construction (the same magnitude and level of impact). However impacts on views from **Viewpoint 1** will be reduced over those reported for the construction stage to negligible, due to the presence of the bunding and maturation of vegetation planted as part of the landscape proposals.

Impacts After Decommissioning

8.4 Short term, temporary impacts anticipated whilst disturbed ground within the site re-vegetates, assuming the implementation of measures to restore the area to agricultural land.

8.5 After decommissioning the only long term impacts will result from the mature landscape planting which will enhance the character and quality of the landscape, and views of the site as compared to the current situation.

9 Inter-relationships

9.1 In order to address the environmental impacts as a whole, this section highlights the potential inter-relationships between landscape and visual receptors and other physical, environmental and human receptors.

9.2 Potential for inter-related impacts are predominantly associated with the linkages between impacts on the landscape and visual amenity with those associated with:

- Land use, soils, drainage, ecology and habitats;
- Archaeology and the historic environment;
- Noise, air quality, lighting, traffic; and
- Access, tourism, recreational and socio-economic interests.

9.3 The EIA highlights these potential inter-relationships to ensure that a holistic account of all potential interactions on any one receptor are captured and understood. For example:

- Impacts upon views may be experienced by recreational users, which may affect tourism and socio-economics;
- A change in view might affect the setting and appreciation of a historic or listed heritage feature;
- Changes in noise, traffic, air quality and lighting can affect the perception and appreciation of landscape character; and
- Changes in landscape resources (disturbance to soils, removal or planting of hedgerows and woodland) could also affect land use, soils, drainage and ecological interests.

9.4 **Table 9.1** summarises the potential inter-relationships that are considered of relevance to landscape and visual receptors and identifies where they have been considered within the ES.

Table 9.1 Inter-relationships

Inter-relationship	Linked chapter
Recreational receptors using PRoWs and related impacts on recreation and tourism	**23 Tourism and recreation**
Residential amenity	**29 Noise** **30 Air Quality**
Impacts on landscape relating to increased traffic activity and site access	**28 Traffic and access**
Impacts on receptors of ecological value such as water courses, hedgerows, trees and woodland Impacts on screening vegetation within and around the site of the converter stations and its value as an ecological receptor	**25 Terrestrial Ecology**
Impacts on the landscape relating to water quality, flooding and impacts on water courses	**24 Geology, Water Resources and Land Quality**
Visual impacts relating to the setting of cultural heritage features	**27 Terrestrial Archaeology**

10 Assessment of Cumulative Impacts

Introduction

10.1 This section describes the cumulative impact assessment (CIA) for landscape and visual impacts. A summary of the CIA is presented in **Chapter 32**.

10.2 Forewind has developed a strategy for the assessment of cumulative impacts in consultation with statutory stakeholders including the Marine Management Organisation (MMO), the Joint Nature Conservation Committee (JNCC), Natural England and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Details of the approach to CIA adopted for this Environmental Statement are provided in **Chapter 4 EIA Process**.

10.3 The strategy recognises that data and information sufficient to undertake an assessment will not be available for all potential projects, activities, plans and/or parameters, and seeks to establish the confidence in the data and other information that is available.

10.4 In its simplest form the strategy involves consideration of whether impacts on a receptor can occur on a cumulative basis between the onshore elements of Dogger Bank Teesside A & B and other activities, projects and plans for which sufficient information regarding location and scale exist.

10.5 The onshore projects, activities and plans relevant to landscape and visual character are presented in **Table 10.1** along with a screening exercise to identify whether there is sufficient confidence to take these forward to the assessment.

10.6 The assessment considers:

- **Cumulative impacts**: additional (or in some cases reduced) impacts which may result if their levels are greater than would result from each individual project alone. It is not an assessment of the total impacts. Additional impacts may arise when other parts of the project, or other projects, are constructed or co-exist concurrently; and
- **Combined impacts:** impacts which may result from separate parts of the project (i.e. onshore and offshore works), when they are occurring at the same time, potentially increasing the overall total magnitude and hence potentially increasing the total impact. They can also result from sequential works associated with separate parts of the project, thus increasing the overall duration of impacts.

Table 10.1 Potential cumulative assessment projects

Project type	Name	Status	Predicted construction date	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Carried forward to CIA
Biomass power station	Tees Renewable Energy Plant	Consented	Expected operational in 2015	3.6km	High	High	No. Very limited potential combined visibility of the project with Dogger Bank Teesside A & B.
Underground cable	Tees Renewable Energy Plant	Consented	2014 - 2015	Intersects with project	High	High	Yes
Pipeline	York Potash Project	Pre-application (due for submission 2013)	Unknown	Intersects with project	Medium	Low	Yes, although limited information available on the details of the project, the cable route is known
Anemometry Mast	Anemometry at the Wilton Centre	Consented	2013-2014	Approximately 30m	High	High	Yes
Container terminal	Northern Gateway Container Terminal	Consented	Unknown	2.7km	Medium	Medium	No. Development is located at some distance from converter stations site with limited potential inter-visibility.
Gas pipeline	Breagh Pipeline	Consented	2013-15	2.9km	Low	Low	No. Development is located at some distance from converter stations site with limited potential inter-visibility.
Housing development	Erection of Two Storey 2, 3 and 4 bedroom dwelling houses and garages, Land Adjoining Mersey Road (Redcar)	Application	Unknown	2.3km	Medium	Medium	No. There will be no combined views of the two developments.

Project type	Name	Status	Predicted construction date	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Carried forward to CIA
Housing redevelopment	Redevelopment comprising the erection of 288 dwellings and ancillary works, the Closes Estate: Land North of Rosebury Road (Redcar)	Application	Unknown	2km	Medium	Medium	No. There will be no combined views of the two developments.
Housing development	Erection of 6 dwellings, Langly Close, Redcar	Consented	Unknown	0.7km (from HVDC Cable Route)	Medium	Medium	No. Development is located within Redcar, with very limited potential inter-visibility.
Demolition of stacks	Teesside Power Station	Permission not required	2012	0.3km	Low	Low	No.
Biomass import facility	Biomass Plant, Teesport, Grangetown	Permission not required	Unknown	3.1km	Medium	N/A (No EIA required)	No. Development is located at some distance from converter stations site to the north, with very limited potential inter-visibility.
Potash processing plant	Screening request for potash processing plant	Pre-application	Unknown	1.8km	Low	Low	No. Sufficient information not available.
Management block	Two storey management block within the Wilton Complex	Consented	2014	0.6km	High	Medium	No. The development will be completed before construction commences for Dogger Bank Teesside A & B. It will form part of the existing baseline of the existing industrial context of the Wilton Complex.
Underground cable	Dogger Bank Teesside	Pre-application	Unknown	Intersects with	Medium	Medium	Yes

Project type	Name	Status	Predicted construction date	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Carried forward to CIA
	Projects C & D			project			
Converter stations	Dogger Bank Teesside C & D	Pre-application	Unknown	Approximately 1km	Medium	Medium	Yes
Agricultural building	Land at Mickle Dales	Consented	Unknown	Intersects with HVDC cable route	High	High	No. No significant impacts resulting from both being constructed at the same time predicted due to the small scale of the building.
Housing development	Marske by the Sea housing development	Outline application	Unknown	0.8km	Medium	Medium	Yes
Single wind turbine	Land at court Green Farm, Wilton Lane, Guisborough	Application	Unknown	2.1km	Medium	Medium	No. There will be very limited visual interaction between the wind farm and the converter station(s) due to the scale of the turbine (up to 51m height to tip) and the intervening topography of the Eston Hills. Visibility of the wind turbines in areas from which the converter station(s) will be seen will be minimal.
Wind Farm	Bankfield Wind Farm	Application	Unknown	2.5km	Medium	Medium	No. There will be very limited visual interaction between the wind farm and the converter station(s) due to the intervening topography of the Eston Hills which limits visibility of the wind turbines in areas from which the converter station(s) will be visible. The turbines will be visible from the coast at the

Project type	Name	Status	Predicted construction date	Distance from Dogger Bank Teesside A & B	Confidence in project details	Confidence in project data	Carried forward to CIA
							landfall and along some sections of the HVDC cable route, but due to the temporary nature of the onshore works and the distance of the turbines, no significant cumulative effects are anticipated.
Two wind turbines	Wilton Wind Turbine Development, at land west of Yearby	Pre-application	Unknown	1km	Medium	Low	No. A scoping request has been submitted for this development but at this stage there is insufficient confidence on project details.
Single wind turbine	Single turbine on land east of Yearby	Application withdrawn	N/a	2km	-	-	No. Application withdrawn.

Assessing Significance of Cumulative Impacts

10.7 Cumulative impacts are assessed on the basis of three stages:

- Prediction of the magnitude of additional impact resulting from the change in the landscape or the view;
- Classification of the sensitivity of the landscape and visual receptors to the proposed development (sensitivity in relation to cumulative impacts will be the same as sensitivity in relation to the stand-alone impacts of the proposed development); and
- Evaluation of the significance of cumulative impact based on the sensitivity of the receptor and the magnitude of impact.

Magnitude of Cumulative Change

10.8 The magnitude of change was assessed by considering the relationship between the other onshore developments taken forward for assessment, and the potential impacts arising from the addition of Dogger Bank Teesside A & B. Assessment takes into account the following:

- The location and arrangement of developments in the view, e.g. developments seen in one direction or part of the view, or seen in all directions;
- The relationship of scale and extent of the developments;
- The potential changes to (or loss of) landscape features and the introduction of new landscape features as a result of the developments; and
- The potential cumulative changes to the character of the landscape, including for example the sense of openness or exposure.

10.9 The magnitude of change is described as high, medium, low or negligible and these definitions are illustrated by the examples in **Table 10.2**.

Table 10.2 Magnitude of change to the landscape and visual resource

	Criteria tending towards higher or lower magnitude of change	
	Higher ⟷	**Lower**
Landscape resource	Large changes or extensive loss of key features Considerable additional changes in the landscapes key characteristics	Small changes to key features, little or no loss of features Small additional changes in the landscapes key characteristics
Visual resource	Notable additional changes in view, which may be visible for a long duration, or which may be in stark contrast with the existing view, or obstruction of a substantial part or important elements of views towards the development area. Substantial changes seen from a viewpoint used to represent a large area Substantial changes viewed over a long section of a route Large proportion of the view affected	Limited perceptible additional changes in views, or visible for a short duration, perhaps at an oblique angle, or which may blend to an extent with the existing view. Changes seen from a unique viewpoint, which is not representative of a wider area Changes viewed over a short section of a route

Significance of Cumulative Impacts

10.10 The level of significance of cumulative impact was judged on the basis of information available with regard to each of the developments, from preliminary ZTVs (where appropriate and where sufficient information was available to model the proposed developments) and fieldwork.

10.11 Overall, the cumulative impact was judged using a multifaceted assessment based on the consideration of potential sensitivity of the receptor, the magnitude of change and the relationships between Dogger Bank Teesside A & B the developments. As for the assessment of the impacts of Dogger Bank Teesside A & B in isolation, four levels of impact are used: **major, moderate, minor** and **negligible**.

Combined Impacts

Onshore and Offshore Works During Construction

10.12 The offshore and onshore works could potentially coincide at the landfall. Offshore and onshore works as a whole will be on going concurrently or will occur in sequence. The combined duration of the works will remain short term.

10.13 Inter-tidal and wider onshore construction activity will be seen concurrently with onshore construction activities for a short period of time in the vicinity of the Redcar Sands, the south-eastern edge of Redcar and the north-western edges of Marske. They may also be discernible from higher areas at the north-western extent of the Eston Hills, including Errington Wood, from which most of the onshore cable route as well as the landfall and inshore waters are visible. Coincident work in the offshore inter-tidal areas and along the onshore HVDC cable route will be experienced as being part of the same overall project, and will be seen in the successive and combined views from the coastal edge and inland. Short term changes in views will be discernible, but a significant cumulative impact upon character is considered unlikely.

10.14 The onshore works will not be seen at the same time as the construction of the offshore wind turbines, as the latter will be so far out at sea. It will not be readily apparent to onshore viewers that the works are part of the same overall project, as they will be widely separated.

10.15 The combined impacts on the landscape and on views arising from the onshore and offshore works will be no greater than those affecting the areas as a consequence of the onshore works when considered in isolation.

10.16 In a regional context, the additional cumulative impacts will be negligible, a result of a low additional magnitude of change.

Onshore and Offshore Works During Operation

10.17 When operational, and once the traces of ground disturbance resulting from construction have blended back into the landscape, the buried inter-tidal works, and the on and offshore cabling will not result in any significant landscape and visual impacts, either individually or in combination. As a consequence no combined impacts will result when considered alongside the operational converter stations.

10.18 The offshore wind turbines and onshore converter stations will be very widely separated. The turbines will be associated with the views from the open sea, whilst the converter stations will be associated with the landscape around Teesside. Different landscapes/seascapes and viewers will be affected by each, and there will be no intervisibility.

10.19 Although both the turbines and converter stations will exist concurrently for between 20 to 30 years, it is not considered that there will be any additional cumulative impacts on landscapes or viewers located between the two, over and above those resulting from the projects in isolation.

Assessment of Cumulative Impacts

Potential Cumulative Impacts During Construction

Tees Renewable Energy Plant Underground Cable

10.20 The Tees Renewable Energy Plant underground electricity cable comprises a single underground cable circuit connecting the Tees REP to Lackenby substation. The cable installation will include both open trench methods and the use of ducts in more built up areas.

10.21 Assuming a worst case whereby Dogger Bank Teesside A & B and the Tees Renewable Energy Plant underground cable were being constructed at the same time, there will be a concentration of construction activity to the North of Lackenby, between the existing NGET substation at Lackenby and the A1053. The HVAC cable route will intersect with the Tees Renewable Energy Plant underground cable within the large, open fields to the west of the A1053. This will include construction compounds, vehicles, stockpiling of materials, and machinery. It is likely that the construction works for both projects will be lit.

10.22 The extent of construction works across the landscape will remain relatively contained within a urban-fringe landscape which is of low sensitivity. There will be some localised direct cumulative impacts on the fields within which the works are taking place, but these will be short term in nature, of a low magnitude, giving rise to negligible cumulative impacts. These localised impacts are unlikely to result in impacts on the landscape character of adjacent LCUs.

10.23 There will be additional short term visual change in views experienced by travelling receptors along the A1053 (of low sensitivity), of a low magnitude, giving rise to impacts of minor significance. There will also be short term additional visual change experienced by residential receptors at the eastern edge of Whale Hill, at South Lackenby and Lackenby Lane, of a negligible magnitude overall giving rise to no significant impacts.

10.24 In the longer term both cumulative landscape and visual impacts will reduce to **negligible** as the HVAC cable route will be restored to agricultural fields.

York Potash Pipeline

10.25 At present no application has been submitted for this development. The following information is based on that provided within the scoping report. If the application is submitted this assessment may need revising.

10.26 The proposals comprise a 'closed loop' system for the movement of crushed mineral ore, and based on the information contained within the Scoping Report (submitted to The National Infrastructure Directorate, November 2012) are likely to including the following:

- Two steel pipes of external diameter of 625mm;
- Ore mixing equipment at mine head incorporating step down transformer, mixer/thickener;
- Brine storage tanks;
- Slurry feed tanks;
- Slurry pumps and associated pipework — all sunk below ground in concrete-lined chambers;
- Intermediate monitoring stations/switchhouses;
- Cathodic protection cables and equipment;
- Construction width corridor of land;
- Temporary and permanent access to and from construction corridor;
- Storage areas for construction materials and contractors compounds;

10.27 The existing proposal information indicates that the pipeline route, extending from the minehead to the southwest of Whitby to the plant within the northeast extent of the Wilton Complex will be routed through part of the Dogger Bank Teesside A & B study area. The proposed route within the study area is through the Eston Hills, passing to the south and west of Yearby, intersecting

with the A174 east of Mains Dyke Bridge Roundabout and following parallel to the eastern edge of the Wilton Complex, west of Kirkleatham.

10.28 Assuming a worst case whereby Dogger Bank Teesside A & B and the York Potash Pipeline were being constructed at the same time, there will be a concentration of construction activity within the fields between the southeast of the Wilton Complex and Kirkleatham, to the north and south of the A174 and northwest of Yearby. The HVAC cable route will intersect with the pipeline within the large, open fields to the southeast of the Mains Dyke Bridge Roundabout. This is likely to include construction compounds, vehicles, stockpiling of materials, and machinery. It is likely that the construction works for both projects will be lit.

10.29 The extent of construction works across the landscape will give rise to localised direct cumulative impacts on the fields within which the works are taking place, but these will be short term in nature. The works will give rise to temporary impacts on the character of a small part of the landscape unit *Redcar flats: Lowland Farmland South of Redcar and Marske* (LCU R2), which is of medium sensitivity. The magnitude of change will be of a medium magnitude, giving rise to moderate cumulative impacts during the construction period. These localised impacts are unlikely to result in impacts on the landscape character of adjacent LCUs.

10.30 There will be an additional short term visual change in views experienced by travelling receptors along the A174 (of low sensitivity), of a high magnitude, giving rise to impacts of moderate significance. There will also be an additional short term visual change experienced by residential receptors at the eastern edge of Yearby, and at the southern edge of Kirkleatham, of a medium magnitude overall giving rise to **moderate** impacts.

10.31 In the medium term both cumulative landscape and visual impacts will reduce to **negligible** as the HVAC cable route will be restored to agricultural fields, which will blend back into the surrounding landscape.

Anemometry Mast at the Wilton Centre

10.32 The proposed development is a consented scheme for a anemometry mast 70m in height, located within the northwest of the Wilton Centre, within 50m of the Dogger Bank Teesside A & B converter stations site.

10.33 Construction of the anemometry mast at the Wilton Centre is likely to be completed before construction for Dogger Bank Teesside A & B commences. As such, construction periods will not coincide, and no cumulative impacts will arise as a consequence of construction of Dogger Bank Teesside A & B together with the anemometry mast.

Marske-by-the-Sea Housing Development

10.34 The proposed development comprises up to 1,000 dwellings and amenities (likely to include neighbourhood centre, recreational and leisure facilities, car parks and a hotel) located to the south of Marske-by-the-Sea, east of Longbeck Road and approximately 0.8km to the east of the HVDC cable route.

10.35 Assuming a worst case whereby Dogger Bank Teesside A & B and the housing development were being constructed at the same time, there will be a concentration of construction activity within the farmland to the south and west of Marske-by-the-sea (south of the railway line).

10.36 There will be an additional short term visual change in views experienced by travelling receptors along the A174 (of low sensitivity) between the southern edge of Redcar and Saltburn-by-the-sea, of a medium magnitude, giving rise to impacts of low significance. There will also be an additional short term visual change experienced by residential receptors located along Longbeck Road to the south of Longbeck Station, where construction of Dogger Bank Teesside A & B will be visible as an further area of activity to the west, although at a greater distance away than the housing development (which will be immediately adjacent to Longbrook Road). The works will give rise to additional visual change of a low magnitude overall giving rise to **moderate** impacts.

10.37 In the medium term both cumulative landscape and visual impacts will reduce to **negligible** as the HVAC cable route will be restored to agricultural fields, which will blend back into the surrounding landscape.

Dogger Bank Teesside C & D Landfall, HVDC Cable Route and Converter Stations

10.38 In outline, the Dogger Bank Teesside C & D onshore development landward of the Mean High Water Mark (MHWM) comprises:

- Cable landfall and HDD compounds;
- Transition bays;
- Two buried onshore High Voltage Direct Current (HVDC) export cable systems, carrying power from the landfall to the onshore converter stations;
- Horizontal Directional Drilling (HDD) under roads, foreshore, railway, watercourses, pipelines and potentially other cables;
- Two onshore converter stations (one per project, which are co-located) with associated access roads, compounds, fencing, landscaping and drainage;
- Two onshore High Voltage Alternating Current (HVAC) export cable systems, carrying power from the onshore converter stations to the existing NGET substation at Lackenby;
- Connection bay within the NGET substation containing isolation switchgear and electrical equipment for connection of the export cable systems to the transmission network;
- Temporary works and laydown areas;
- Permanent and temporary access roads; and
- Service corridors, including telecommunications, water and connection to the local electricity network.

10.39 Dogger Bank Teesside C & D cable route will come onshore to the southeast of Redcar, approximately 0.8km to the north of the Dogger Bank Teesside A & B landfall, where it will pass through agricultural land between Redcar and Marske-by-the-Sea. The route will then follow parallel to that of Dogger Bank Teesside A & B until it reaches the Wilton Complex. The proposed location of the converter stations is a parcel of land within the southeast of the Wilton Complex.

10.40 The following assessment assumes a worst case scenario whereby Dogger Bank Teesside A & B and Dogger Bank Teesside C & D were constructed and/or decommissioned. The two projects may be constructed in sequence, but at this time the potential combined duration of the works is not known. The worst case scenario assumed is that the parameters for the Dogger Bank Teesside C & D landfall, HVDC and HVAC cable route and converter stations are as those for Dogger Bank Teesside A & B, as defined in **Section 5**.

Cumulative Impacts on Landscape Character and Resources

10.41 Concurrent construction activity will be present at two points along the coastal edge between Redcar and Marske, with a distance of approximately 0.8km between them. The activities will give rise to short term change, reducing to negligible in the long term as restoration works for both projects are carried out.

10.42 Direct temporary impacts on landscape resources and character will result from the concurrent installation of the HVDC cable route for Dogger Bank Teesside A & B and Dogger Bank Teesside C & D. These will be localised in extent and will result in a low additional magnitude of change.

10.43 The extent of additional construction work is likely to lead to some localised significant cumulative visual impacts on the local area between Redcar and Marske, where the two cable routes converge, but these are unlikely to result in impacts on the landscape character of the wider Marske Coastal Farmland and LCUs to the south and west. When considered in a wider context, the additional cumulative impacts on landscape resulting from the construction of Dogger Bank Teesside A & B are not predicted to be significant.

Cumulative Visual Impacts

10.44 There will be combined visibility of construction works associated with the converter stations of the two projects within elevated areas to the south, including Eston Hills. However given the industrialised context of these views, the additional cumulative visual change will be negligible from these vantage points.

10.45 There will be no additional cumulative impacts on residential receptors within Lazenby, as the Dogger Bank Teesside C & D converter stations will be screened by woodland to the east of the Dogger Bank Teesside A & B site.

Potential Cumulative Impacts During Operation

Dogger Bank Teesside C & D Converter Stations

10.46 The following assumes a worst case scenario whereby both converter stations Dogger Bank Teesside A & B and Dogger Bank Teesside C & D were operational at the same time. The same parameters in terms of the scale and nature of Dogger Bank Teesside C & D are assumed as for Dogger Bank Teesside A & B, as set out in **Section 5**.

Cumulative Impacts on Landscape Character and Resources

10.47 The Wilton Complex LCU (W1) will contain both developments, and its character is therefore likely to change to one which is overall slightly more developed, albeit that it already contains significant built development. Built development at present includes major industrial infrastructure, cooling towers and stacks, with considerable influence across the wider landscape. All this is set within a framework of urban fringe development at the foot of the Eston Hills escarpment and Teesport and Middlesbrough to the north.

10.48 Direct long term additional cumulative impacts on landscape resources and character of the Wilton Complex landscape unit (LCU W1) will result from the concurrent operation of four converter stations within agricultural fields to the south of the Wilton Complex. These will be of a low magnitude, affecting an industrial landscape of low sensitivity, giving rise to **negligible** cumulative impacts overall.

10.49 The presence of the two developments will therefore not alter the perception of landscape character locally around the developments, and beyond this will have little or no impact on wider landscape character. Localised sequential visual impacts will not be experienced from the wider landscape, due to the separation of the two projects and the presence of intervening blocks of woodland.

Cumulative Visual Impacts

10.50 In order to inform the assessment of cumulative visual impacts, a preliminary ZTV based on indicative information on the location and size of the converter stations was prepared. The ZTV was overlaid with that of the Dogger Bank Teesside A & B converter stations to provide an indication of areas from which Dogger Bank Teesside C & D will potentially be visible. These draft ZTVs together with and field work undertaken allowed the following observations to be made.

10.51 The areas from which both Dogger Bank Teesside A & B and Dogger Bank Teesside C & D converter stations will be visible are very limited. There will be combined visibility of the converter stations of the two projects within elevated areas to the south, including:

- **Viewpoint 4: Lazenby Bank**; and
- **Viewpoint 7**: **Eston Nab** and an area at the northern edge of the Eston Hills.

10.52 The additional cumulative visual change experienced by recreational receptors at these vantage points will be negligible, given the extensive industrialised context of the surrounding landscape to the north.

10.53 There will be no combined visibility of the Dogger Bank Teesside A & B converter stations and Dogger Bank Teesside C & D from the following viewpoints due to the presence of intervening vegetation and buildings:

- **Viewpoint 1: Lazenby, northern edge**;
- **Viewpoint 2: Pasture Lane, north Lazenby**;
- **Viewpoint 5: A1042, southwest of Kirkleatham** (Dogger Bank Teesside C & D is likely to be visible at close range from this viewpoint, but will screen Dogger Bank Teesside A & B); and
- **Viewpoint 6: South Lackenby**.

10.54 There are no predicted impacts arising from Dogger Bank Teesside C & D on travelling receptors on the A174, A1053 and A1042 due to limited visibility of the converter stations. Additional cumulative impacts are therefore not predicted, as no sequential views of the two projects will be available for travelling receptors on these routes.

10.55 There will be no additional cumulative impacts on residential receptors within Lazenby, as the Dogger Bank Teesside C & D converter stations will be screened by woodland to the east of the Dogger Bank Teesside A & B site and the Wilton Centre. Similarly, the Dogger Bank Teesside C & D converter stations will not be visible from Lackenby and therefore no cumulative impacts are predicted on residential receptors.

11 Proposed Monitoring

11.1 Monitoring which is required will include review of the detailed design of the converter stations, including the site access road, valve hall, lighting, and other structures to ensure that their detailed design seeks to reduce impacts upon landscape and views, in line with the mitigation strategy in **Section 6** and **7** of this report.

11.2 Yearly inspection by a landscape architect of the converter stations site and HVDC and HVAC cable routes post construction will be undertaken to ensure mitigation measures, such as the re-planting of hedgerows and the re-vegetation of disturbed ground is successful. This will include snagging and proposals for replanting of failed plants, and other remediation of restoration works where necessary.

11.3 Mitigation measures for construction works, set out in **Section 6** of this report, should be included in a CEMP to be implemented during construction. During the works these measures will be monitored through site visits by a planning officer, and/or an environmental clerk of work acting on behalf of the local planning authority, or employed by the developer.

12 Summary

12.1 The following provides a summary of the key issues and residual significant impacts after mitigation.

Residual Impacts - Construction

Landfall and HVDC cable route

12.2 Measures to reduce landscape and visual impacts are embedded into the design of the cable route and the restoration proposals (see **Section 6** of this report).

12.3 For all three construction scenarios, during the period of construction there will be disturbance to the local landscape arising from construction activity at the landfall and along the HVDC cable route, resulting in a limited number of temporary significant impacts. These will be localised and short or medium-term, occurring during construction works, and for a short period post construction, whilst the disturbed land returns to its original condition, and replacement vegetation which is planted post construction becomes established.

12.4 There will be no significant landscape or visual impacts remaining after restoration works have been completed and once vegetation has regenerated.

Converter stations

12.5 The construction phasing and the timing for the incorporation of mitigation measures are not fully detailed at this time. A worst case is therefore assumed whereby the work associated with the bunding and woodland planting is undertaken at the end of the construction period (Scenario I) or at the end of the construction period for the second converter station (Scenario II), and will therefore not be in place for most of the duration of the construction period.

12.6 During construction of the converter stations (including that of the additional bunding which will help screen them during the latter period of construction) potential landscape and visual impacts will arise as a result of activities and disturbance in the working areas, including erection of hoarding around the construction site, stripping of topsoil, movement of construction vehicles, and associated lighting.

12.7 The construction of the converter stations and additional bunding will give rise to significant visual impacts on residential receptors at the north-eastern extent of Lazenby (represented by Viewpoint 1: Lazenby). From the wider area to the south, west and east, intervening vegetation and buildings within Lazenby will screen views of the works and no significant impacts are predicted.

HVAC cable route and Lackenby substation NGET enabling works

12.8 Measures to reduce landscape and visual impacts have been embedded into the design of the cable route and the restoration proposals (see **Section 6**).

12.9 As with the HVDC cable route, there will be some disturbance to the local landscape arising from construction activity although no significant landscape or visual impacts are predicted as a result. There will be no significant landscape and visual impacts resulting from construction remaining after restoration works have been completed and vegetation has regenerated. Temporary impacts during the construction works will be reduced to negligible once restoration is complete and vegetation has regenerated in the medium term.

Residual Impacts – Operation

Converter stations

12.10 For both operational scenarios, the area which will experience significant landscape and visual impacts is likely to be restricted to the site of the converter stations, the agricultural farmland to the south and southwest, and the edge of the settlement of Lazenby. Impacts will arise from the presence of large man-made structures, and consequent changes to the character of the immediate area.

12.11 Parts of the landscape resource in this area will be changed from agricultural land to converter stations, with a small area being modified, by year 10, to include areas of young woodland, on gently landscaped earth bunds, following implementation of planting during or immediately post construction.

12.12 The character of the wider surrounding landscape to the south is strongly influenced by the presence of the Wilton Complex, overhead power-lines and road infrastructure. The wider landscape will be affected but no significant impacts are anticipated.

12.13 The assessment indicates that significant residual impacts on views will occur, largely as a result of the introduction of extended areas of bunding and partial views of the converter stations available from the north-eastern edge of Lazenby. These will affect the higher sensitivity residential receptors, who have views available to the northeast, and who are located within around 0.8km of the site. The extension of areas of woodland planting in order to screen views more effectively from the upper storeys of properties within Lazenby will reduce these visual impacts over time. By year 10, when trees will have grown to a sufficient size, it is anticipated that there will be no significant residual visual impacts.

12.14 Overall, the proposed development will have some significant residual impacts on landscape and visual receptors, but these will be very localised, will reduce with time, and will be experienced in the context of a landscape where industrial and built development is already strongly characteristic.

Residual Impacts – Decommissioning

Landfall

12.15 There will be short term minor landscape and visual impacts on a localised area of the beach and on close-range views during the works at the landfall, reducing to negligible once the works are completed. No significant impacts are predicted at the landfall after the completion of the works.

Converter stations

12.16 There will be short term landscape and visual impact from machinery/equipment and activities on the site including dismantling of plant, demolition of buildings and removal from site during the decommissioning phase (approximately 18 - 24 months). The landscaping will remain in place, and will remain beneficial to landscape and habitats in the long term. Impacts on views from Viewpoint 1 Lazenby, Northern Edge will be negligible due to the presence of bunding and maturation of vegetation planted as part of the landscape proposals.

12.17 After decommissioning the only long term impacts will result from the mature landscape planting which will enhance the character and quality of the landscape, and views of the site as compared to the current situation.

Cumulative Impacts

12.18 Localised, cumulative impacts will arise from the development of the York Potash Pipeline scheme, should the construction phasing of the two projects overlap. The works will give rise to temporary significant cumulative impacts on the fields within which the works are taking place and the character of a small part of the landscape unit Redcar flats: Lowland Farmland, to the south of

Redcar and Marske (LCU R2). The localised impacts will not result in significant cumulative impacts on the landscape character of adjacent LCUs.

12.19 There will be an additional short term visual change in views experienced by travelling receptors along the A174 in relation to the York Potash Pipeline development, giving rise to significant but short term impacts. There will also be an additional short term visual change experienced by residential receptors at the eastern edge of Yearby, and at the southern edge of Kirkleatham, giving rise to some significant impacts.

12.20 There will be additional short term visual change in views experienced by travelling receptors along the A174 in relation to the housing development south of Marske-by-the-Sea, giving rise to minor short term impacts.

12.21 In the medium term, both cumulative landscape and visual impacts will reduce to negligible as the HVDC cable route will be restored to agricultural fields, which will soon blend back into the surrounding landscape.

12.22 No significant cumulative impacts are predicted during the construction, operation and decommissioning of Dogger Bank Teesside C & D, on the basis of the project details which are currently available.

Table 12.1 Summary of landscape and visual impacts

Impact	Mitigation measures	Residual Impact (Worst Case Scenarios)
Construction Phase		
Impacts on landscape character and resources at the landfall and HVDC Cable Route	Embedded mitigation to reduce impacts on the landscape and views, through the siting and design of the scheme include: • co-locating cable systems within a single cable route; • burying the cable systems rather than using over-head power-lines; • aligning the cable route to avoid the most sensitive landscape and visual features, such as woodland, scrub and water courses; • the use HDD technique at the landfall and to bury the joint transition bay, to reduce long term impacts and limit above ground infrastructure present post-construction; • the use of HDD method of crossing at a number of locations to avoid affecting sensitive landscape features; Construction will follow an agreed CEMP. General mitigation measures and generic best practice working will be employed including: • the retention and protection of identified trees, shrubs and hedges that are considered to be significant in accordance with British Standards Institute (2005): BS 5837:2012 Trees in Relation to Construction; • employing best practice soil handling procedures, including DEFRA (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites- Recommendations; • the conduction of works during daylight hours where possible, and use of construction lighting designed to not impinge into sensitive views, such as close views from bedroom windows of residential properties;. • appropriate hedge species will be replanted along the line of the existing hedge, and managed so as to restore the existing hedgerow where removal of sections of hedgerows are unavoidable; • the progressive restoration of finished areas where appropriate, and so that stored topsoil can be replaced on graded areas when finished; • the creation of naturalistic and sympathetically designed landscape profiles	**Negligible** impacts on all landscape and visual receptors after restoration works have been completed and once vegetation has regenerated.
Visual impacts on residential, recreational and travelling receptors present at the landfall and HVDC Cable Route		

Impact	Mitigation measures	Residual Impact (Worst Case Scenarios)
	once the works are complete; and • the replacing of topsoil, regrading, cultivation and seeding of areas of disturbed earth to blend with the surrounding land form post construction.	
Landscape and resources within the vicinity of the converter stations Visual impacts on residential, recreational and travelling receptors present within the vicinity of the converter stations	Embedded mitigation measures are as for the operational phase. General mitigation measures will be implemented as follows: • temporary hoarding will be erected around the site prior to construction; • works will be conducted during daylight hours where possible and under normal circumstances, under normal circumstances no task lighting will be required during construction; • naturalistic and sympathetically designed bund profiles will be created and native woodland vegetation planting on the top of the bunds, to tie in with woodland planting on the existing bunds; and • all areas of disturbed earth will be cultivated and seeded with appropriate grasses and wild flora.	**Moderate** impacts on views available to residential receptors within the northeast of Lazenby. **Negligible** impacts on all other visual receptors. **Negligible** impacts on all landscape receptors.
Impacts on landscape character and resources within the vicinity of the HVAC Cable Route and the existing NGET substation at Lackenby Visual impacts on residential, recreational and travelling receptors present within the vicinity of the HVAC Cable Route and the existing NGET substation at Lackenby	Embedded mitigation and generic best practice measures as for the HVAC cable route above.	**Negligible** impacts on all landscape and visual receptors after restoration works have been completed and once vegetation has regenerated.

Operational Phase		
Landscape and resources within the vicinity of the converter stations	The key embedded mitigation measures are as follows: • siting the new buildings and components to avoid designated areas of high amenity, cultural or scientific value, in particular the North York Moors National Park; • siting the development to avoid areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources and nature conservation areas; • the co-location of two converter stations; • locating the converter stations within the Wilton Complex, to make good use of existing screening afforded by bunds, woodland planting, hedgerows along the A174 to the south in order to reduce visual impacts from Wilton and the A174 to the south and east, from Lazenby to the southwest and from Lackenby and Eston to the west; • locating the buildings and structures to take advantage of the screening provided by land form and existing features to reduce intrusion into surrounding areas; and • reducing the height of the converter stations as much as possible, from to 30m proposed within the Scoping Report to a maximum height of 20m. Additional mitigation measures include: • the extension of existing landscaped bunds to the east and north of the edge of the settlement Lazenby, in order to screen views available between the existing bunds, towards the development site; • native woodland vegetation planting on the top of the new bunds, to tie in with woodland planting on the existing bunds, with the aim of providing extra screening from the settlement edge in the long term, and to reduce visual impacts on the wider area; • the design of permanent lighting to minimise glare and light spillage off-site, to the sky and to adjacent areas (particularly residential properties close to the site); and • the positioning of perimeter fencing so that it is screened behind the proposed bunds and planting.	**Minor** adverse impacts limited to the local landscape of the site. **Minor** adverse impacts on the character of the character unit W1 Wilton Complex within which the site is located. **Negligible** impacts for all other landscape character units.
Visual impacts on residential, recreational and travelling receptors present within the vicinity of the converter stations		**Moderate neutral** impacts on residential properties at the north-eastern edge of Lazenby. **Minor** adverse impacts on recreational receptors on Pasture Lane and PRoWs on Lazenby Bank and Eston Nab. **Negligible** impacts for all other visual receptors.

13 References

Carl Bro and Golder Associates (2005) Countryside Character of England Volume 1: North East, Character Area 23 Tees Lowland and Character Area 25 North Yorkshire Moors and Cleveland Hills Landscape.

Department of Energy and Climate Change (2011a) Overarching National Policy Statement for Energy (EN-1).

Department of Energy and Climate Change (2011b) National Policy Statement for Renewable Energy Infrastructure (EN-3).

Department of Energy and Climate Change (2011c) National Policy Statement for Electricity Network Infrastructure (EN-5).

Highways Agency, Design Manual for Road and Bridges Volume 11 (2012) http://www.dft.gov.uk/ha/standards/dmrb/.

National Grid Company (NGC) "The Holford Rules" (1993) http://www.nationalgrid.com/NR/rdonlyres/E9E1520A-EB09-4AD7-840B-A114A84677E7/41421/HolfordRules1.pdf.

National Grid Company (NGC) "The Horlock Rules" National Grid Guidance on Siting of Substations http://www.nationalgrid.com/uk/Electricity/MajorProjects/NorthWestCoastConnections/Documents/Index.htm.

National Joint Utilities Group (NJUG) (2007) *NJUG Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees, Issue 2*

Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA) (2002) Guidelines for Landscape and Visual Impact Assessment (GLVIA) Second Edition

Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment (GLVIA) Third Edition.

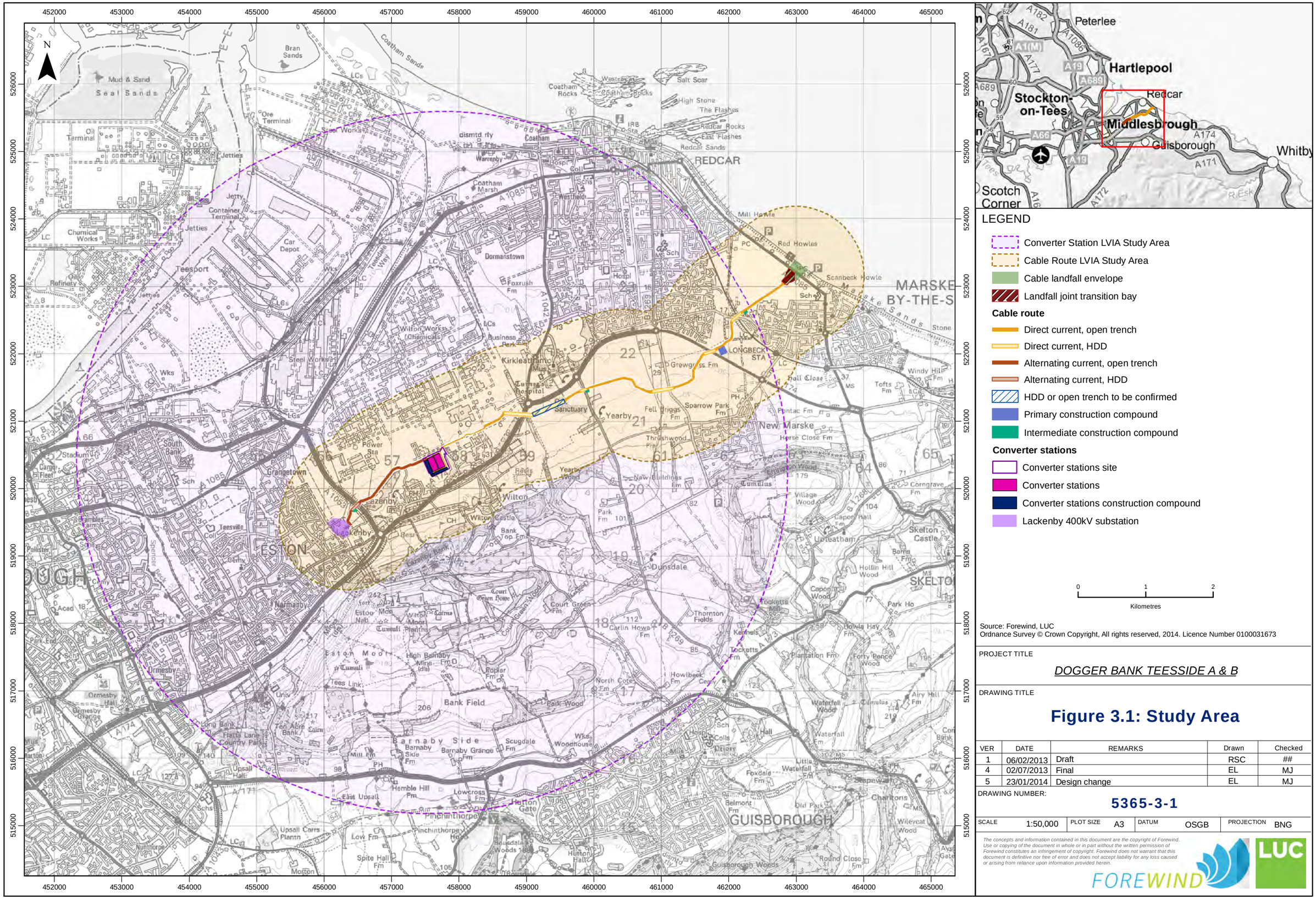
Landscape Institute (2011) Advice Note 01/11 Use of Photography and Photomontage in Landscape and Visual Assessment.

RCBC (2006) Redcar and Cleveland Landscape Character Assessment (Redcar and Cleveland Borough Council (RCBC), April 2006); and

RCBC (2010) Redcar and Cleveland Local Development Framework, Landscape Character SDP

Scottish Natural Heritage (SNH) and the Countryside Agency (2002) Landscape Character Assessment: Guidance for England and Scotland.

Scottish Natural Heritage (SNH) and the Countryside Agency Landscape Character Assessment: Guidance for England and Scotland - Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity.



LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current, open trench
- Direct current, HDD
- Alternating current, open trench
- Alternating current, HDD
- HDD or open trench to be confirmed
- Primary construction compound
- Intermediate construction compound

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation

0 1 2
Kilometres

Source: Forewind, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.1: Study Area

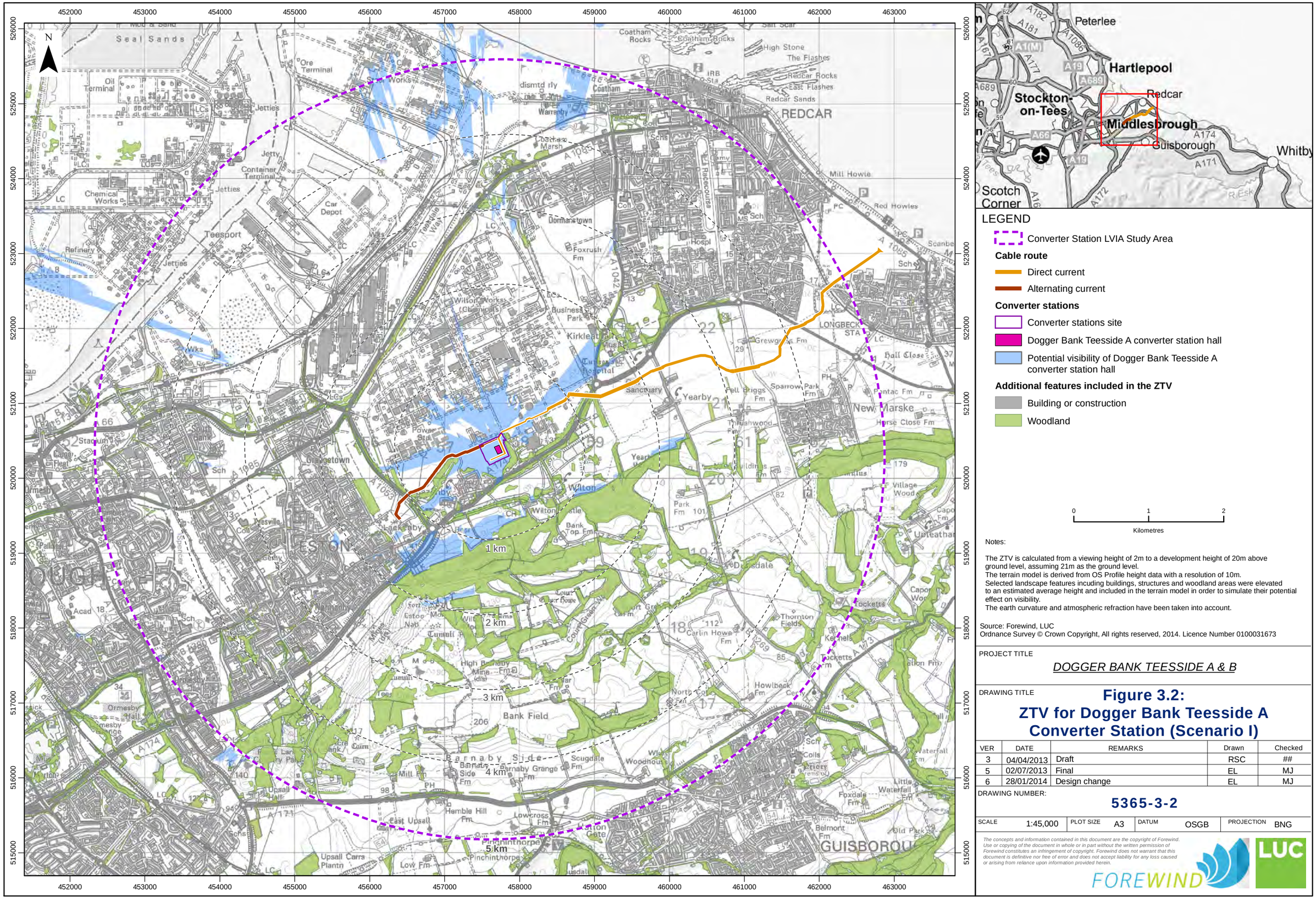
VER	DATE	REMARKS	Drawn	Checked
1	06/02/2013	Draft	RSC	##
4	02/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-3-1

SCALE	1:50,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND LUC



LEGEND

- Converter Station LVIA Study Area

Cable route

- Direct current
- Alternating current

Converter stations

- Converter stations site
- Dogger Bank Teesside A converter station hall
- Potential visibility of Dogger Bank Teesside A converter station hall

Additional features included in the ZTV

- Building or construction
- Woodland

0 1 2

Kilometres

Notes:

The ZTV is calculated from a viewing height of 2m to a development height of 20m above ground level, assuming 21m as the ground level.
The terrain model is derived from OS Profile height data with a resolution of 10m.
Selected landscape features incuding buildings, structures and woodland areas were elevated to an estimated average height and included in the terrain model in order to simulate their potential effect on visibility.
The earth curvature and atmospheric refraction have been taken into account.

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.2:
ZTV for Dogger Bank Teesside A Converter Station (Scenario I)

VER	DATE	REMARKS	Drawn	Checked
3	04/04/2013	Draft	RSC	##
5	02/07/2013	Final	EL	MJ
6	28/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-3-2

SCALE	PLOT SIZE	DATUM	PROJECTION
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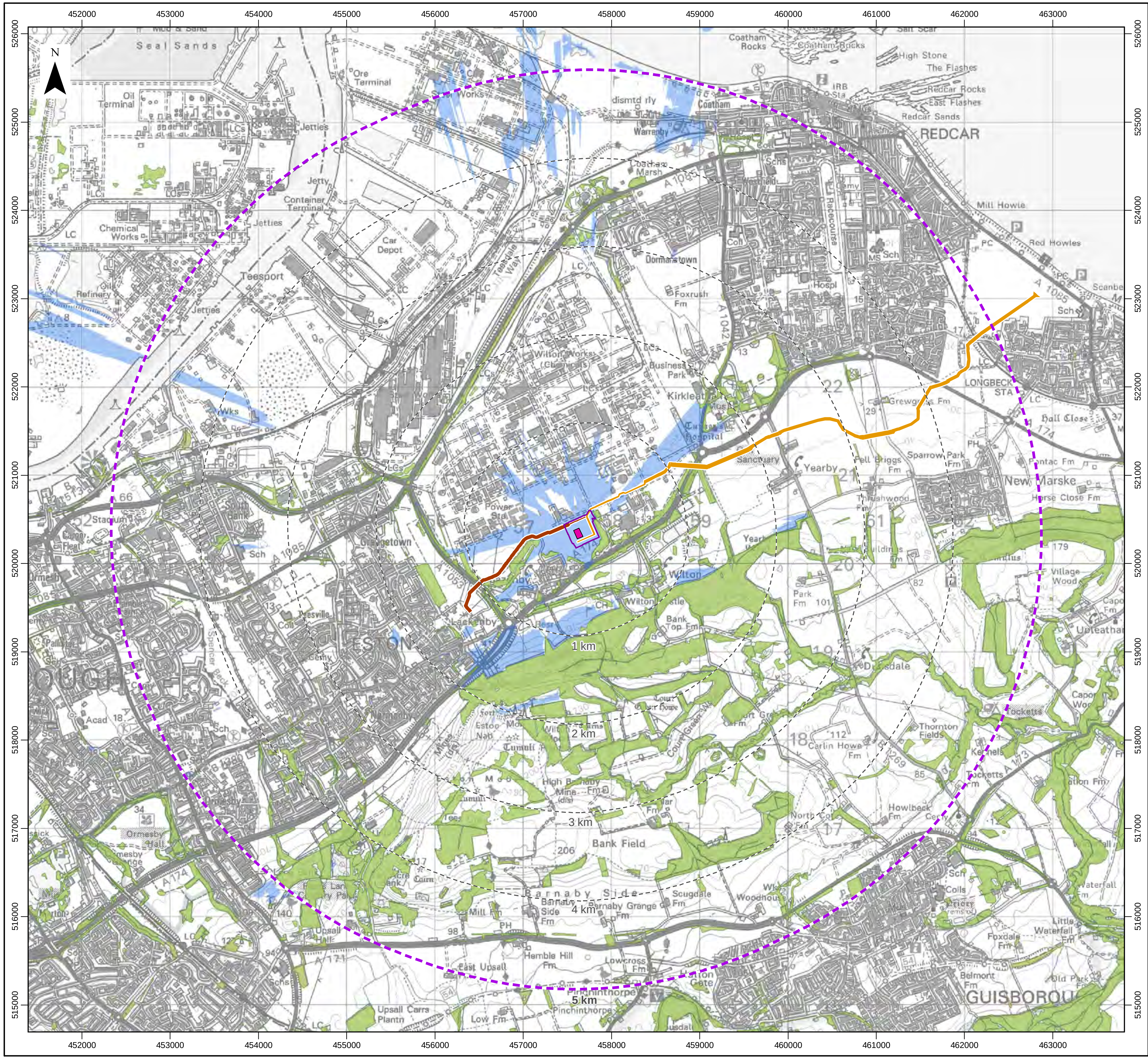

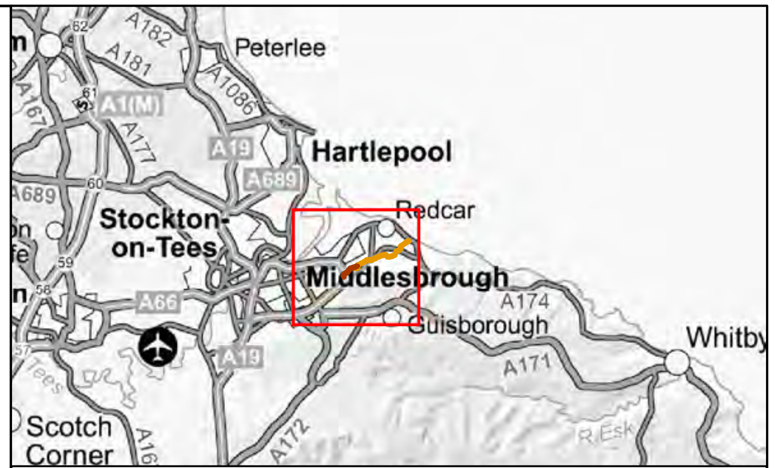

LEGEND

Converter Station LVIA Study Area

Cable route

Direct current

Alternating current

Converter station

Converter stations site

Dogger Bank Teesside B converter station hall

Potential visibility of Dogger Bank Teesside B converter station hall

Additional features included in the ZTV

Building or construction

Woodland

0 1 2

Kilometres

Notes:

The ZTV is calculated from a viewing height of 2m to a development height of 20m above ground level, assuming 21m as the ground level.
The terrain model is derived from OS Profile height data with a resolution of 10m.
Selected landscape features incuding buildings, structures and woodland areas were elevated to an estimated average height and included in the terrain model in order to simulate their potential effect on visibility.
The earth curvature and atmospheric refraction have been taken into account.

Source: Forewind, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.3: ZTV for Dogger Bank Teesside B Converter Station (Scenario I)

VER	DATE	REMARKS	Drawn	Checked
2	19/03/2013	Draft	RSC	##
5	03/07/2013	Final	EL	MJ
6	28/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-3-3

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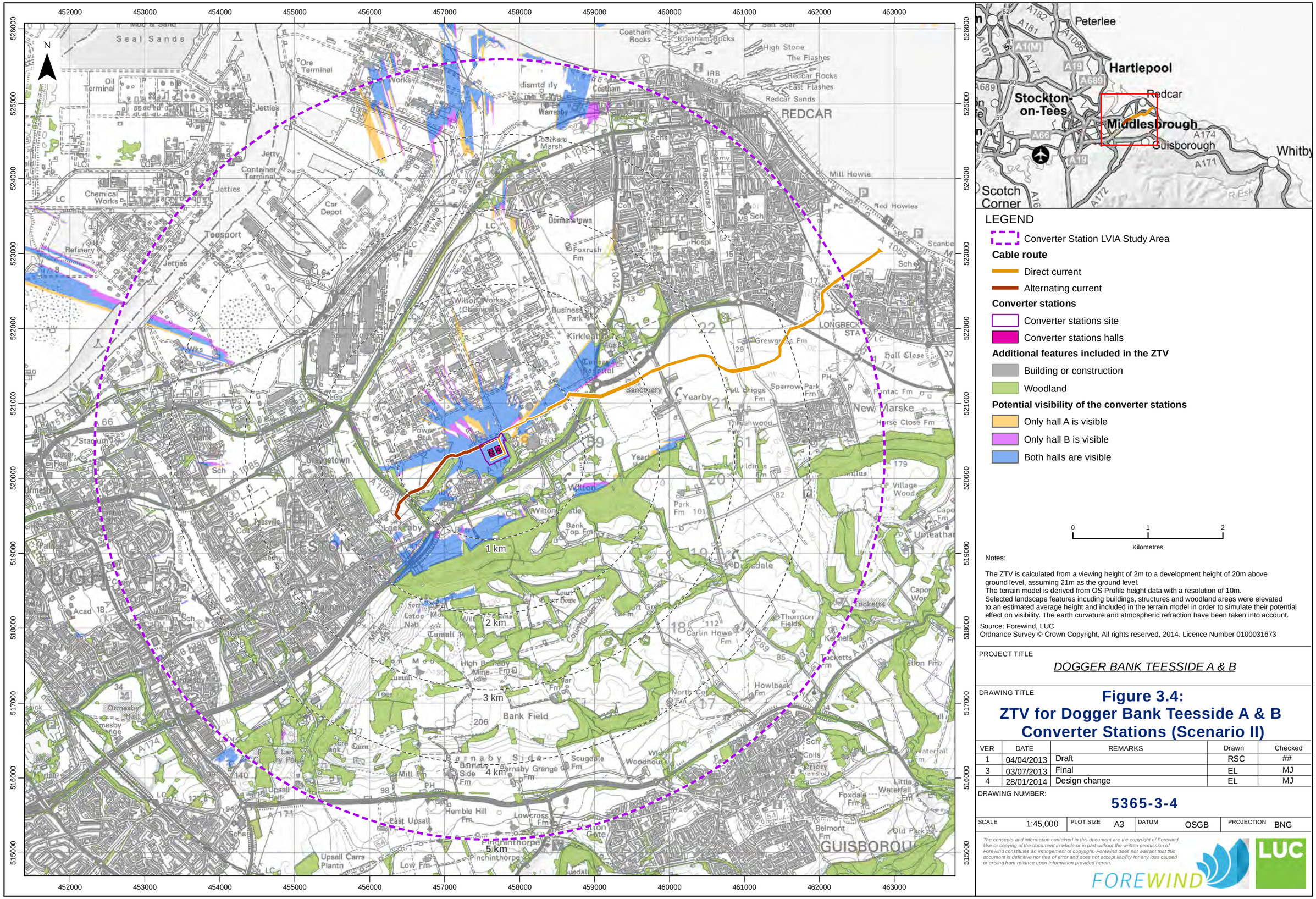
FOREWIND LUC



LEGEND

- Converter Station LVIA Study Area

Cable route

- Direct current
- Alternating current

Converter stations

- Converter stations site
- Converter stations halls

Additional features included in the ZTV

- Building or construction
- Woodland

Potential visibility of the converter stations

- Only hall A is visible
- Only hall B is visible
- Both halls are visible

0 1 2

Kilometres

Notes:

The ZTV is calculated from a viewing height of 2m to a development height of 20m above ground level, assuming 21m as the ground level.
The terrain model is derived from OS Profile height data with a resolution of 10m.
Selected landscape features incuding buildings, structures and woodland areas were elevated to an estimated average height and included in the terrain model in order to simulate their potential effect on visibility. The earth curvature and atmospheric refraction have been taken into account.

Source: Forewind, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 3.4: ZTV for Dogger Bank Teesside A & B Converter Stations (Scenario II)

VER	DATE	REMARKS	Drawn	Checked
1	04/04/2013	Draft	RSC	##
3	03/07/2013	Final	EL	MJ
4	28/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-3-4

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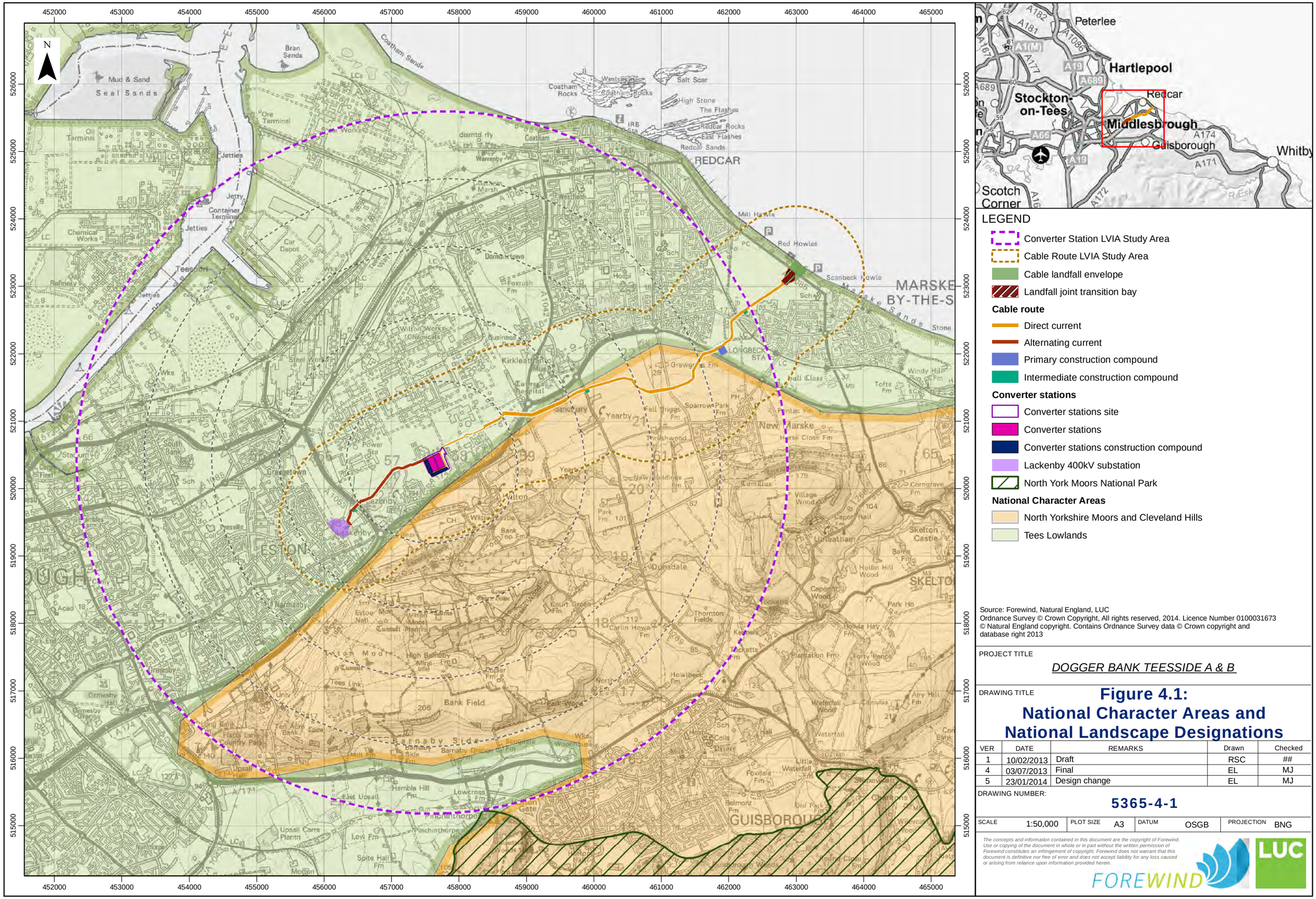
FOREWIND LUC



LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current
- Alternating current
- Primary construction compound
- Intermediate construction compound

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation
- North York Moors National Park

National Character Areas

- North Yorkshire Moors and Cleveland Hills
- Tees Lowlands

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.1: National Character Areas and National Landscape Designations

VER	DATE	REMARKS	Drawn	Checked
1	10/02/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-4-1

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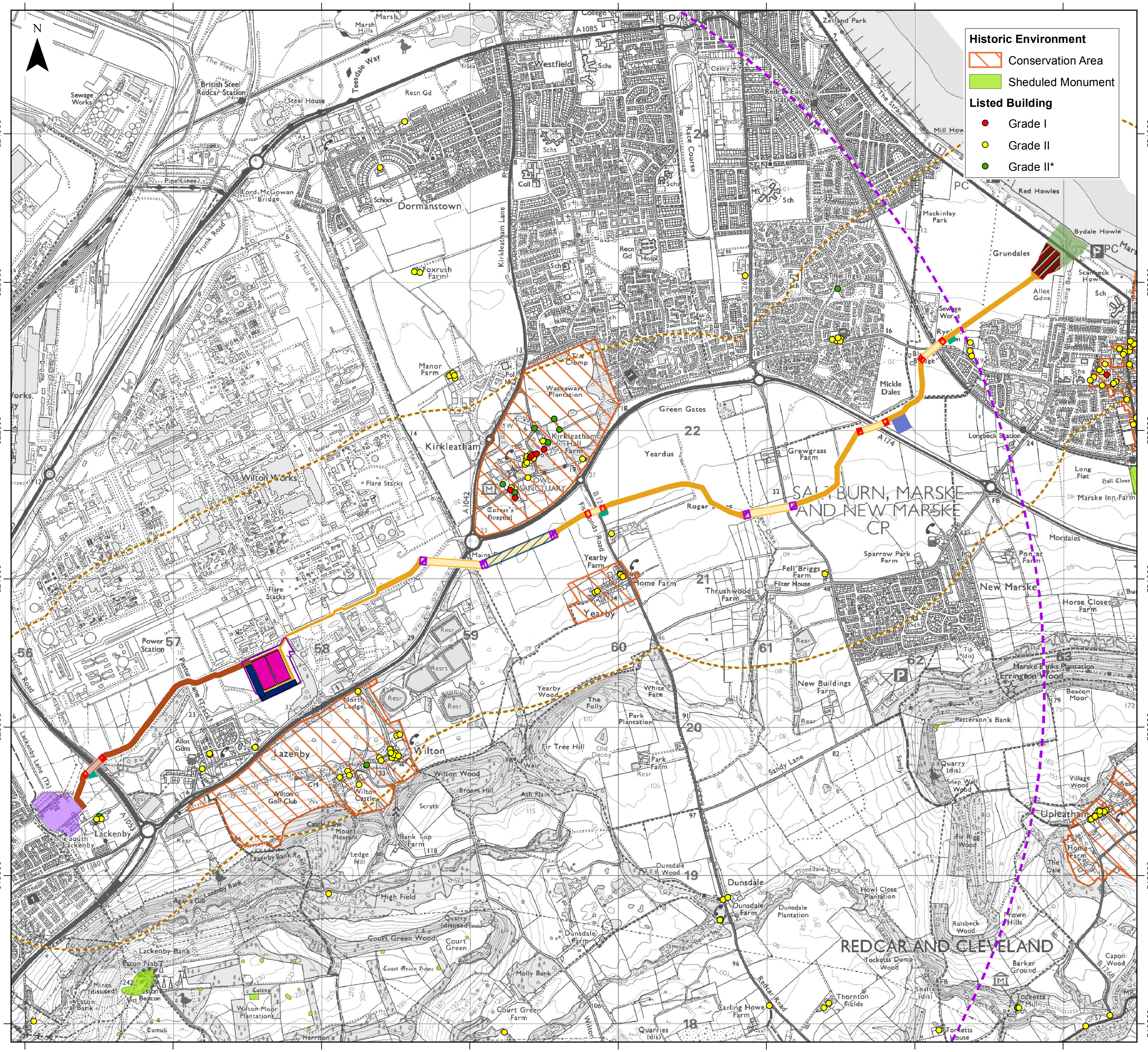

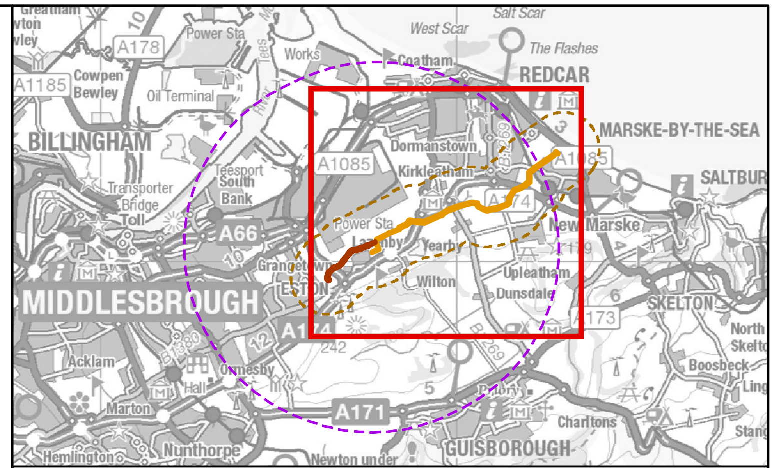

LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current, open trench
- Direct current, HDD
- Alternating current, open trench
- Alternating current, HDD
- Major horizontal directional drill entry or exit locations
- Minor horizontal directional drill entry or exit locations
- HDD or open trench to be confirmed
- Primary construction compound
- Intermediate construction compound

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation

0 0.5 1
Kilometres

Sources: Forewind, Redcar & Cleveland, English Heritage, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.2: Historic Environment

VER	DATE	REMARKS	Drawn	Checked
2	19/03/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
6	23/01/2014	Design change	EL	MJ

DRAWING NUMBER: **5365-4-2**

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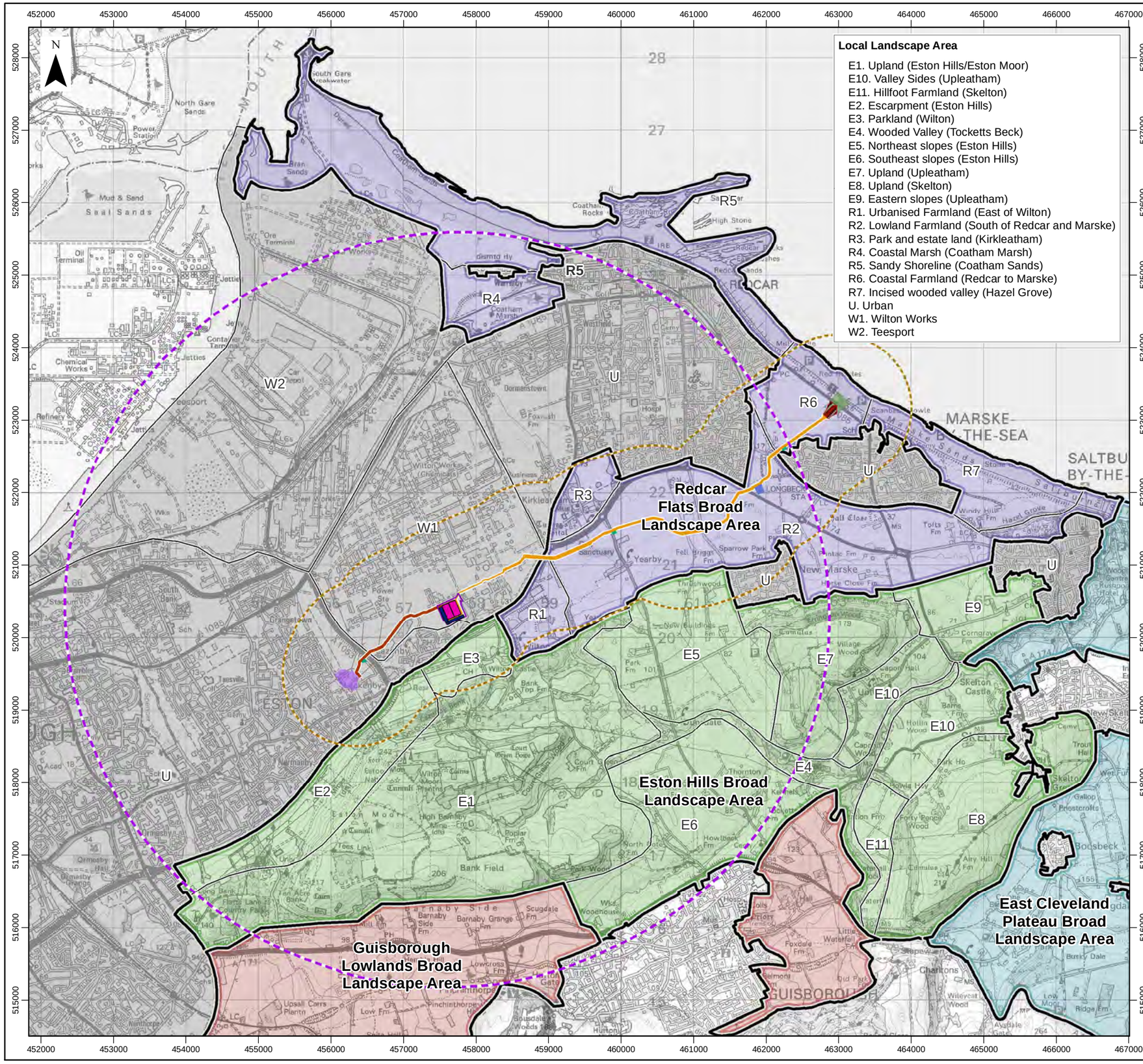
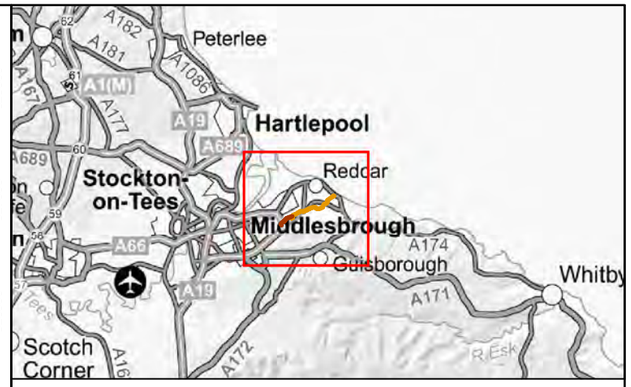




LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current
- Alternating current
- Primary construction compound
- Intermediate construction compound

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation
- Broad Landscape Area
  - Redcar Flats
  - Eston Hills
  - Guisborough Lowlands
  - East Cleveland Plateau
- Local Landscape Area

0 1 2
Kilometres

Sources: Forewind, Redcar & Cleveland, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.3: Local Landscape Character Units

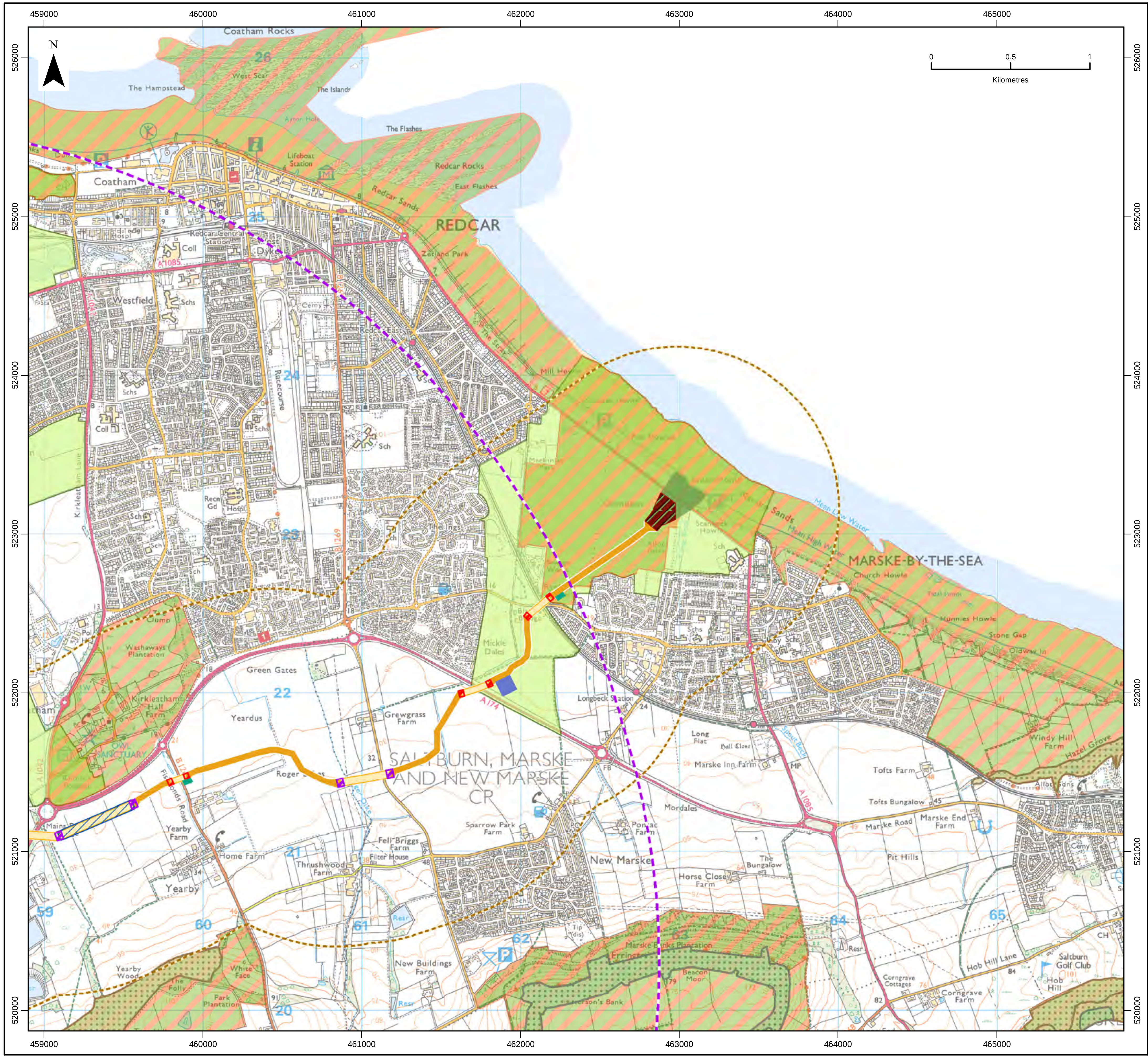
VER	DATE	REMARKS	Drawn	Checked
2	19/03/2013	Draft	RSC	##
5	03/07/2013	Final	EL	MJ
6	23/01/2014	Design change	EL	MJ

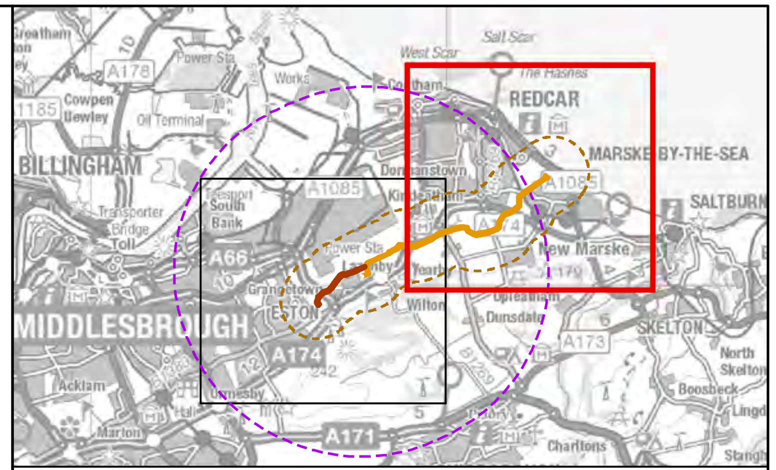
DRAWING NUMBER:

5365-4-3

SCALE	PLOT SIZE	DATUM	PROJECTION
1:55,000	A3	OSGB	BNG

FOREWIND LUC





LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Landfall joint transition bay

Cable route

- Direct current, open trench
- Direct current, HDD
- Alternating current, open trench
- Alternating current, HDD
- HDD or open trench to be confirmed
- Major horizontal directional drill entry or exit locations
- Minor horizontal directional drill entry or exit locations
- Primary construction compound
- Intermediate construction compound

Natural designation

- Ancient & semi-natural woodland
- Ancient replanted woodland

Redcar & Cleveland designations & policies

- Sensitive landscape
- Green infrastructure green wedge

Sources: Forewind, Redcar & Cleveland, LUC

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

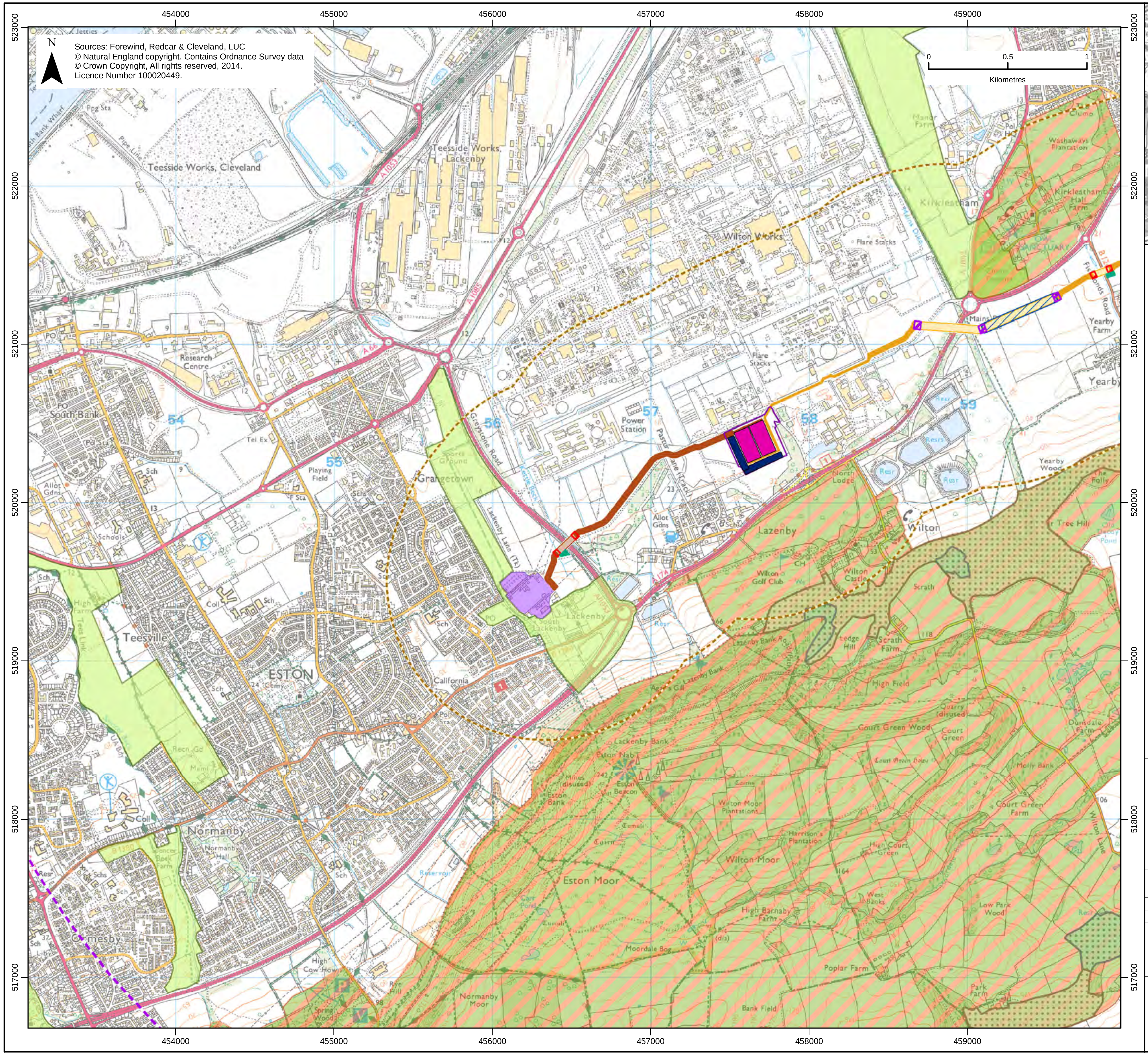
Figure 4.4a: Landscape Resources and Designations (Landfall and Cable Route)

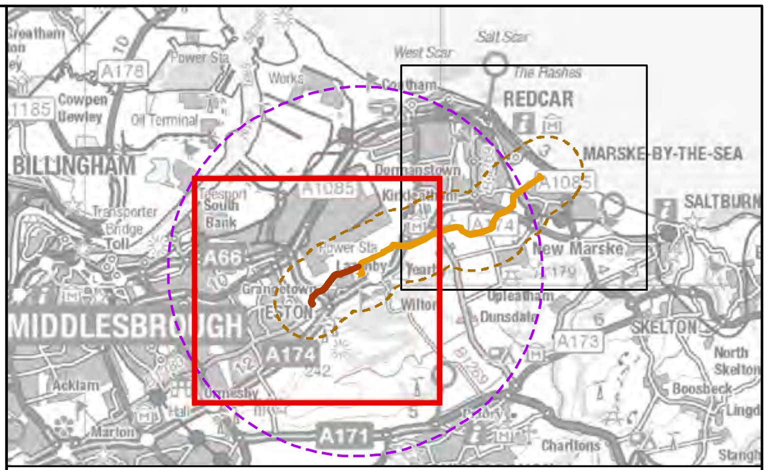
VER	DATE	REMARKS	Drawn	Checked
2	19/03/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER: **5365-4-4a**

SCALE	1:25,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND
LUC





LEGEND

Converter Station LVIA Study Area

Cable Route LVIA Study Area

Cable route

Direct current, open trench

Direct current, HDD

Alternating current, open trench

Alternating current, HDD

HDD or open trench to be confirmed

Major horizontal directional drill entry or exit locations

Minor horizontal directional drill entry or exit locations

Intermediate construction compound

Converter stations

Converter stations site

Converter stations

Converter stations construction compound

Lackenby 400kV substation

Natural designation

Ancient & semi-natural woodland

Ancient replanted woodland

Redcar & Cleveland designations & policies

Sensitive landscape

Green infrastructure green wedge

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

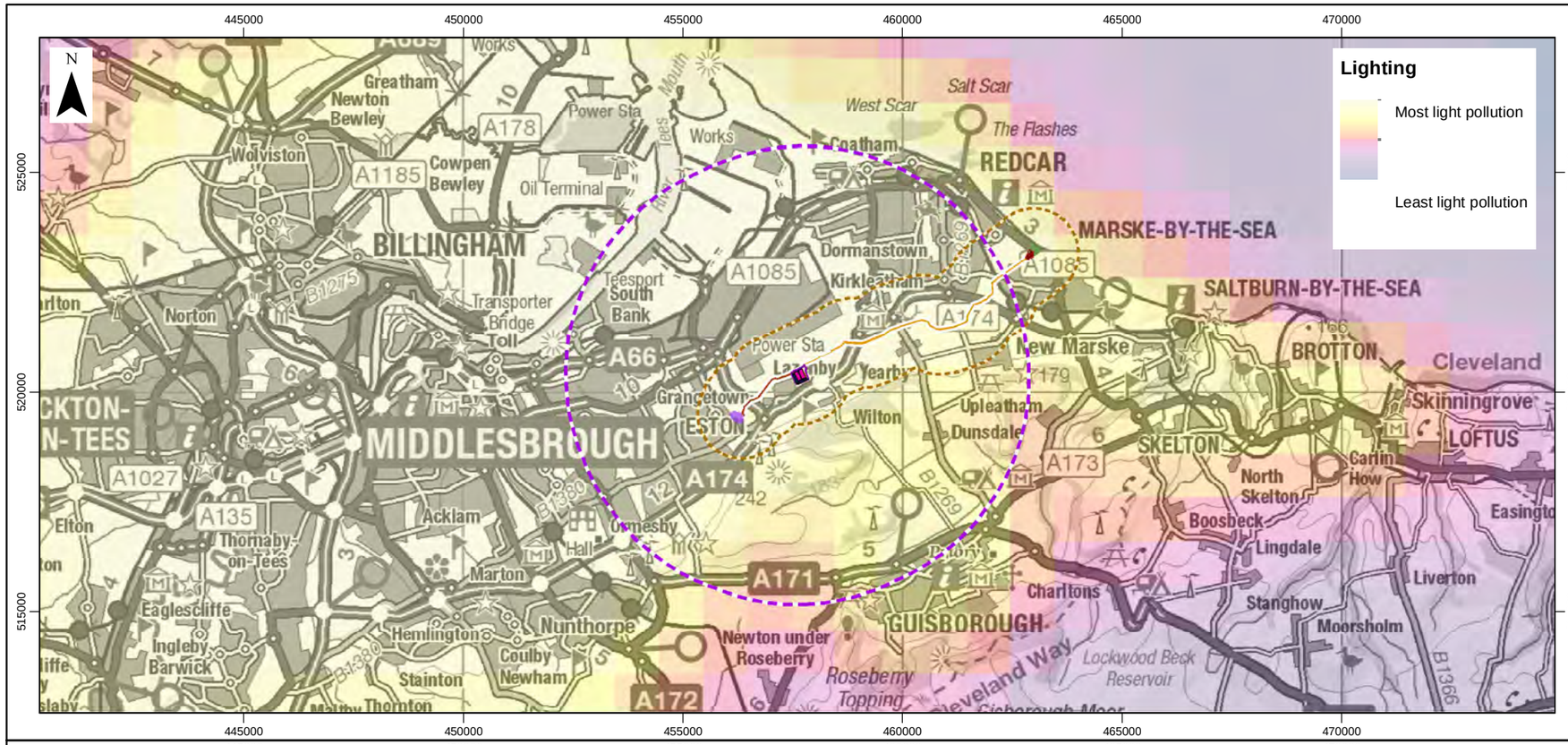
Figure 4.4b: Landscape Resources and Designations (Cable Route and Lackenby Substation)

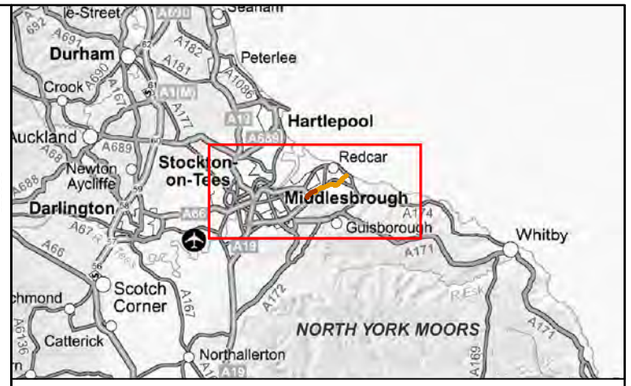
VER	DATE	REMARKS	Drawn	Checked
2	19/03/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER: **5365-4-4b**

SCALE	1:25,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND LUC





LEGEND

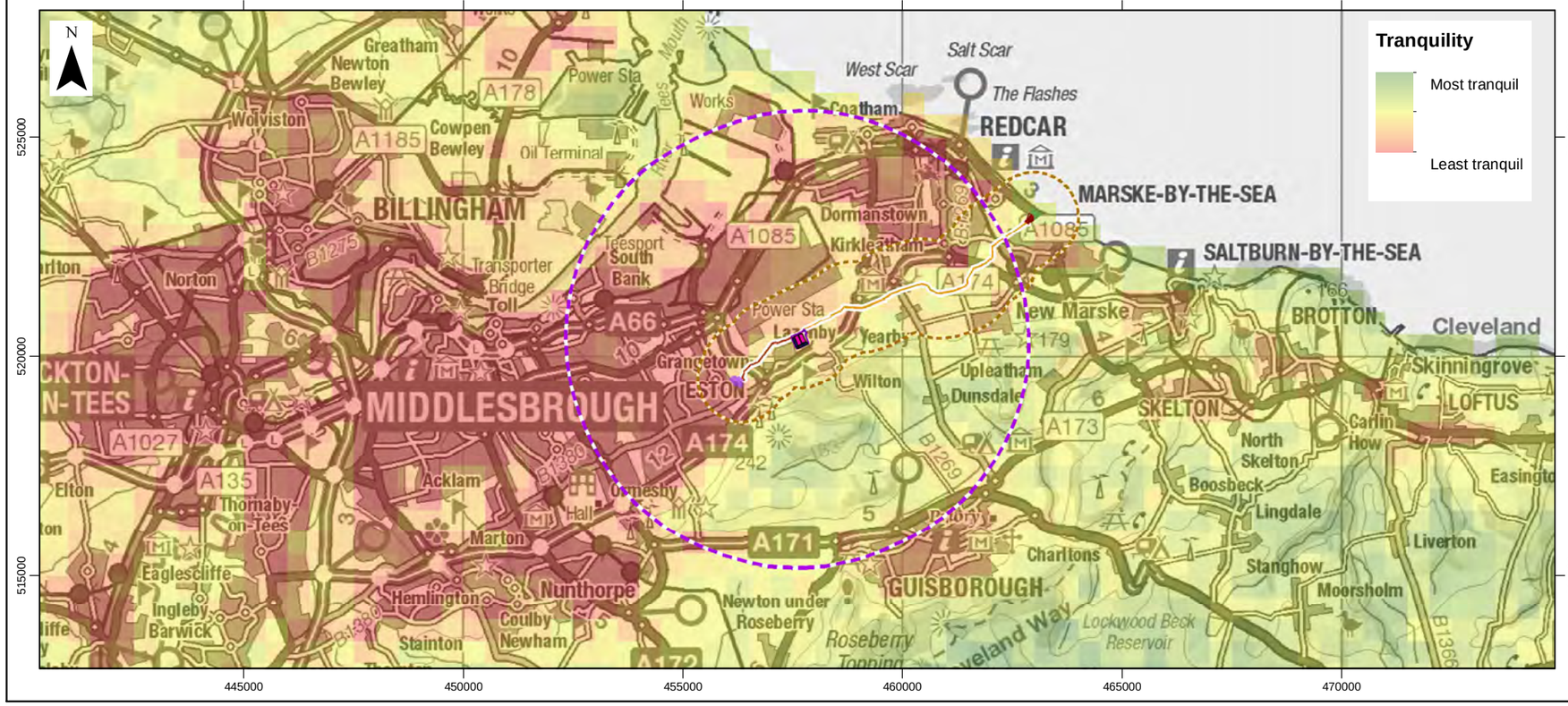
- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current
- Alternating current

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation



0 2.5 5

Kilometres

Source: Forewind, LUC
Tranquility data: Reproduced courtesy of The Campaign to Protect Rural England (CPRE), Natural England and Northumbria University. OS Licence number 100018881
Light pollution data: CPRE/LUC night time satellite imagery. Data obtained and manipulated/analysed by and on behalf of CPRE
Ordnance Survey © Crown Copyright, All rights reserved, 2014. Licence Number 0100031673

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.5: Lighting and Tranquility

VER	DATE	REMARKS	Drawn	Checked
2	04/04/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER:

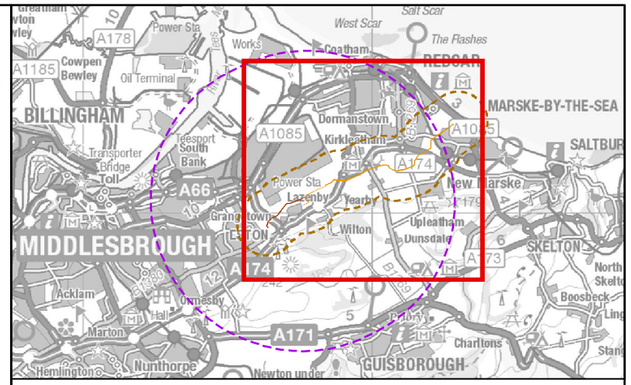
5365-4-5

SCALE	1:125,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND LUC

Visual receptors:

1: Millclose Howle Car Park
2: Bydale Howle Car Park
3: North East Corner of the Marske-by-the-Sea allotments
4: Bydales School
5: Oak Road
6: Mackinlay Park
7: Beardmore Avenue
8: Ryehills Farm
9: Marked path adjacent to the Ings
10: PRoW near Mickle Dales
11: Longbeck Station
12: Junction of A174 & PRoW at Tunstall Gdns.
13: Grewgrass Farm
14: New Marske Methodist Church & St. Thomas' Church
15: Sparrow Park Farm
16: Junction of Lindrick Road, Longbeck Lane and Fell Briggs Farm
17: The Filter House and Thrushwood Farm
18: Errington Wood
19: Junction of Larkswood Road, Plantation Road & A174
20: Turners Arms Farm
21: Conservation Area village of Yearby
22: Kirkleatham Old Hall Museum & Owl Sanctuary
23: PRoW adjacent to Mains Dike
24: Pasture Lane, Lazenby
25: A1053 Greystone Road
26: Lackenby Lane PRoW
27: Crow Lane, Lackenby
28: Wilton Way
29: South Lackenby



LEGEND

- Converter Station LVIA Study Area
- Cable Route LVIA Study Area
- Cable landfall envelope
- Landfall joint transition bay

Cable route

- Direct current, open trench
- Direct current, HDD
- Alternating current, open trench
- Alternating current, HDD
- Major horizontal directional drill entry or exit locations
- Minor horizontal directional drill entry or exit locations
- HDD or open trench to be confirmed
- Primary construction compound
- Intermediate construction compound

Converter stations

- Converter stations site
- Converter stations
- Converter stations construction compound
- Lackenby 400kV substation
- Visual receptor location

0 0.5 1
Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.6: Cable Route Visual Receptors

VER	DATE	REMARKS	Drawn	Checked
2	04/04/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER:

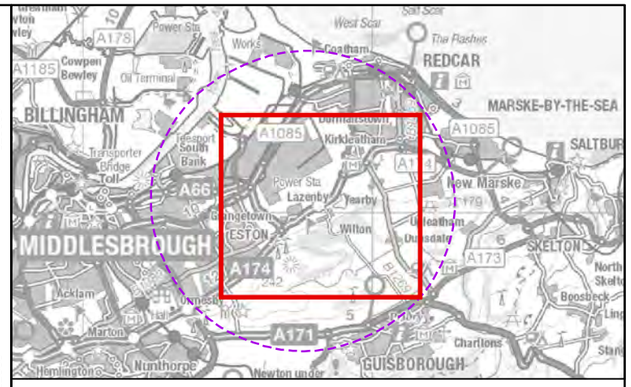
5365-4-6

SCALE	1:30,000	PLOT SIZE	A3	DATUM	OSGB	PROJECTION	BNG

FOREWIND LUC

Viewpoint Location

1: Lazenby, northern edge
2: Pasture Lane, Lazenby
3: Wilton Castle, Wilton
4: Lazenby Bank
5: A1042, southwest of Kirkletham
6: South Lackenby
7: Eston Nab



LEGEND

- Converter Station LVIA Study Area

Converter stations

- Converter stations site
- Converter stations
- Viewpoint location

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 4.7: Converter Station Viewpoints

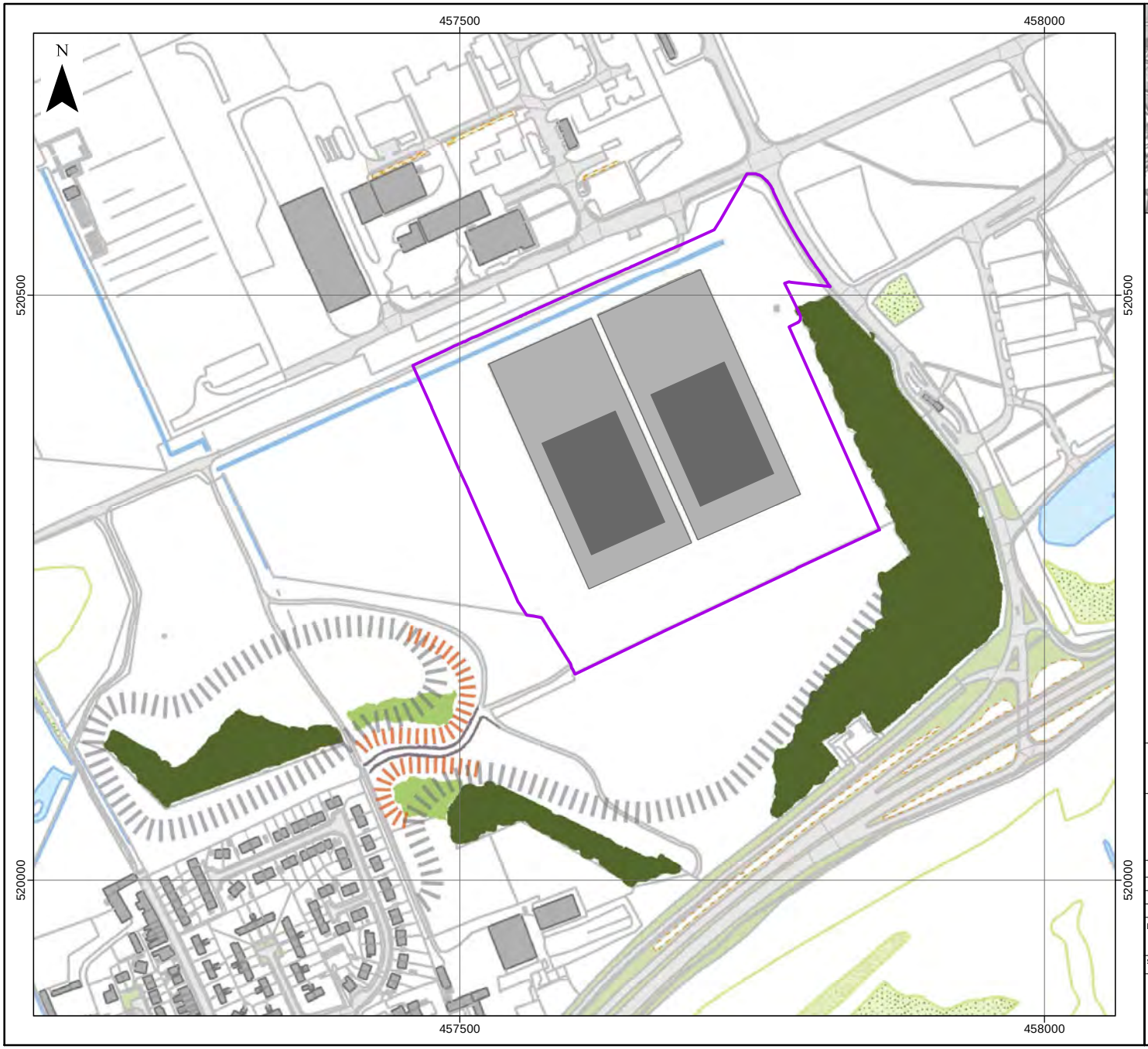
VER	DATE	REMARKS	Drawn	Checked
2	04/04/2013	Draft	RSC	##
4	03/07/2013	Final	EL	MJ
5	23/01/2014	Design change	EL	MJ

DRAWING NUMBER:

5365-4-7

SCALE	PLOT SIZE	DATUM	PROJECTION
1:25,000	A3	OSGB	BNG

FOREWIND LUC



LEGEND

- Converter stations site
- Converter stations
- Converter stations halls
- Existing woodland planting
- Proposed woodland planting
- Existing bunds/landforms
- Proposed extension to existing bunds

0 0.15

Kilometres

PROJECT TITLE

DOGGER BANK TEESSIDE A & B

DRAWING TITLE

Figure 7.1:
Indicative Landscape Mitigation Plan

VER	DATE	REMARKS	Drawn	Checked
1	14/06/2013	Draft	MJ	SO
3	04/02/2014	Final (design change)	EL	MJ
4	19/02/2014	Final (convert to A4)	EL	MJ

DRAWING NUMBER:

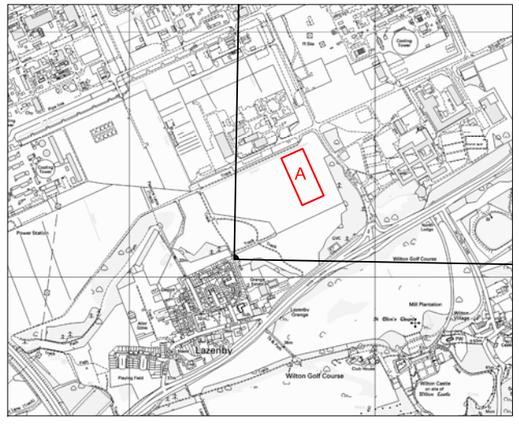
5365-7-1

SCALE	1:5,000	PLOT SIZE	A4	DATUM	OSGB36	PROJECTION	BNG

FOREWIND LUC

Photograph

Photomontage



Viewpoint information

OS Reference:	457427, 520070
Approximate distance to development:	354 m

Photography information

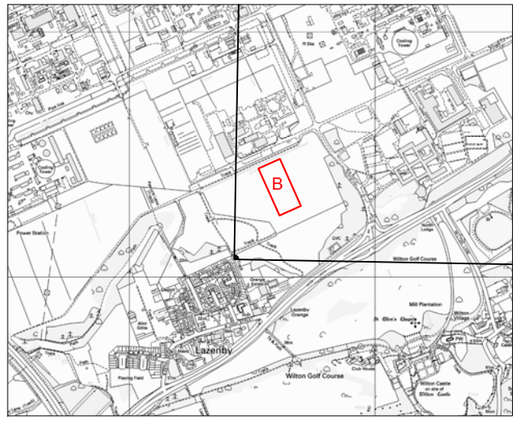
Date:	14th March 2013
Time:	13:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	46°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 1.1: Lazenby northern edge - Dogger Bank Teesside A**

Photograph

Photomontage



Viewpoint information

OS Reference:	457427, 520070
Approximate distance to development:	257 m

Photography information

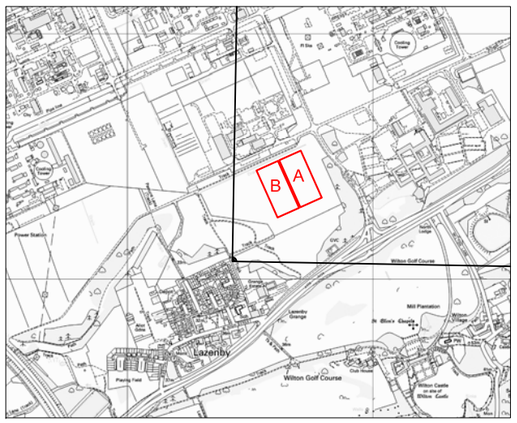
Date:	14th March 2013
Time:	13:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	46°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 1.2: Lazenby northern edge - Dogger Bank Teesside B**

Photograph

Photomontage



Viewpoint information

OS Reference:	457427, 520070
Approximate distance to development:	257 m

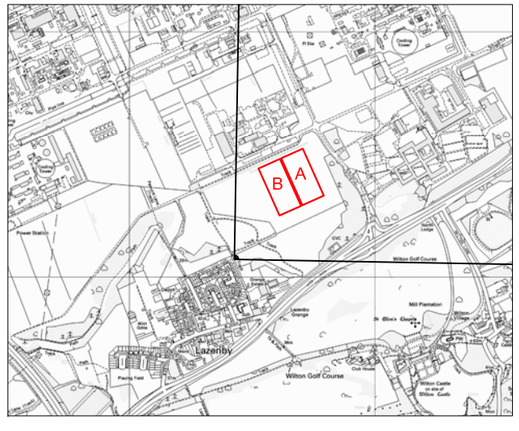
Photography information

Date:	14th March 2013
Time:	13:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	46°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

Viewpoint 1.3: Lazenby northern edge - Dogger Bank Teesside A & B (without mitigation)

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	457427, 520070
Approximate distance to development:	257 m

Photography information

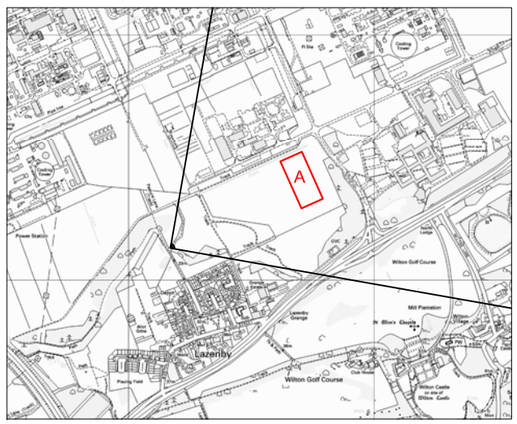
Date:	14th March 2013
Time:	13:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	46°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 1.4: Lazenby northern edge - Dogger Bank Teesside A & B (with mitigation at year 10)**

Photograph

Photomontage



Viewpoint information

OS Reference:	457170, 520129
Approximate distance to development:	555 m

Photography information

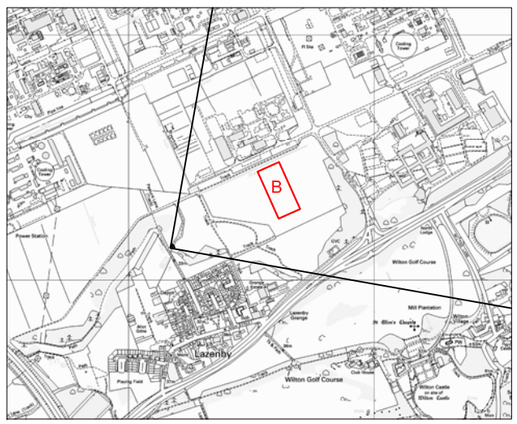
Date:	14th March 2013
Time:	12:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	55°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 2.1: Pasture Lane - Dogger Bank Teesside A**

Photograph

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	457170, 520129
Approximate distance to development:	453 m

Photography information

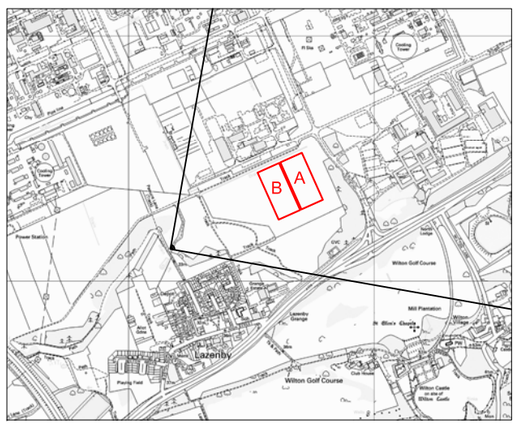
Date:	14th March 2013
Time:	12:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	55°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 2.2: Pasture Lane - Dogger Bank Teesside B**

Photograph

Photomontage



Viewpoint information

OS Reference:	457170, 520129
Approximate distance to development:	453 m

Photography information

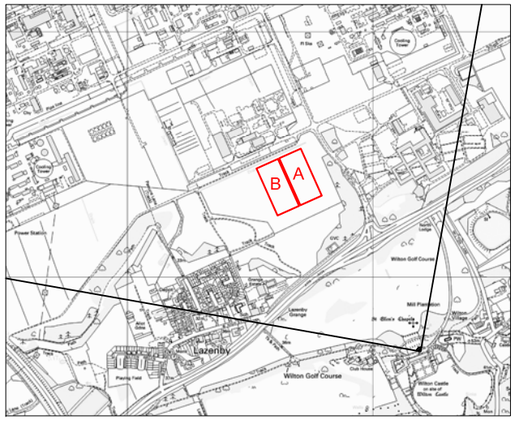
Date:	14th March 2013
Time:	12:30
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	55°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 2.3: Pasture Lane - Dogger Bank Teesside A & B**

Photograph

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

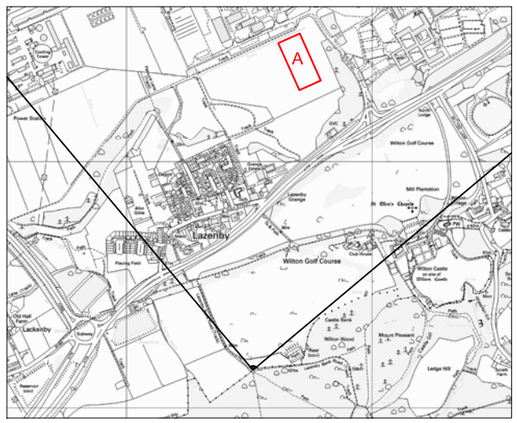
OS Reference:	458190, 519702
Approximate distance to development:	752 m

Photography information

Date:	17th April 2013
Time:	18:15
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	325°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 3.1: Wilton Castle - Dogger Bank Teesside A & B**



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	457515, 519150
Approximate distance to development:	1156 m

Photography information

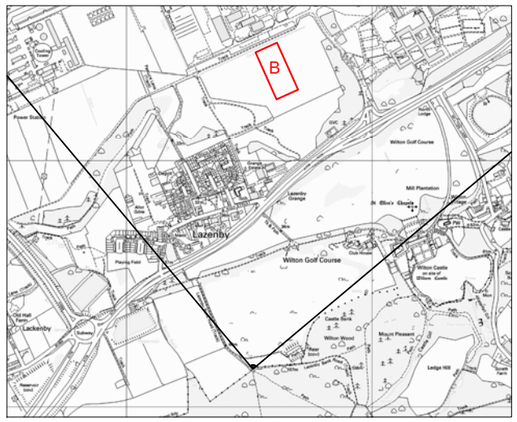
Date:	14th February 2013
Time:	10:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	5°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 4.1: Lazenby Bank - Dogger Bank Teesside A**

Photograph

Photomontage



Viewpoint information

OS Reference:	457515, 519150
Approximate distance to development:	1103 m

Photography information

Date:	14th February 2013
Time:	10:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

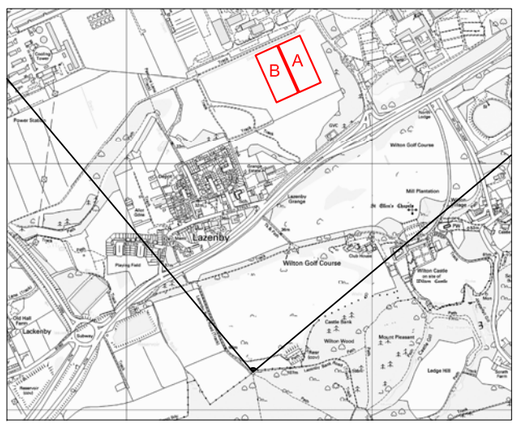
Bearing to centre of view:	5°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

INDICATIVE WORKING PROPOSALS

▸ **Viewpoint 4.2: Lazenby Bank - Dogger Bank Teesside B**

Photograph

Photomontage



Viewpoint information

OS Reference:	457515, 519150
Approximate distance to development:	1103 m

Photography information

Date:	14th February 2013
Time:	10:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	5°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 4.3: Lazenby Bank - Dogger Bank Teesside A & B**

Photograph

Photomontage

INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	459001, 521429
Approximate distance to development:	1582 m

Photography information

Date:	14th March 2013
Time:	09:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	235°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 5.1: A1042 Southwest of Kirkleatham - Dogger Bank Teesside A**

Photograph

Photomontage

INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	459001, 521429
Approximate distance to development:	1682 m

Photography information

Date:	14th March 2013
Time:	09:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	235°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 5.2: A1042 Southwest of Kirkleatham - Dogger Bank Teesside B**

Photograph

Photomontage

INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	459001, 521429
Approximate distance to development:	1582 m

Photography information

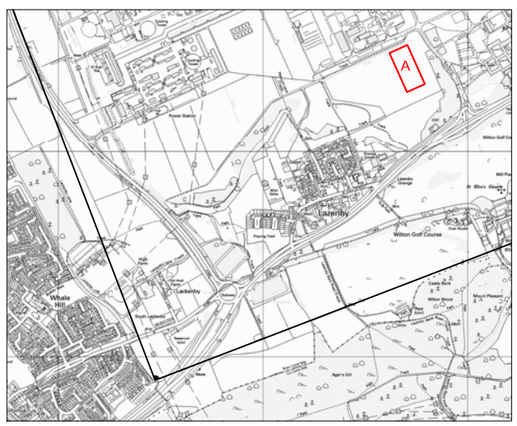
Date:	14th March 2013
Time:	09:50
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	235°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 5.3: A1042 Southwest of Kirkleatham - Dogger Bank Teesside A & B**

Photograph

Photomontage



Viewpoint information

OS Reference:	456472, 518882
Approximate distance to development:	1872 m

Photography information

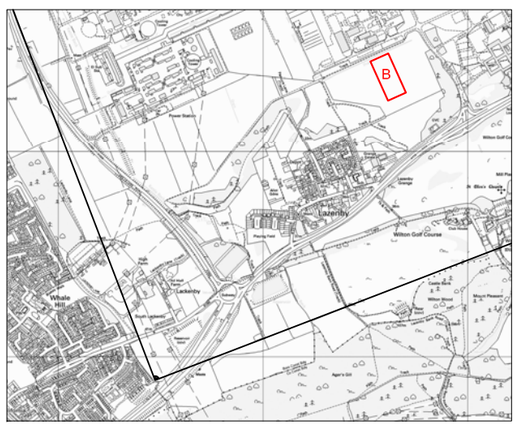
Date:	14th February 2013
Time:	13:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 6.1: South Lackenby - Dogger Bank Teesside A**

Photograph

Photomontage



Viewpoint information

OS Reference:	456472, 518882
Approximate distance to development:	1780 m

Photography information

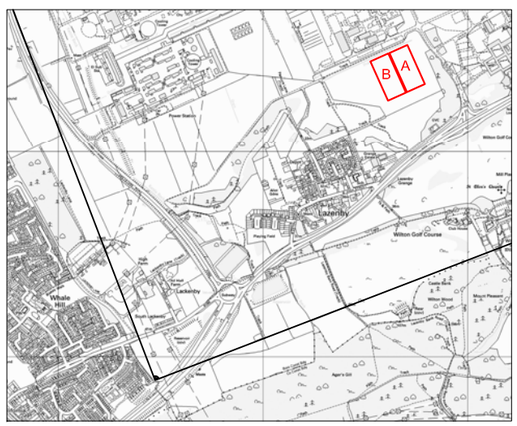
Date:	14th February 2013
Time:	13:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 6.2: South Lackenby - Dogger Bank Teesside B**

Photograph

Photomontage



Viewpoint information

OS Reference:	456472, 518882
Approximate distance to development:	1780 m

Photography information

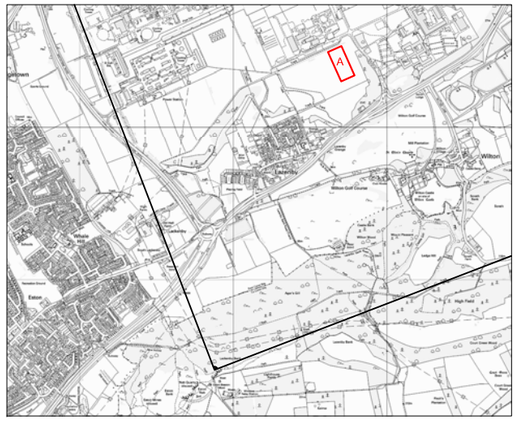
Date:	14th February 2013
Time:	13:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 6.3: South Lackenby - Dogger Bank Teesside A & B**

Photograph

Photomontage



Viewpoint information

OS Reference:	456878, 518410
Approximate distance to development:	2054 m

Photography information

Date:	14th February 2013
Time:	12:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

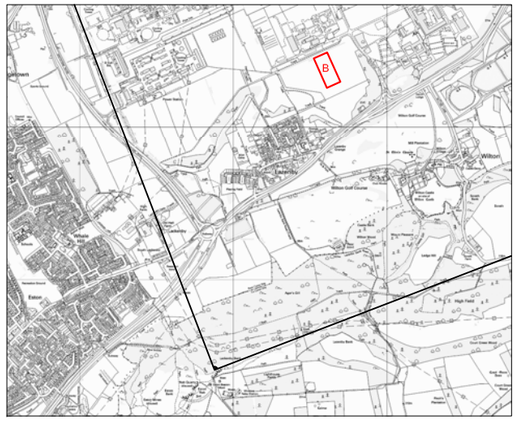
Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

INDICATIVE WORKING PROPOSALS

▸ **Viewpoint 7.1: Eston Nab - Dogger Bank Teesside A**

Photograph

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	456878, 518410
Approximate distance to development:	1980 m

Photography information

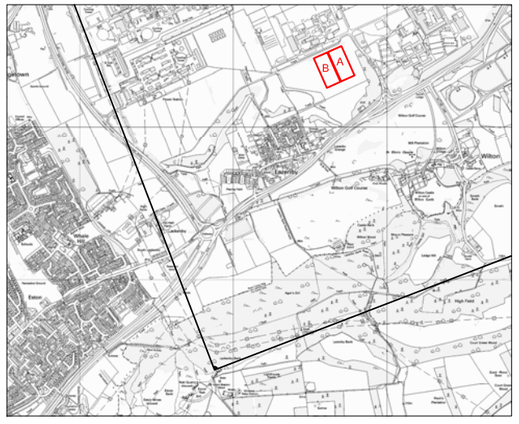
Date:	14th February 2013
Time:	12:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

Viewpoint 7.2: Eston Nab - Dogger Bank Teesside B

Photograph

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	456878, 518410
Approximate distance to development:	1980 m

Photography information

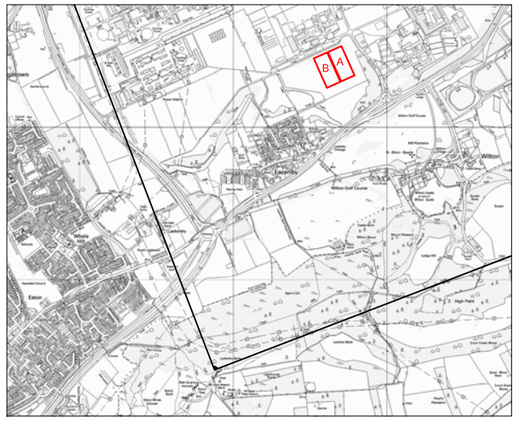
Date:	14th February 2013
Time:	12:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 7.3: Eston Nab - Dogger Bank Teesside A & B**

Photograph

Photomontage



INDICATIVE WORKING PROPOSALS

Viewpoint information

OS Reference:	456878, 518410
Approximate distance to development:	1980 m

Photography information

Date:	14th February 2013
Time:	12:00
Camera type:	Nikon D7000
Focal length:	35 mm
Equivalent Focal length:	52 mm

Bearing to centre of view:	24°
Horizontal field of view:	90°
Recommended viewing distance at A3:	25 cm

▸ **Viewpoint 7.4: Eston Nab - Dogger Bank Teesside A & B (with mitigation at year 10)**