

Triton Knoll Offshore Wind Farm Limited Triton Knoll Electrical System

Mitigation Strategy

April 2015

Document Reference: 8.15

APFP Regulation 5(2)(q)

Triton Knoll Offshore Wind Farm
Limited

Triton Knoll Electrical System

Mitigation Strategy

Document Reference: 8.15

April 2015

Drafted By:	TKOWFL
Approved By:	Kim Gauld-Clark and Paul Carter
Date of Approval	April 2015
Revision	A

Triton Knoll Offshore Wind Farm Ltd
Trigonos
Windmill Hill Business Park
Whitehall Way
Swindon
SN5 6PB

T +44 (0)845 720 090

Email: tritonknoll@rwe.com

I www.rweinnogy.com

www.rweinnogy.com/tritonknoll

LIABILITY

In preparation of this document Triton Knoll Offshore Wind Farm Limited (TKOWFL) and their subconsultants have made reasonable efforts to ensure that the content is accurate, up to date and complete for the purpose for which it was prepared. Neither TKOWFL nor their subcontractors make any warranty as to the accuracy or completeness of material supplied. Other than any liability on TKOWFL or their subcontractors detailed in the contracts between the parties for this work neither TKOWFL or their subcontractors shall have any liability for any loss, damage, injury, claim, expense, cost or other consequence arising as a result of use or reliance upon any information contained in or omitted from this document.

Copyright © 2015 Triton Knoll Offshore
Wind Farm Limited

All pre-existing rights reserved.

Table of Contents

1	INTRODUCTION AND SUMMARY	2
	Overview	2
	The Applicant	2
	Project Overview	2
	Purpose of this Strategy	3
	Scope of this Strategy	3
	Structure of this Strategy	4
	Monitoring	4

Section 2..... Offshore Mitigation

Section 3..... Onshore Mitigation

Section 4..... Offshore Design Mitigation

Section 5..... Onshore Design Mitigation

1 INTRODUCTION AND SUMMARY

Overview

- 1.1 Triton Knoll Offshore Wind Farm Limited (TKOWFL) is submitting an application to the Planning Inspectorate (PINS), on behalf of the Secretary of State for Energy and Climate Change, for a Development Consent Order (DCO) for the Triton Knoll Electrical System (the proposed development) under the Planning Act 2008. The Triton Knoll Electrical System (TKES) would connect the consented Triton Knoll Offshore Wind Farm (TKOWF) to the National Grid substation at Bicker Fen, Boston, and would comprise offshore and onshore export cable circuits, landfall infrastructure, an onshore electrical compound, an onshore substation and works at the Bicker Fen substation.
- 1.2 The TKOWF is located approximately 33km (20.5 miles) east of the Lincolnshire coast. The Secretary of State granted a DCO for the TKOWF on 12th July 2013.
- 1.3 All terms, acronyms and abbreviations used within this Strategy are explained on first use, and / or set out in full within the Glossary appearing in the Environmental Statement – Application Document 6.2.

The Applicant

- 1.4 TKOWFL is a joint venture between two leading international energy companies; RWE Innogy UK Limited and Statkraft UK Limited. RWE Innogy UK is the UK subsidiary of the German renewable energy company RWE Innogy (part of RWE AG), a company with a strong and diversified position in renewable energy development. Statkraft UK Limited is the UK subsidiary of Statkraft Group, Europe's largest generator of renewable energy and the leading power company in Norway.

Project Overview

- 1.5 The components of the TKES, which are needed to connect TKOWF to the National Grid, comprise:
- Up to six offshore export cable circuits – to transmit the high voltage alternating current (HVAC) electricity from the offshore substations to the transition joint bays at the landfall;
 - Landfall infrastructure just north of Anderby Creek, Lincolnshire – including transition joint bays which house the connection between the offshore cables and the onshore cables;

- Up to six onshore export cable circuits (up to 220 kV) – to transmit the HVAC electricity from the transition joint bays at the landfall to the proposed Triton Knoll Substation via the Intermediate Electrical Compound;
 - An Intermediate Electrical Compound near to Orby Marsh – to provide compensation for reactive power to allow more efficient transmission to minimise losses;
 - A substation near the existing Bicker Fen National Grid Substation – to step-up the voltage to the voltage used by the National Grid and provide additional compensation for reactive power built up over the export transmission;
 - Up to four onshore export cable circuits (400 kV) – to transmit the electricity from the proposed Triton Knoll Substation to the existing National Grid substation at Bicker Fen, Boston; and
 - Unlicensed Works within the existing National Grid substation compound comprising up to two bays each accommodating electrical equipment.
- 1.6 The Order Limits for the Triton Knoll Electrical System are shown on the Order Limits Plans (Application Document 2.1).
- 1.7 Any works at the National Grid substation near Bicker Fen required to connect the power produced by TKOWF will be consented, constructed and operated by National Grid (the ‘Enabling Works’). National Grid has not yet completed the engineering studies necessary to define the Enabling Works required at their existing Bicker Fen substation. However, it is anticipated that these works will only involve modifications to the existing infrastructure within the existing site boundary.

Purpose of this Strategy

- 1.8 This Strategy forms part of the application to PINS for a DCO for the TKES. Its purpose is to map the mitigation measures identified within the Environmental Statement (Application Document 6.2).

Scope of this Strategy

- 1.9 This Strategy relates to both the offshore elements of the TKES for the proposed TKOWF, seaward of Mean Low Water (MLW), and the onshore elements of the TKES for the proposed TKOWF, landward of MLW.

Structure of this Strategy

1.10 Within the remainder of this document:

- Section 2 sets out those items of mitigation referred to within the offshore volume (Volume 2) of the Environmental Statement (Application Document 6.2), and identifies where within the draft DCO, Deemed Marine Licence, or other supporting documents those items of mitigation are secured;
- Section 3 sets out those items of mitigation referred to within the onshore volume (Volume 3) of the Environmental Statement (Application Document 6.2), and identifies where within the draft DCO and supporting documents those items of mitigation are secured;
- Section 4 identifies those items of mitigation referred to within the offshore volume (Volume 2) of the Environmental Statement (Application Document 6.2) which relate expressly to the design of the scheme. Where the design of the proposed development offers embedded mitigation (for example through the avoidance of a designated asset) that is secured through the terms of the consent for development within the draft DCO which would be granted. No further reference is therefore made to where this design mitigation would be secured through the draft DCO or its supporting documents; and
- Section 5 identifies those items of mitigation referred to within the onshore volume (Volume 3) of the Environmental Statement (Application Document 6.2) which relate expressly to the design of the scheme. Where the design of the proposed development offers embedded mitigation (for example through the avoidance of a designated asset) that is secured through the terms of the consent for development within the draft DCO which would be granted. No further reference is therefore made to where this design mitigation would be secured through the draft DCO or its supporting documents.

Monitoring

- 1.11 Monitoring will form a central part of certain elements of mitigation which are proposed in respect of the TKES. All relevant monitoring will be conducted in accordance with the monitoring provisions of the various onshore and offshore construction and operational management plans to be approved by the relevant authorities pursuant to the Requirements of the draft DCO, or the Conditions of the Deemed Marine Licence which forms Schedule 9 to the draft DCO.

MITIGATION LOGS

SECTION 2 - OFFSHORE MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference	Where secured	DCO reference
				SECTION 2.1 OFFSHORE PROJECT DESCRIPTION			
1.1				There are no relevant mitigation measures for chapter 1 of this volume			
				SECTION 2.2 MARINE PHYSICAL ENVIRONMENT			
2.2	Marine physical environment	Construction	Embedded mitigation	The cable route has been selected to avoid sandwaves where possible, and the cable route will be optimised further to avoid sandwave features. However where sandwaves are unavoidable installing the cable to a stable burial depth through the sandwaves areas will minimise the potential for exposure and the requirement for external cable protection and disturbance.	Volume 2, Table 2-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
2.3	Marine physical environment	Construction	Embedded mitigation	Within areas characterised by the presence of chalk at the seabed, ploughing rather than jetting techniques will be used to install the cable. This will minimise levels of chalk held in suspension within the water column.	Volume 2, Table 2-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
2.4	Marine physical environment	Construction	Embedded mitigation	Duration of time between trench excavation, cable lay and trench backfill operations at the landfall is to be kept to a minimum (i.e. to be undertaken within one tidal cycle) so as to limit disruption to coastal processes.	Volume 2, Table 2-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
2.5	Marine physical environment	Operation	Embedded mitigation	Where burial depth cannot be achieved, cable armouring will be implemented (e.g. concrete mattresses, rock dump, protective aprons or frond matting). The suitability of installing rock or concrete mattresses for cable protection will be investigated, based on (inter alia) the seabed current data at the location of interest and the assessed risk of impact damage.	Volume 2, Table 2-11	Cable armouring plan	Schedule 9, Part 2, Condition 7(1)(e)
				SECTION 2.3 MARINE ORNITHOLOGY			
3.1				There are no relevant mitigation measures for chapter 3 of this volume			
				SECTION 2.4 INTERTIDAL AND SUBTIDAL ECOLOGY			
4.1	Intertidal and Subtidal Ecology	Operation	Embedded mitigation	Where possible, the export cable will be buried at a depth of at least 1.5 m, in line with EN-3, to limit impacts from EMF.	Volume 2, Table 4-8	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
4.2	Intertidal and Subtidal Ecology	Decommissioning	Embedded mitigation	Decommissioning activities should be preceded by surveys to assess the extent to which benthic species have colonised hard substrate e.g. cable protection. This information can then be used to enable informed decisions to be made regarding the removal/decommissioning of these structures in light of the amount of colonisation of structures and the importance/value of the communities present.	Volume 2, Table 4-9	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.5 FISH AND SHELLFISH			
5.1	Fish and Shellfish	General	Embedded mitigation	An appropriate Project Environmental Management Plan will be produced and followed to cover the operation and maintenance phase of the Triton Knoll Electrical System. The latter will include planning for accidental spills, address all potential contaminant releases and include key emergency contact details (e.g., Environment Agency (EA), Natural England and Maritime and Coastguard Agency (MCA)).	Volume 2, Table 5-9	Project Environmental Management Plan	Schedule 9, Part 2, Condition 7(1)(d)
5.2	Fish and Shellfish	Construction	Embedded mitigation	A Construction Method Statement will be developed and implemented to cover the construction phase.	Volume 2, Table 5-9	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
5.3	Fish and Shellfish	Operation	Embedded mitigation	TKOWFL will commit to using the Cable Burial Index (CBI). Where it is not possible to ensure that cables will remain buried, cable protection will be installed.	Volume 2, Table 5-9	Cable armouring plan	Schedule 9, Part 2, Condition 7(1)(e)
5.4	Fish and Shellfish	Decommissioning	Embedded mitigation	A Decommissioning Plan will be developed to cover the decommissioning phase.	Volume 2, Table 5-9	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.6 MARINE ANIMALS			
6.1	Marine animals	Construction	Embedded mitigation	In the eventuality of vessels with ducted propellers being used TKOWFL would agree appropriate mitigation with regulatory authorities in accordance with relevant guidance and best practice at the time (this commitment has been made for work within the TKOWF and will also be adopted for the export cable route and will follow the JNCC (2012) guidance).	Volume 2, Table 6-8	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)

SECTION 2 - OFFSHORE MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference	Where secured	DCO reference
6.2	Marine animals	Operation	Embedded mitigation	As above	Volume 2, Table 6-8	Offshore operations and maintenance plan	Schedule 9, Part 2, Condition 7(1)(j)
6.3	Marine animals	Decommissioning	Embedded mitigation	As above	Volume 2, Table 6-8	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.7 OFFSHORE CONSERVATION			
7.1	Offshore Conservation	Construction	Embedded mitigation	An Annex I mitigation plan will be developed in consultation with the MMO and relevant SNCBs to minimise interaction with Annex I biogenic reef features.	Volume 2, Table 7-9	Annex I mitigation scheme	Schedule 9, Part 2, Condition 7(1)(h)
7.2	Offshore Conservation	Construction	Embedded mitigation	In the eventuality of vessels with ducted propellers being used (during construction, repair, maintenance or decommissioning), TKOWFL would agree appropriate mitigation with regulatory authorities in accordance with relevant guidance and best practice at the time (this commitment has been made for work within the TKOWF and will also be adopted for the export cable route and will follow the JNCC (2012) guidance).	Volume 2, Table 7-9	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
7.3	Offshore Conservation	Construction	Embedded mitigation	Jetting will not be used areas of chalk to reduce potential SSC and interaction with features such as biogenic reefs.	Volume 2, Table 7-9	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
7.4	Offshore Conservation	Operation	Embedded mitigation	As above with respect to the possible impacts arising from the use of vessels with ducted propellers.	Volume 2, Table 7-9	Offshore operations and maintenance plan	Schedule 9, Part 2, Condition 7(1)(j)
7.5	Offshore Conservation	Decommissioning	Embedded mitigation	As above with respect to the possible impacts arising from the use of vessels with ducted propellers.	Volume 2, Table 7-9	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
				SECTION 2.8 COMMERCIAL FISHERIES			
8.1	Com. Fisheries	General	Embedded mitigation	Promulgation of information including regular notices to mariners, navigational aid and marine charting updates will be utilised in order to ensure sufficient notice for either gear removal and/or avoidance of construction or maintenance areas.	Volume 2, Table 8-10	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
8.2	Com. Fisheries	General	Embedded mitigation	Appointing a Fisheries Liaison Officer (FLO) during all phases to ensure appropriate and proactive communication.	Volume 2, Table 8-10	Condition 7 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 7(1)(d)(iv)
8.3	Com. Fisheries	General	Embedded mitigation	Appointing a Marine Traffic Co-ordinator for all phases to ensure navigational safety.	Volume 2, Table 8-10	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
8.4	Com. Fisheries	Construction	Embedded mitigation	Reporting of sea bed snags and lost equipment, as well as post-construction debris removal in order to minimise the risk of gear snagging.	Volume 2, Table 8-10	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
8.5	Com. Fisheries	Construction	Embedded mitigation	Advance warning and accurate location details of construction operations and associated precautionary areas to ensure sufficient notice for either gear removal and/or avoidance of construction areas.	Volume 2, Table 8-10	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
8.6	Com. Fisheries	Construction	Embedded mitigation	Use of guard vessels, where appropriate to protect construction activities, provide assistance and communicate information to passing vessels.	Volume 2, Table 8-10	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
8.7	Com. Fisheries	Operation	Embedded mitigation	Sufficient marking of fishing gear and co-ordination with wind farm operators to avoid contact and interference between fishing gear and wind farm vessels/equipment within the operational site.	Volume 2, Table 8-10	Condition 4 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 4

SECTION 2 - OFFSHORE MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference	Where secured	DCO reference
8.8	Com. Fisheries	Operation	Embedded mitigation	Advance warning and accurate location details of maintenance operations to ensure sufficient notice for either gear removal and/or avoidance of maintenance area.	Volume 2, Table 8-10	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
8.9	Com. Fisheries	Operation	Embedded mitigation	Notification of all offshore and seabed structure (locations of cables to be disseminated via Kingfisher Information Service – Cable Awareness (KISCA) Charts) to minimise risk of gear snagging.	Volume 2, Table 8-10	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
8.10	Com. Fisheries	Operation	Embedded mitigation	In order to minimise risk of gear snagging and the potential for EMF effects, export cables will be buried to a target depth of 1.5m below stable seabed, determined by a cable burial assessment. Cable protection will be employed where adequate burial cannot be achieved. A maximum extent of 0.29km ² is expected. The locations of cable protection will be provided via Notice to Mariners.	Volume 2, Table 8-10	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
8.11	Com. Fisheries	Decommissioning	Embedded mitigation	Decommissioning plan Prepare a Decommissioning Plan to ensure that any hazards to fishing activities are identified and either removed or marked on charts.	Volume 2, Table 8-10	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.9 SHIPPING AND NAVIGATION			
9.1	Ship. and Nav.	Construction	Embedded mitigation	Vessels used for installation of the proposed development to be manned to ensure safe operation as per International Convention on Standards of Training, Certification and Watch-keeping for Seafarers and in recognition of the tasks for which they are employed. This control is subject to audit.	Volume 2, Table 9-15	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
9.2	Ship. and Nav.	Construction	Embedded mitigation	In addition to full compliance with the applicable rules of their classification society and relevant requirements of SOLAS and MARPOL, vessels used for installation of the proposed development to be maintained in accordance with an approved planned maintenance system, with particular checks of key equipment to ensure appropriate redundancy. This control is subject to audit.	Volume 2, Table 9-15	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
9.3	Ship. and Nav.	Construction	Embedded mitigation	Wide promulgation of information to the marine community of cable laying activities with regular updates of progress.	Volume 2, Table 9-15	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
9.4	Ship. and Nav.	Construction	Embedded mitigation	Procedures for vessels engaged in the installation of the Triton Knoll Electrical System are to include operations in restricted visibility; these procedures being additional to compliance with the Colregs.	Volume 2, Table 9-15	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
9.5	Ship. and Nav.	Construction	Embedded mitigation	Vessels used for installation of the proposed development are to operate in accordance with the agreed Project Environmental Management Plan (PEMMP).	Volume 2, Table 9-15	Project Environmental Management Plan	Schedule 9, Part 2, Condition 7(1)(d)
9.6	Ship. and Nav.	Construction	Embedded mitigation	One or more guard vessels will be present and maintain position close to the cable laying vessel(s). Guard vessels will monitor tracks of passing vessels, compliance with the Colregs and potential interaction with the project's vessels.	Volume 2, Table 9-15	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
9.7	Ship. and Nav.	Construction	Embedded mitigation	Protocols will be developed to identify and react to a potential close quarter situation with a passing vessel.	Volume 2, Table 9-15	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
9.8	Ship. and Nav.	Construction	Embedded mitigation	Information promulgated to mariners would include requests for passing vessels to avoid close quarter situations with and to avoid passing cable installation craft at high speed.	Volume 2, Table 9-15	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
9.9	Ship. and Nav.	Construction	Embedded mitigation	In the event of a navigational mark (such as a buoy) being required to temporarily mark a subsea structure, details of it will be widely promulgated to the marine community.	Volume 2, Table 9-15	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
9.1	Ship. and Nav.	Construction	Embedded mitigation	Details of any locations where newly laid cable that has not yet been buried or protected will be promulgated to the marine community.	Volume 2, Table 9-15	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
9.11	Ship. and Nav.	Operation	Embedded mitigation	It is intended that cables will be buried in accordance with a Cable Burial Assessment (CBA) that reflects the types and sizes of vessels navigating above the cables. Where burial cannot be achieved, alternative protection will be provided.	Volume 2, Table 9-15	Cable armouring plan	Schedule 9, Part 2, Condition 7(1)(e)

SECTION 2 - OFFSHORE MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference	Where secured	DCO reference
9.12	Ship. and Nav.	Decommissioning	Embedded mitigation	As construction	Volume 2, Table 9-15	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.10 OTHER MARINE USERS			
10.1	Other Marine Users - offshore cable	General	Embedded mitigation	Promulgation of information including regular notices to mariners, navigational aids and marine charting updates will be utilised.	Volume 2, Table 10-11	Condition 2 of the Deemed Marine Licence	Schedule 9, Part 2, Condition 2
10.2	Other Marine Users - offshore cable	Construction	Embedded mitigation	The crossing or laying of marine export cables from Triton Knoll Electrical System over or adjacent to existing or future pipelines will be subject to pipeline crossing/proximity agreements between TKOWFL and the pipeline operators, prior to the start of the construction phase.	Volume 2, Table 10-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
10.3	Other Marine Users - offshore cable	Construction	Embedded mitigation	One or more guard vessels will be present and maintain position close to the cable laying vessel(s). Guard vessels will monitor tracks of passing vessels, compliance with the Colregs and potential interaction with the project's vessels. Appropriate safety buffers around construction vessels will be maintained.	Volume 2, Table 10-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
10.4	Other Marine Users - landfall	Construction	Embedded mitigation	In order to avoid damage to sea defences, HDD, drilling or tunnelling under sea defences will be carried out to connect offshore export cables to the onshore portion of the development.	Volume 2, Table 10-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
10.5	Other Marine Users	Operation	Embedded mitigation	One or more guard vessels will be present and maintain position close to maintenance vessel(s). Guard vessels will monitor tracks of passing vessels, compliance with the Colregs and potential interaction with the project's vessels.	Volume 2, Table 10-11	Offshore construction method statement	Schedule 9, Part 2, Condition 7(1)(c)
10.6	Other Marine Users	Decommissioning	Embedded mitigation	Prior to the expiry of any consent granted for Triton Knoll Electrical System, consultation with DECC and any other relevant bodies would be carried out to determine appropriate safety buffers to be maintained around decommissioning vessels.	Volume 2, Table 10-11	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.11 MARINE HISTORIC ENVIRONMENT			
11.1	Marine Historic Environment	Construction	Embedded mitigation	Avoidance of known wrecks through implementation of appropriate buffers	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.2	Marine Historic Environment	Construction	Embedded mitigation	Design of scheme layout to minimise impact to geophysical anomalies of potential anthropogenic origin and archaeological interest	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.3	Marine Historic Environment	Construction	Embedded mitigation	Preservation by record where preservation in situ not possible	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.4	Marine Historic Environment	Construction	Embedded mitigation	Archaeological assessment of further geophysical data and/or geotechnical assessment of cores to identify potential prehistoric sites	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.5	Marine Historic Environment	Construction	Embedded mitigation	Implementation of formal protocol to deal with unknown sites and material encountered during course of development	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.6	Marine Historic Environment	Construction	Embedded mitigation	Watching briefs where seabed material is brought to the surface and if trenching is undertaken in the intertidal zone	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.7	Marine Historic Environment	Construction	Embedded mitigation	Archaeological assessment of additional geophysical data to monitor sites following construction	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)

SECTION 2 - OFFSHORE MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference	Where secured	DCO reference
11.8	Marine Historic Environment	Operation	Embedded mitigation	Avoidance of known sites through implementation of appropriate buffers	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.9	Marine Historic Environment	Operation	Embedded mitigation	Archaeological assessment of additional geophysical data to monitor sites during the working life of the cable.	Volume 2, Table 11-14	Offshore Written Scheme of Investigations	Schedule 9, Part 2, Condition 7(1)(g)
11.10	Marine Historic Environment	Decommissioning	Embedded mitigation	Provision made for methods of removal to minimise further impact Avoidance of known sites through implementation of appropriate buffers	Volume 2, Table 11-14	Decommissioning programme	Schedule 9, Part 1, Paragraph 4
				SECTION 2.12 INTER-RELATIONSHIPS			
12.1				There are no relevant mitigation measures for chapter 12 of this volume			
				SECTION 2.13 CONCLUSIONS AND SUMMARY OF KEY ISSUES			
13.1				There are no relevant mitigation measures for chapter 13 of this volume			

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
				SECTION 3.1 INTRODUCTION			
1.1				There are no relevant mitigation measures for chapter 1 of this volume			
				SECTION 3.2 LANDSCAPE AND VISUAL			
2.1	LVIA	Construction - Intermediate Electrical Compound	Embedded mitigation	The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter in accordance with the CoCP (see Outline Artificial Light Emissions Plan, Application Document 8.7.6).	Volume 3 Table 2-14	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
2.2	LVIA	Construction - Substation	Embedded mitigation	The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter in accordance with the CoCP (see Outline Artificial Light Emissions Plan, Application Document 8.7.6).	Volume 3 Table 2-14	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
2.3	LVIA	Construction - National Grid Substation	Embedded mitigation	The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter in accordance with the CoCP (see Outline Artificial Light Emissions Plan, Application Document 8.7.6).	Volume 3 Table 2-14	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
2.4	LVIA	Construction - onshore cable	Embedded mitigation	A pre-construction walkover survey of the working area will be undertaken by an appropriately experienced arboriculturalist and the guidance set out in BS 5837:2012 Trees in Relation to Construction will be adhered to where applicable. The survey will define specific mitigation measures required for all trees situated in or adjacent to the working width, including measures such as the erection of protective fencing in order to minimise the impacts on trees and their roots.	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 5.13	Requirement 14
2.5	LVIA	Construction - onshore cable	Embedded mitigation	In addition, hedgerow in proximity to the working width will be protected from disruption and if necessary protection fences will be erected to ensure that roots remain undisturbed. Further details of these measures are provided within Document 8.8: Outline Landscape Strategy and Ecological Management Plan	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 5.14	Requirement 14
2.6	LVIA	Construction - onshore cable	Embedded mitigation	Trenchless techniques (Horizontal directional drilling (HDD), microbore or pipejacking) will be adopted at the location of certain sensitive landscape elements, for example: the sand dunes at the landfall point; rivers and drains; and certain lines of trees (i.e. trees which are adjacent to drainage. Drilling under such features avoids the loss or damage to these features. The full list of such features is provided within the Crossing Schedule (Document 8.3).	Volume 3 Table 2-14	Crossing Schedule 8.3	Requirement 5(11)
2.7	LVIA	Construction - onshore cable	Embedded mitigation	The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter in accordance with the CoCP (see Outline Artificial Light Emissions Plan, Application Document 8.7.6).	Volume 3 Table 2-14	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
2.8	LVIA	Construction - onshore cable	Embedded mitigation	Following completion of construction operations all agricultural land will be restored to its previous condition. Topsoil will be prepared and seeded using an appropriate seed mix or returned to arable cultivation. Further details of these measures are provided within Document 8.7.5: Outline Soil Management Plan	Volume 3 Table 2-14	Outline Soil Management Plan (8.7.5) Paragraph 5.12	Requirement 14
2.9	LVIA	Construction - onshore cable	Embedded mitigation	Land drains within agricultural land on the cable route, which may be temporarily affected by construction operations, will also be restored following completion of construction. This is important to ensure that the growth of trees and hedgerows is not affected by changes to the surface water drainage system. Further details of these measures are provided within Document 8.7.1: Construction Method Statement	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 2.52	Requirement 14
2.10	LVIA	Construction - onshore cable	Embedded mitigation	Hedgerows which will have been removed during the construction period will be replanted, including on the cable route. With the exception of the very short section of 400 kV circuits to the south of the existing National Grid Substation at Bicker Fen, trees will not be planted on or within 6 m of the edge of the cable trench to avoid the risk of damage to the cable by tree roots. However, the route has sought to avoid groups of trees where possible with only limited losses likely. Further details of these measures are provided within Document 8.8: Outline Landscape Strategy and Ecological Management Plan	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 2.53	Requirement 14
2.11	LVIA	Construction - onshore cable	Embedded mitigation	Considering the landfall point specifically, the beach area at Anderby Creek will be returned as far as is practicable to its original condition. Further details of these measures are provided within Document 8.7.1: Construction Method Statement	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 4.10	Requirement 14
2.12	LVIA	Construction - onshore cable	Embedded mitigation	Restoration will seek to replace vegetation lost with the same species which are identified within the Phase I habitat survey as far as is practicable. Further details of these measures are provided within Document 8.8: Outline Landscape Strategy and Ecological Management Plan	Volume 3 Table 2-14	Outline Construction Method Statement (8.7.1) Paragraph 2.54	Requirement 14
2.13	LVIA	Decommissioning - all elements	Embedded mitigation	The onshore cable will be removed, for which access will be required to the transition joint bays at the landfall and the cable joint pits only. However, the underground ducting will remain in place, avoiding the requirement for excavation works which will minimise landscape and visual effects.	Volume 3 Table 2-14	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
				SECTION 3.3 SOCIO-ECONOMICS			
3.1	Socio Ec	General	Embedded mitigation	Use of HDD or another appropriate trenchless technique at appropriate locations (see onshore Crossing Schedule Application Document 8.3).	Volume 3 Table 3-8	Crossing Schedule 8.3	Requirement 5(11)

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
3.2	Socio Ec	General	Embedded mitigation	Use of best practice methods	Volume 3 Table 3-8	Outline Construction Method Statement (8.7.1) Paragraph 2.50	Requirement 14
3.3	Socio Ec	General	Embedded mitigation	Ongoing liaison-with statutory and non-statutory consultees, stakeholders and the general public.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.5	Requirement 14
3.4	Socio Ec	Construction - Landfall	Embedded mitigation	Local employers and suppliers will be informed of the proposed construction works and participation of local and regional companies in the tendering process will be encouraged.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.9	Requirement 14
3.5	Socio Ec	Construction - Landfall	Embedded mitigation	The burial of the onshore cable under the sand dunes will be undertaken using trenchless techniques.	Volume 3 Table 3-8	Construction Method Statement (8.7.1) Paragraph 4.2	Requirement 14
3.6	Socio Ec	Construction - Landfall	Embedded mitigation	With the exception of Hutt/10/4, all PRoW will kept open or diverted within the Proposed Development Boundary, to minimise impact for users.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.6 and Outline Construction Method Statement (8.7.1) Paragraph 3.4	Requirement 14
3.7	Socio Ec	Construction - Landfall	Embedded mitigation	PROW closures / diversions will be communicated to Lincolnshire County Council and other relevant organisations, including Parish Councils. Information will include the duration and proposed alternative routes. A PROW Diversion Plan has been prepared as part of the DCO application (Application Document 2.7)	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.7	Requirement 14
3.8	Socio Ec	Construction - Landfall	Embedded mitigation	Nearby caravan parks, chalet sites etc will be informed of construction activities which may affect their usual operations and activities, such as access, opening hours, and planned events.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.8	Requirement 14
3.9	Socio Ec	Construction - Landfall	Embedded mitigation	The use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter in accordance with the CoCP (see Outline Artificial Light Emissions Plan, Application Document 8.7.6)	Volume 3 Table 3-8	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
3.10	Socio Ec	Construction - Onshore cable	Embedded mitigation	Local employers and suppliers will be informed of the proposed construction works and participation of local and regional companies in the tendering process will be encouraged.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.9	Requirement 14
3.11	Socio Ec	Construction - Onshore cable	Embedded mitigation	All PRoW will kept open or diverted within the Proposed Development Boundary, to minimise impact for users.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.6 and Outline Construction Method Statement (8.7.1) Paragraph 3.3	Requirement 14
3.12	Socio Ec	Construction - Onshore cable	Embedded mitigation	PROW closures / diversions will be communicated to Lincolnshire County Council and other relevant organisations, including Parish Councils. Information will include the duration and proposed alternative routes. A PROW Diversion Plan has been prepared as part of the DCO application (Application Document 2.7)	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.7	Requirement 14
3.13	Socio Ec	Construction - Onshore cable	Embedded mitigation	Nearby caravan parks, chalet sites etc will be informed of construction activities which may affect their usual operations and activities, such as access, opening hours, and planned events.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.8	Requirement 14
3.14	Socio Ec	Construction - IEC	Embedded mitigation	Local employers and suppliers will be informed of the proposed construction works and participation of local and regional companies in the tendering process will be encouraged.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.9	Requirement 14
3.15	Socio Ec	Construction - IEC	Embedded mitigation	Nearby caravan parks, chalet sites etc will be informed of construction activities which may affect their usual operations and activities, such as access, opening hours, and planned events.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.8	Requirement 14
3.16	Socio Ec	Construction - Substation	Embedded mitigation	Local employers and suppliers will be informed of the proposed construction works and participation of local and regional companies in the tendering process will be encouraged.	Volume 3 Table 3-8	Outline Communications Plan (8.7.10) Paragraph 2.9	Requirement 14
SECTION 3.4 TERRESTRIAL ECOLOGY							
4.1	Terrestrial ecology	Construction	Embedded mitigation	Areas of habitat disturbed along the cable route will be restored to equivalent habitat condition post-construction. Restoration will seek to replace vegetation with the same species identified in the extended Phase 1 habitat survey as far as is practicable. At construction compounds important neighbouring habitats will be protected from incursion by construction machinery and workforce through the use of signage, fencing and work force briefings.	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraphs 2.54 and 2.10	Requirement 14
4.2	Terrestrial ecology	Construction	Embedded mitigation	The protection, restoration and reinstatement of habitats (including re-seeding if required).	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraphs 2.51 to 2.54	Requirement 14
4.3	Terrestrial ecology	Construction	Embedded mitigation	A reduced working width (maximum 30 m) will be used when crossing ecologically sensitive water courses (e.g. known water vole habitat) and hedgerows.	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 5.15	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
4.4	Terrestrial ecology	Construction	Embedded mitigation	Removal of hedgerows, trees and scrub will be conducted outside of the bird breeding season wherever possible, or the vegetation will be examined for active nests by an ecologist immediately prior to removal.	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 2.37	Requirement 14
4.5	Terrestrial ecology	Construction	Embedded mitigation	Trenchless techniques (HDD/ microbore or pipe jacking) will be employed for the installation of the cable ducts at the location of ecological sensitive receptors including the three locally designated sites that are to be crossed (Huttoft Bank Dunes LWS Old River Lymn LWS and South Forty Foot Drain LWS), rivers and major drains and certain lines of trees (HDD / microbore or pipe jacking) locations provided in Crossing Schedule (Document 8.3)	Volume 3 Table 4-17	Crossing Schedule 8.3	Requirement 5(11)
4.6	Terrestrial ecology	Construction	Embedded mitigation	Where ecologically sensitive drains or ditches are open-cut a narrowed working width of 30m shall be employed (e.g known water vole habitat).	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 5.15	Requirement 14
4.7	Terrestrial ecology	Construction	Embedded mitigation	A draft licence application for the closure of a badger sett will be required prior to submission of the EIA. This will enable a letter of no impediment to be granted by Natural England for works that will affect a badger sett. Natural England have agreed that no other licences will be required, at pre-submission stage, for European or other nationally protected species. The badger licence will include production of a species specific method statement. Further surveys for badgers will be undertaken prior to commencement of ground works to ensure compliance with relevant legislation	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 2.38	Requirement 14
4.8	Terrestrial ecology	Construction	Embedded mitigation	Further surveys for (if required) will be undertaken prior to commencement of ground works to ensure compliance with relevant legislation (e.g. WCA).	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 2.39	Requirement 14
4.9	Terrestrial ecology	Construction	Embedded mitigation	An Ecological Clerk of Works (ECoW) shall be employed for the duration of the project to ensure species specific mitigation method statements and plans are implemented effectively.	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 2.40	Requirement 14
4.10	Terrestrial ecology	Construction	Embedded mitigation	Pollution will be controlled during construction works by following appropriate Environment Agency Guidelines. This will minimise damage to habitats and/or food resources used by fauna and prevent direct toxic effects on individual animals.	Volume 3 Table 4-17	Outline Construction Method Statement (8.7.1) Paragraph 2.41	Requirement 14
4.11	Terrestrial ecology	Construction	Embedded mitigation	Use of artificial light will be minimised to that required for safe working with down lighting to minimise light scatter.	Volume 3 Table 4-17	Outline Artificial Light Emissions Plan (8.7.6) Section 2	Requirement 14
4.12	Terrestrial ecology	Decommissioning	Embedded mitigation	Reinstatement to habitats to former land use following methods outlined above.	Volume 3 Table 4-17	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
SECTION 3.5 LAND USE, AGRICULTURE AND SOILS							
5.1	Land use	Construction	Embedded mitigation	Stabilised cement bound sand will be packed around the ducts in order to aid heat dissipation.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 5.3	Requirement 14
5.2	Land use	Construction	Embedded mitigation	Where required, crossing points will be used in suitable places in order that livestock and vehicles can cross the working width.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.18	Requirement 14
5.3	Land use	Construction	Embedded mitigation	General disruption impacts will be mitigated early in the construction planning process by allowing a sufficient time period between the serving of notice for entry and the commencement of on-site activities; this will allow farmers and landowners time to adapt their working practices in anticipation of the works .	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.26	Requirement 14
5.4	Land use	Construction	Embedded mitigation	In relation to temporary land take requirements TKOWFL will liaise with landowners to agree commercial terms with affected parties including any loss of ongoing payments or fines relating to agri-environmental stewardship schemes.	Volume 3 Table 5-7	These matters will be secured through any land agreement with affected landowners, or the provisions within the draft Order relating to the compulsory acquisition of rights or land	Part 5, where applicable
5.5	Land use	Construction	Embedded mitigation	All soil handling, placing, compaction and management will be undertaken in accordance with best practice (DEFRA, 2009).	Volume 3 Table 5-7	Outline Soil Management Plan (8.7.5) Paragraph 5.1	Requirement 14
5.6	Land use	Construction	Embedded mitigation	A Soil Management Plan (SMP) will be prepared in advance of construction to ensure protection, conservation and reinstatement of soil material, its physical and chemical properties and functional capacity for agricultural use. Mitigation measures to be captured in the SMP comprise the following: <ul style="list-style-type: none"> • Topsoil from areas currently in agricultural use to be stripped before the start of general construction works, with priority focused on those areas of highest grade Best and Most Versatile (BMV) land; • Soils shall be categorised on the basis of their condition and origin, and stockpiled/stored in line with best practice (i.e. under the driest conditions possible and gathered by tracked/wide-tyre vehicles to reduce compaction); • Transportation of soils to be kept to the absolute minimum to reduce the risk of contamination between fields; • Soils suitable for reuse as part of wider mitigation (e.g. planting areas) to be reused in a broadly similar location to their origin, and stored for the shortest amount of time permissible; and • Any surplus soils should be disposed of in an appropriate manner off-site. 	Volume 3 Table 5-7	Outline Soil Management Plan (8.7.5) Paragraph 5.1	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
5.7	Land use	Construction	Embedded mitigation	Plant and traffic movements will be confined to designated routes (e.g. haul routes and vehicle access routes) to minimise the potential for soil disturbance, compaction and indirect contamination..	Volume 3 Table 5-7	Outline Traffic Management Plan (8.9)	Requirement 18
5.8	Land use	Construction	Embedded mitigation	Measures contained in relevant DEFRA and Environment Agency best practice guidance on the control and removal of invasive weed species will be implemented.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.45	Requirement 14
5.9	Land use	Construction	Embedded mitigation	The mains work contractor will cease work and advise the Animal Health Regional Office should animal bones be discovered which indicate a potential burial site.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.44	Requirement 14
5.10	Land use	Construction	Embedded mitigation	Agricultural Liaison Officer (ALO) will record existing crop regimes, position and condition of field boundaries, existing drainage and access arrangements and private water supplies (as far as reasonable investigations allow) and liaise with affected landowners to record potential constraints and mitigations to be entered into a pre-entry record of condition for the affected landowner.	Volume 3 Table 5-7	Outline Soil Management Plan (8.7.5) Paragraphs 3.1 to 3.4	Requirement 14
5.11	Land use	Construction	Embedded mitigation	The ALO will also help with the agreement of re-instatement measures after completion of works.	Volume 3 Table 5-7	Outline Soil Management Plan (8.7.5) Paragraphs 3.1 to 3.4	Requirement 14
5.12	Land use	Construction	Embedded mitigation	Following the completion of all cable construction works, the land within the working width will be fully reinstated as near as practically possible to its former condition.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.51	Requirement 14
5.13	Land use	Construction	Embedded mitigation	Any hedgerow sections removed during the works will be replanted, with all field boundary and stock fences reinstated.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.53	Requirement 14
5.14	Land use	Construction	Embedded mitigation	All potentially affected utility providers will be contacted and the location of existing services will be accurately identified on the ground prior to construction.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.32	Requirement 14
5.15	Land use	Construction	Embedded mitigation	TKOWFL will undertake all utility crossings in accordance with the standards defined by the utility owner/operator.	Volume 3 Table 5-7	Outline Construction Method Statement (8.7.1) Paragraph 2.35	Requirement 14
5.16	Land use	Operation	Embedded mitigation	In relation to permanent land take requirements TKOWFL will discuss with affected parties and secure commercial terms with them.	Volume 3 Table 5-7	These matters will be secured through any land agreement with affected landowners, or the provisions within the draft Order relating to the compulsory acquisition of rights or land	Part 5, where applicable
5.17	Land use	Operation	Embedded mitigation	Any permanent restriction of certain activities above the cable will be discussed with affected landowners and secured in the commercial terms with them.	Volume 3 Table 5-7	These matters will be secured through any land agreement with affected landowners, or the provisions within the draft Order relating to the compulsory acquisition of rights or land	Part 5, where applicable
5.18	Land use	Operation	Embedded mitigation	TKOWFL will discuss with affected parties and secure commercial terms with them including the loss of any ongoing payments or fines relating to agri-environmental stewardship schemes that may be affected by the permanent land restrictions or any cable maintenance or repair work.	Volume 3 Table 5-7	These matters will be secured through any land agreement with affected landowners, or the provisions within the draft Order relating to the compulsory acquisition of rights or land	Part 5, where applicable
5.19	Land use	Decommissioning	Embedded mitigation	Any new legislation or guidelines published prior to decommissioning will be adhered to and incorporated into mitigation design prior to any decommissioning taking place.	Volume 3 Table 5-7	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
5.20	Land use	Construction	Additional mitigation	Additional specific mitigation options proposed to minimise the impact on LCGM in certain areas.	Volume 3 Paragraphs 5.74, 5.90 and 5.118	Outline Construction Method Statement (8.7.1) Paragraph 2.42	Requirement 14
SECTION 3.6 GEOLOGY, HYDROGEOLOGY AND GROUND CONDITIONS							
6.1	Geology	General	Embedded mitigation	Use of HDD/ microbore /pipe jacking at appropriate locations (Crossing Schedule (Document 8.3)	Volume 3 Table 6-7	Crossing Schedule 8.3	Requirement 5(11)
6.2	Geology	General	Embedded mitigation	Relevant legislation will be adhered to on site to reduce the risk of contamination. Further details are provided within the Outline Construction Environmental Management Plan (Application Document 8.7.9).	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.19	Requirement 14
6.3	Geology	General	Embedded mitigation	The following EA Pollution Prevention Guidance (PPGs) will be followed on site to prevent pollution. Further details of these measures are provided within the Outline Construction Environmental Management Plan (Application Document 8.7.9).	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.20	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
6.4	Geology	Construction	Embedded mitigation	The cable and HDD/microbore/pipe-jacking sections when located above Chalk strata will be positioned so as not to intersect with that strata and the principal aquifer and provide preferential migration pathways for contaminants. The detailed methodology of the construction techniques to be addressed and agreed with the EA and Local Planning Authority (LPA) and the necessary consents obtained, if required.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 5.4	Requirement 14
6.5	Geology	Construction	Embedded mitigation	Clay stanks or other vertical barriers constructed within trench excavations, where deemed necessary, to prevent the creation of preferential migration pathways for contaminants (where suspected).	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 5.5	Requirement 14
6.6	Geology	Construction	Embedded mitigation	Subsoils will be placed and 'naturally' consolidated (to the same as the surroundings) within the trench excavations and in reverse order to its removal. Where there is excess subsoil within an area, soils will be spread over the working width and in agreement with the landowner.	Volume 3 Table 6-7	Outline Soil Management Plan (8.7.5) Paragraph 5.12	Requirement 14
6.7	Geology	Construction	Embedded mitigation	Ground investigation for geotechnical and or environmental purposes would be undertaken pre-construction at key points including the Intermediate Electrical Compound, Substation and where surface water, road and rail crossings occur. Investigations may also be required if the proposed development passes in close proximity to a landfill or other as yet un-identified contaminant source.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 2.43	Requirement 14
6.6	Geology	Construction	Embedded mitigation	EA guidance on the assessment of risks from potentially contaminated land will be followed on a site-specific basis in line with Contaminated Land Report 11 (CLR11). Further details of these measures are provided within the Outline Construction Environmental Management Plan (Application Document 8.7.9).	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.22	Requirement 14
6.7	Geology	Construction	Embedded mitigation	Work would stop if any previously unidentified contamination is encountered until the nature and concentration of the contaminant(s) are determined and appropriate risk control measures implemented in accordance with the Outline Construction Environmental Management Plan (Application Document 8.7.9).	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.25	Requirement 14
6.8	Geology	Construction	Embedded mitigation	Prior to intrusive investigations commencing appropriate service clearance surveys and utility searches would be undertaken to identify below ground services and utilities to avoid damage to third party property. This would include liaison with the relevant owner/ operator to accurately identify the precise location of services/utilities.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 2.32	Requirement 14
6.9	Geology	Construction	Embedded mitigation	A Pollution Prevention and Emergency Response Plan (PPERP) will be prepared and will be held on all construction sites to follow in the event of an environmental emergency. Refer to the Outline Pollution Prevention and Emergency Incident Response Plan (Application Document 8.7.8).	Volume 3 Table 6-7	Outline Pollution Prevention and Emergency Incident Response Plan (8.7.8)	Requirement 14
6.10	Geology	Construction	Embedded mitigation	Recycled alternative materials would be encouraged to be used on site. The source of the materials would be from a sustainable source. A 'just-in-time' strategy would be adopted to keep stocks of materials on site to a minimum. Further details of these measures are provided within the Outline Site Waste Management Plan (Application Document 8.7.7).	Volume 3 Table 6-7	Outline Site Waste Management Plan (8.7.7) Paragraphs 5.3 to 5.5	Requirement 14
6.11	Geology	Construction	Embedded mitigation	Control measures relating to the storage of waste on site will be detailed within a Site Waste Management Plan. Refer to Outline Site Waste Management Plan (Application Document 8.7.7).	Volume 3 Table 6-7	Outline Site Waste Management Plan (8.7.7)	Requirement 14
6.12	Geology	Construction	Embedded mitigation	All fuel and chemical storage will comply with relevant storage regulations. Further details of these measures are provided within the Outline Pollution Prevention and Emergency Incident Response Plan (PPEIRP) (Application Document 8.7.8).	Volume 3 Table 6-7	Outline Pollution Prevention and Emergency Incident Response Plan (8.7.8) Paragraph 3.8	Requirement 14
6.13	Geology	Construction	Embedded mitigation	Vehicle checks will be conducted to ensure fuel storage and engine condition is satisfactory and that no fuel or chemical release will occur during site operations. Further detail is provided within the Outline Pollution Prevention and Emergency Incident Response Plan (PPEIRP) (Application Document 8.7.8).	Volume 3 Table 6-7	Outline Pollution Prevention and Emergency Incident Response Plan (8.7.8) Paragraph 3.17	Requirement 14
6.14	Geology	Construction	Embedded mitigation	Deep excavations may require de-watering. Water pumped or removed from excavations would be passed through a silt-separator tank or equivalent, and discharge to ground or surface water. An environmental permit would be sought from the EA prior to undertaking such operations.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 5.5	Requirement 14
6.15	Geology	Construction	Embedded mitigation	Extended excavations would be arranged so as not to create preferential drainage pathways with the potential to cause flooding of lower land.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 5.5	Requirement 14
6.16	Geology	Construction	Embedded mitigation	Consideration to the inclusion of clay stanks/plugs along trenches should be designed into the cable trench sections to mitigate against the creation of preferential pathways for contaminant migration.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraph 5.5	Requirement 14
6.17	Geology	Construction	Embedded mitigation	Potential risks to construction and maintenance workers arising from contamination within soil and groundwater during the construction phase(s) of the proposed development would be controlled under the Construction Design and Management (CDM) Regulation 2015, the requirement to work in accordance with best practice and statutory guidance and the requirement for PPE as standard working practice.	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.27	Requirement 14
6.18	Geology	Construction	Embedded mitigation	Foundation design for the Intermediate Electrical Compound and Substation components will consider artesian groundwater conditions should a piled foundation option be considered.	Volume 3 Table 6-7	Outline Construction Method Statement (8.7.1) Paragraphs 6.2 and 7.2	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
6.19	Geology	Construction	Embedded mitigation	Monitoring would be undertaken of: <ul style="list-style-type: none"> • Ground and surface water conditions to check for spills or uncontrolled tipped surface spoil; • Oil tanks and associated bunds for leaks; and • Plant containing oils and fuel would be inspected daily and maintained to both prevent and identify leaks. Further details are provided within the Outline Construction Environmental Management Plan (Application Document 8.7.9).	Volume 3 Table 6-7	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.28	Requirement 14
SECTION 3.7 HYDROLOGY AND FLOOD RISK							
7.1	Hydrology	Construction - Onshore cable	Embedded mitigation	Obtain appropriate consent for any specified works, being so much of any work or operation authorised by the Order as is in, on under over or within 16m of a drainage work or is otherwise likely to (a) Affect any drainage work or the volumetric rate of flow of water in or flowing to or from any drainage work; (b) Affect the flow, purity or quality of water in any watercourse; or (c) Affect the conservation, distribution or use of water resources. In relation to any consent:- <ul style="list-style-type: none"> • Ensure that runoff from the construction compounds, haul road and any other areas of reduced permeability is kept to IDB specified rate or less (less than 1.4 l.s-1.ha-1 or a de minimis rate of 5 l.s-1) • Any discharge (e.g. from de-watering or vehicle washing) to watercourses will require the consent and appropriate licensing from the Environment Agency and relevant management authority (e.g. IDB); treatment prior to discharge to maintain water quality; and, will likely need to be discharged at the IDB specified rate or less (less than 1.4 l.s-1.ha-1 or a de minimis rate of 5 l.s-1). 	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraphs 2.46 and 2.47	Requirement 14
7.2	Hydrology	Construction - IEC and Substation	Embedded mitigation	Piling for foundations must be less than the depth to the underlying chalk aquifer.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 6.2	Requirement 14
7.3	Hydrology	Construction - IEC and Substation	Embedded mitigation	As per the drainage strategy referenced in Annex 7-3 (which will inform the surface water drainage scheme), ensure that runoff from the final development, associated construction compounds, temporary and permanent roads and any other areas of reduced permeability is kept to the IDB specified rate or less (less than 1.4 l.s-1.ha-1 or a de minimis rate of 5 l.s-1). Any outfall to local watercourses will be undertaken according to the relevant Byelaws.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraphs 2.46 and 2.47	Requirement 14
7.4	Hydrology	Construction - NGET Substation	Embedded mitigation	Piling for foundations must be less than the depth to the underlying chalk aquifer.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 7.2	Requirement 14
7.5	Hydrology	Construction - NGET Substation	Embedded mitigation	As per the drainage strategy referenced in Volume 5, Annex 7-3, ensure that runoff from the final development is managed in line with the existing drainage arrangements for the site.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraphs 2.46 and 2.47	Requirement 14
7.6	Hydrology	Construction - onshore cable	Embedded mitigation	Trenchless techniques (HDD, pipejacking or microbore) will be used to construct cable beneath sensitive assets such as major watercourses and flood defences. (Crossing Schedule (Document 8.3)	Volume 3 Table 7-10	Crossing Schedule 8.3	Requirement 5(11)
7.7	Hydrology	Construction - onshore cable	Embedded mitigation	Trenchless techniques will be undertaken using experienced contractors adhering to industry best practice.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 2.50	Requirement 14
7.8	Hydrology	Construction - onshore cable	Embedded mitigation	Cable will be buried at a minimum of 2 metres underneath the bottom of flood defences to reduce potential construction effects	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 5.9	Requirement 14
7.9	Hydrology	Construction - onshore cable	Embedded mitigation	Where practically possible, HDD, pipejacking or microbore techniques will not be undertaken on sections of defence where other assets such as culvert intersect i.e. not where the defence is inherently weaker.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 5.10	Requirement 14
7.10	Hydrology	Construction - onshore cable	Embedded mitigation	Clay bungs will be used along the cable ducting where necessary to prevent the creation of preferential drainage pathways.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 5.11	Requirement 14
7.11	Hydrology	Construction - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Appropriate industry best practice and published guidelines will be followed to reduce pollutant and sediment movement during all aspects of construction through a construction environmental management plan or similar document. Guidelines include, but are not limited to: <ul style="list-style-type: none"> • Environment Agency, Pollution Prevention Guidance Note 6 (PPG6): Pollution Prevention Guidelines – Working at Construction and Demolition Sites • Environment Agency, Pollution Prevention Guidance Note 5 (PPG5): Working in, near or liable to affect watercourses; • Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C650); • CIRIA – SuDS Manual 	Volume 3 Table 7-10	Outline Construction Environmental Management Plan (8.7.9) Paragraph 2.35	Requirement 14
7.12	Hydrology	Construction - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Construction materials and spoil materials will be positioned in a manner that does not constrain potential flood waters unduly or direct flood waters towards population or industrial centres of high sensitivity.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 2.48	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
7.13	Hydrology	Construction - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Construction will not be undertaken during very extreme wet weather where erosion of sediments and risk from flooding may increase.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 2.49	Requirement 14
7.14	Hydrology	Construction - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Existing land drainage will be re-instated to ensure land drainage is unaffected.	Volume 3 Table 7-10	Outline Construction Method Statement (8.7.1) Paragraph 2.52	Requirement 14
7.15	Hydrology	Construction - IEC, Substation and NGET substation	Embedded mitigation	Installed oil filled equipment will be banded to ensure that leaks of pollutants does not occur.	Volume 3 Table 7-10	Outline Pollution Prevention and Emergency Incident Response Plan (8.7.8) Paragraph 3.9	Requirement 14
7.16	Hydrology	Operation - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Maintenance and repairs will follow the same rules, regulations and best practice (or updated recommendations as exist) as were followed during construction including obtaining consent from the relevant consenting bodies where repairs are required adjacent to a watercourse (i.e. within 9 metres).	Volume 3 Table 7-10	Where consent is necessary, that will be governed by the protective provisions within the draft Order	Schedule 8, where applicable
7.17	Hydrology	Decommissioning - Onshore cable, IEC, Substation and NGET substation	Embedded mitigation	Maintenance and repairs will follow the same rules, regulations and best practice (or updated recommendations as exist) as were followed during construction complying with the provisions of the bylaws of relevant authorities where repairs are required adjacent to a watercourse (i.e. within 9 metres).	Volume 3 Table 7-10	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
SECTION 3.8 HISTORIC ENVIRONMENT							
8.1	Historic Environment	Construction	Embedded mitigation	A Written Scheme of Investigation (WSI) will be implemented. An Outline WSI is provided as Application Document 8.11.	Volume 3 Table 8-7	Outline Onshore Written Scheme of Investigation (8.11)	Requirement 12
8.2	Historic Environment	Construction	Embedded mitigation	Mitigation measures for implementation during construction phase are guided by initial geophysical survey and targeted trial trenching within the Proposed Development Boundary in order to specify and programme either: -Preservation <i>in situ</i> -Preservation by record These measures will be implemented through the Onshore Written Scheme of Investigation for archaeological assets. An Outline WSI accompanies this application (Application Document 8.11)	Volume 3 Table 8-7	Outline Onshore Written Scheme of Investigation (8.11)	Requirement 12
8.3	Historic Environment	Construction	Embedded mitigation	Positive effects of mitigation occurring as part of/immediately following construction phase include the reinstatement of hedgerows and other field boundaries, and the topographical reinstatement of areas of significant historical 'ridge and furrow' earthworks, which would offset any readily visible impacts to historic landscape character. These measures will be implemented through the Onshore Written Scheme of Investigation for archaeological assets. An Outline WSI accompanies this application (Application Document 8.11)	Volume 3 Table 8-7	Outline Onshore Written Scheme of Investigation (8.11)	Requirement 12
SECTION 3.9 TRAFFIC AND ACCESS							
9.1	Traffic	Construction	Embedded mitigation	Proposed implementation of a travel plan to encourage use of sustainable travel, in particular car-sharing, to minimise the impact on the road network for all elements of construction.	Volume 3 Table 9-16	Outline Traffic Management Plan (8.9)	Requirement 18
9.2	Traffic	Construction	Embedded mitigation	Proposed implementation of an Access Management Plan to secure acceptable design and location of access to temporary working areas, permanent access for the Substation and Intermediate Electrical Compound, and off-site infrastructure improvements to cater for movement of HGV construction traffic, where necessary.	Volume 3 Table 9-16	Outline Access Management Plan (8.13)	Requirement 8
9.3	Traffic	Construction	Embedded mitigation	Proposed use of the temporary haul road from the A158 to serve the Intermediate Electrical Compound to avoid routing HGVs along Marsh Lane through the village of Orby.	Volume 3 Table 9-16	Outline Traffic Management Plan (8.9)	Requirement 18
9.4	Traffic	Construction	Embedded mitigation	Proposed implementation of a Traffic Management Plan to secure appropriate routing of HGV construction for all elements, including details of monitoring and enforcement, management of road crossings, communication with local residents and businesses, and PROW for the cable route.	Volume 3 Table 9-16	Outline Traffic Management Plan (8.9)	Requirement 18
9.5	Traffic	Decommissioning	Embedded mitigation	Proposed implementation of a Traffic Management Plan to secure appropriate routing of HGV movements for the IEC and Substation	Volume 3 Table 9-16	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
SECTION 3.10 AIR QUALITY							
10.1	AQ	General	Embedded mitigation	Mitigation measures aimed at reducing impacts on air quality, and as referred to within this chapter, will be secured through an Air Quality Management Plan. An Outline Air Quality Management Plan has been provided as Application Document 8.7.4.	Volume 3 Table 10-5	Outline Air Quality Management Plan (8.7.4)	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
10.2	AQ	Construction	Embedded mitigation	Develop and implement a stakeholder Communications Plan that includes community engagement before work commences on site. An Outline Communications Plan has been included with the application (Document 8.7.10). Display the name and contact details of people accountable/responsible for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. Display the head or regional office contact information.	Volume 3 Table 10-5	Outline Communications Plan (8.7.10) and Outline Air Quality Management Plan (8.7.4) Paragraph 2.3	Requirement 14
10.3	AQ	Construction	Embedded mitigation	Implementation of a Construction Traffic Management Plan to secure appropriate routing of HGV construction for the construction of all elements, management of road crossings and public rights of way for the cable route. An Outline Traffic Management Plan has been included with the application (Document 8.9).	Volume 3 Table 10-5	Outline Traffic Management Plan (8.9)	Requirement 18
10.4	AQ	Construction	Embedded mitigation	Implementation of a Construction Travel Plan to encourage use of sustainable travel, in particular car-sharing, to minimise the impact on the road network for all elements of construction.	Volume 3 Table 10-5	Outline Traffic Management Plan (8.9)	Requirement 18
10.5	AQ	Construction	Embedded mitigation	Mitigation measures deemed appropriate for sites with a 'medium risk' have been recommended as a precautionary assumption, and are detailed in the Outline Air Quality Management Plan (AQMP) (Document 8.7.4)	Volume 3 Paragraphs 10.58, 10.70 and 10.99	Outline Air Quality Management Plan (8.7.4)	Requirement 14
10.6	AQ	Decommissioning	Embedded mitigation	Proposed implementation of a Decommissioning Traffic Management Plan to secure appropriate routing of HGVs for the decommissioning of the Intermediate Electrical Compound and Substation Compound.	Volume 3 Table 10-5	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
SECTION 3.11 NOISE AND VIBRATION							
11.1	Noise and Vibration	Construction	Embedded mitigation	Construction activities that generate potentially significant noise levels at the nearest noise sensitive receptors will generally be restricted to the hours of 07:30 to 19:00 on weekdays and 08:00 to 13:00 on Saturdays as detailed in the Code of Construction Practice (Application Document 8.7) . Other construction activities (that are not likely to generate significant levels of noise at the nearest residential properties) may still take place outside of these hours during the standard working hours periods (07:00-19:00 Mon-Sat). It may be necessary to undertake trenchless works outside these hours in very specific circumstances as a bore must be undertaken in one continuous operation. However, night-time working will be avoided wherever possible and the relevant Local Authority will be notified of any works that are necessary outside of the above hours prior to works taking place.	Volume 3 Table 11-7	Outline Code of Construction Practice (8.7) Paragraph 5.2	Requirement 14
11.2	Noise and Vibration	Construction	Embedded mitigation	All construction activities shall adhere to the best practices outlined in BS 522A8.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.6	Requirement 14
11.3	Noise and Vibration	Construction	Embedded mitigation	All construction equipment will be maintained in good working order and any associated noise attenuation measures such as engine casings and exhaust silencers shall remain fitted at all times.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.3	Requirement 14
11.4	Noise and Vibration	Construction	Embedded mitigation	Where flexibility reasonably exists, construction activities will be separated from residential neighbours by the maximum possible distances.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.3	Requirement 14
11.5	Noise and Vibration	Construction	Embedded mitigation	A Noise and Vibration Management Plan will be produced prior to the commencement of construction works detailing the measures that will be taken to control and minimise the environmental effects (including noise and vibration) of construction.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3)	Requirement 14
11.6	Noise and Vibration	Construction	Embedded mitigation	Where a TCC is to be constructed within 100 m of a residential property, temporary noise barriers will be constructed prior to the site preparation of the TCC and will remain in place until the site preparation of the TCC is completed.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.10	Requirement 14
11.7	Noise and Vibration	Construction	Embedded mitigation	Sheet steel piling will utilise vibratory piling rather than impact piling in order to reduce the noise levels that will be generated by this activity.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.5	Requirement 14
11.8	Noise and Vibration	Construction	Embedded mitigation	Trenchless works will be completed in the shortest reasonably practical timescale. Where possible, trenchless works that are likely to result in significant noise effects at nearby residential receptors will be restricted to daytime working hours on weekdays. No trenchless work will be carried out at locations within 100 m of a residential property during night time hours without the permission of the property resident. No trenchless works will be carried out at locations less than 50m from any residential property at any time.	Volume 3 Table 11-7	Outline Code of Construction Practice (8.7) Paragraph 5.2	Requirement 14
11.9	Noise and Vibration	Construction	Embedded mitigation	Temporary noise barriers will be installed around trenchless compounds in order to provide screening for sources located at low heights (note however that it is likely to be impractical to provide noise barriers that are high enough to screen the entire HDD drilling rig).	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.10	Requirement 14
11.10	Noise and Vibration	Construction	Embedded mitigation	Local residents likely to be significantly affected by noise from HDD (or other trenchless techniques) works will be kept informed of the likely period during which the work will take place, the times and durations of planned works and the measures that are being taken to avoid unnecessary noise.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.15	Requirement 14

SECTION 3 - ONSHORE MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference	Where secured (Application Document)	DCO reference
11.11	Noise and Vibration	Construction	Embedded mitigation	Residential properties located further than 100m from trenchless compounds that could experience significant night-time noise levels due to night-time works will be offered temporary re-housing for the duration of those trenchless works.	Volume 3 Table 11-7	Outline Code of Construction Practice (8.7) Paragraph 5.2	Requirement 14
11.12	Noise and Vibration	Construction	Embedded mitigation	On completion of the trenchless works at a particular location, local residents will be informed that the works are complete and noise impacts due to trenchless works will cease.	Volume 3 Table 11-7	Outline Noise and Vibration Management Plan (8.7.3) Paragraph 3.14	Requirement 14
11.12	Noise and Vibration	Operation	Embedded mitigation	The mitigation measures identified in Annexes 11-2 and 11-3 (Volume 5) will be applied. Noisy items of plant will be housed within sound insulating enclosures wherever required and practicable, with appropriate attenuation fitted to fans, air handling units, cooling equipment etc. as necessary.	Volume 3 Table 11-7	This would be secured through compliance with the noise limits imposed on the operational phase by Requirement 17	Requirement 17
11.13	Noise and Vibration	Operation	Embedded mitigation	All necessary noise attenuation measures such as enclosures, attenuators etc. will remain fitted to the relevant items of plant at all times whilst the plant is operational. All items of plant will be regularly inspected and maintained.	Volume 3 Table 11-7	This would be secured through compliance with the noise limits imposed on the operational phase by	Requirement 17
11.14	Noise and Vibration	Decommissioning	Embedded mitigation	As above for construction phase, although it should be noted that decommissioning will not require any trenched or trenchless cable route works.	Volume 3 Table 11-7	This would be secured in the onshore decommissioning plan to be submitted under Requirement 21	Requirement 21
SECTION 3.12 INTER-RELATIONSHIPS							
12.1				There are no specific mitigation measures for chapter 12 of this volume beyond those previously addressed.			
SECTION 3.13 CONCLUSIONS AND SUMMARY OF KEY ISSUES							
13.1				There are no specific mitigation measures for chapter 13 of this volume beyond those previously addressed.			

SECTION 4 - OFFSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference
				SECTION 4.1 OFFSHORE PROJECT DESCRIPTION	
1.1				There are no relevant mitigation design measures for chapter 1 of this volume	
				SECTION 4.2 MARINE PHYSICAL ENVIRONMENT	
2.1	Marine physical environment	General	Embedded mitigation	Careful routing of the offshore cable route to avoid areas of designated seabed. Of particular relevance to the assessment of effects to the marine physical environment is the position of the landfall. This has been micro-sited to avoid the Chapel Point-Wolla Bank SSSI - a nationally important geological site for its intertidal sediments, which record the evidence of early Holocene sea level change (Natural England, 2014).	Volume 2, Table 2-11
				SECTION 4.3 MARINE ORNITHOLOGY	
3.1				There are no relevant mitigation design measures for chapter 3 of this volume	
				SECTION 4.4 INTERTIDAL AND SUBTIDAL ECOLOGY	
4.1	Intertidal and Subtidal Ecology	General	Embedded mitigation	The export cable corridor route selection was made following a series of constraints analyses, with the route selected to ensure impacts upon the environment and other marine users are minimised.	Volume 2, Table 4-8
				SECTION 4.5 FISH AND SHELLFISH	
5.1				There are no relevant mitigation design measures for chapter 5 of this volume	
				SECTION 4.6 MARINE ANIMALS	
6.1				There are no relevant mitigation design measures for chapter 6 of this volume	
				SECTION 4.7 OFFSHORE CONSERVATION	
7.1	Offshore Conservation	Construction	Embedded mitigation	Route optimisation has reduced interaction with sandbank features and will further minimise any interaction with sandwave features and the need for deployment of secondary protection of cables in these areas.	Volume 2, Table 7-9
				SECTION 4.8 COMMERCIAL FISHERIES	
8.1				There are no relevant mitigation design measures for chapter 8 of this volume	
				SECTION 4.9 SHIPPING AND NAVIGATION	
9.1				There are no relevant mitigation design measures for chapter 9 of this volume	
				SECTION 4.10 OTHER MARINE USERS	
10.1				There are no relevant mitigation design measures for chapter 10 of this volume	

SECTION 4 - OFFSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase/section	Type	Mitigation	ES reference
				SECTION 4.11 MARINE HISTORIC ENVIRONMENT	
11.1				There are no relevant mitigation design measures for chapter 11 of this volume	
				SECTION 4.12 INTER-RELATIONSHIPS	
12.1				There are no relevant mitigation measures for chapter 12 of this volume	
				SECTION 4.13 CONCLUSIONS AND SUMMARY OF KEY ISSUES	
13.1				There are no relevant mitigation measures for chapter 13 of this volume	

SECTION 5 - ONSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference
				SECTION 5.1 INTRODUCTION	
1.1				There are no relevant mitigation design measures for chapter 1 of this volume	
				SECTION 5.2 LANDSCAPE AND VISUAL	
2.1	LVIA	General - project design	Embedded mitigation	Careful routing of the onshore cable route and siting of the IEC and Substation to avoid key areas of landscape sensitivity, such as the Lincolnshire Wolds AONB.	Volume 3 Paragraph 2.29 / 2.30
2.2	LVIA	Construction - IEC	Embedded mitigation	The location of the IEC avoids the loss of notable vegetation cover, and loss of landscape elements will be limited to arable crop. The temporary construction compound (TCC4) will be located directly adjacent to the construction operations, limiting its landscape and visual effects.	Volume 3 Table 2-14
2.3	LVIA	Construction - Substation	Embedded mitigation	The location of the Substation avoids the loss of notable vegetation cover and loss of landscape elements will be limited to arable crop. The temporary construction compound (TCC 25) will be located directly adjacent to the construction operations, limiting its landscape and visual effects.	Volume 3 Table 2-14
2.4	LVIA	Construction - National Grid Substation	Embedded mitigation	The Unlicensed Works will be contained within the existing hard standing and fence-line of the Bicker Fen Substation which avoids the loss of any vegetation. The temporary construction compound (TCC 26) will be located directly adjacent to the construction operations and within the wider existing substation compound.	Volume 3 Table 2-14
2.5	LVIA	Construction - onshore cable	Embedded mitigation	The design of the onshore cable route has avoided notable landscape elements, such as groups of trees and hedgerows, where possible. Where loss of a landscape element is unavoidable, the loss has been kept to a practical minimum.	Volume 3 Table 2-14
2.6	LVIA	Construction - onshore cable	Embedded mitigation	The storage of materials and vehicles will be required in a number of temporary construction compounds along the proposed onshore cable route. The location of the temporary construction compounds have been selected directly adjacent to: <ul style="list-style-type: none"> • the proposed landfall works on the landward side of the sand dunes (TCC 1) • the proposed cable route; • existing bell-mouth access where available; and • away from notable tree cover . 	Volume 3 Table 2-14
2.7	LVIA	Construction - onshore cable	Embedded mitigation	The working width during the construction phase will be confined to a corridor of no greater than 60 m to minimise the construction footprint on the landscape (except where a TCC is planned, and in the extent of the cable route which will accommodate the track from the A158 for the construction traffic to the IEC. (That section will be up to 66 m wide).	Volume 3 Table 2-14
2.8	LVIA	Construction - onshore cable	Embedded mitigation	In addition, Transition Joint Bays (TJBs) have been located away from the beach area and will be situated within inland of the sand dunes, within the onshore cable corridor in fields. Each TJB will require land raising of up to 1.5 m, however the completed TJBs will appear similar in appearance to earth bunds which are typical within the locality, beside drains, albeit smaller in scale and with two manhole covers (1.1 m2) evident above ground.	Volume 3 Table 2-14
2.9	LVIA	Construction - onshore cable	Embedded mitigation	Considering the connection to the existing Bicker Fen Substation, the cable route location and extent has been proposed to minimise loss of existing tree planting which is located on the periphery of the existing Substation compound. The entry of the cable route into the northern extent of the existing Substation compound will require some clearance of existing (albeit relatively recently planted) tree planting. However the cable route has been selected to avoid the creation of direct views through the cable corridor from nearby visual receptors to the north and north-east, such as residential receptors in Bicker Gauntlet. In addition, the working width of the proposed cable route located to the east of the existing Bicker Fen substation has been located away from mature planting adjacent to Vicarage Drive and has been limited to a maximum of 20 m to limit the loss of relatively newly planted tree planting. The operational width of the cable route will be 6 m upon which only shallow rooting species will be planted. This width has been kept to a minimum to ensure that trees (deeper rooting) can be planted within the majority of the working width	Volume 3 Table 2-14

SECTION 5 - ONSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference
2.10	LVIA	Operation - IEC	Embedded mitigation	The GIS building will be located within the 'Intermediate Electrical Building Siting Limits' as shown on Figure 2-4 and the "siting limits" have been selected to take advantage of a position between existing built developments, a grain store and Skegness Stadium, to avoid it being 'isolated' within the wider arable landscape and therefore minimising the intrusion into the open countryside south of the existing buildings on Marsh Lane and maintaining the existing building line as far as possible. The location of the Intermediate Electrical Compound is also intended to balance with the adjacent geometric field and road pattern.	Volume 3 Table 2-14
2.11	LVIA	Operation - IEC	Embedded mitigation	The access road is to be located on the western boundary of the site, running parallel with the adjacent field boundary, therefore maintaining balance with the surrounding field pattern and limiting its landscape and visual effects.	Volume 3 Table 2-14
2.12	LVIA	Operation - IEC	Embedded mitigation	Planting has been proposed at the Intermediate Electrical Compound and has been included in the project design.	Volume 3 Table 2-14
2.13	LVIA	Operation - Substation	Embedded mitigation	The location of the Substation has been selected to take advantage of its position close to the Forty Foot Drain embankment which provides a screen to views from the west. The location of the Substation is intended to balance with the adjacent geometric field and road pattern and is located close to existing electrical infrastructure such as the National Grid Bicker Fen substation, lines of pylons and Bicker Fen Wind Farm.	Volume 3 Table 2-14
2.14	LVIA	Operation - Station	Embedded mitigation	The access road is routed along field boundaries as far as is practicable to maintain balance with the surrounding field pattern and limiting its landscape and visual effects.	Volume 3 Table 2-14
2.15	LVIA	Operation - National Grid Station	Embedded mitigation	The location of the Unlicensed Works take advantage of a position within the existing hard standing and fence-line of the Bicker Fen Substation which creates a 'cluster effect' with existing electrical infrastructure. In addition, there will be an overlap between existing and proposed above ground electrical infrastructure, limiting the extension in size of the existing substation and therefore limiting landscape and visual effects.	Volume 3 Table 2-14
2.16	LVIA	Operation - National Grid Station	Embedded mitigation	Existing access roads will be utilised and no new routes are required.	Volume 3 Table 2-14
SECTION 5.3 SOCIO-ECONOMICS					
3.1	Socio Ec	General	Embedded mitigation	Avoiding settlements	Volume 3 Table 3-8
3.2	Socio Ec	General	Embedded mitigation	Cable routing process has given specific regard to avoiding areas of known built development and permanent active use including sport, leisure and recreational facilities; commercial and industrial use (including waste infrastructure); retail; residential; healthcare; education; public/institutions (including museums, galleries etc); and open space (e.g common land, parks).	Volume 3 Table 3-8
SECTION 5.4 TERRESTRIAL ECOLOGY					
4.1	Terrestrial ecology	General	Embedded mitigation	Careful routing of the onshore cable route and the positioning of the IEC and Substation to avoid key areas of ecologically sensitive habitat and designated sites for nature conservation. This has been further refined through micro-siting to avoid features identified during survey that may indicate presence of protected species.	Volume 3 Table 4-17
4.2	Terrestrial ecology	General	Embedded mitigation	The onshore cable route will be constructed in sections, enabling restriction of the timing of construction activities at specific sections to avoid disturbance to habitats and species at specific times.	Volume 3 Table 4-17
4.3	Terrestrial ecology	Construction	Embedded mitigation	The location of the Substation has been carefully selected within an area of arable habitat to avoid damaging ecologically important habitats.	Volume 3 Table 4-17
4.4	Terrestrial ecology	Construction	Embedded mitigation	The location of the IEC has been carefully selected within an area of arable habitat to avoid damaging ecologically important habitats.	Volume 3 Table 4-17
4.5	Terrestrial ecology	Construction	Embedded mitigation	The location of the Substation has been carefully selected within an area of arable habitat to avoid damaging ecologically important habitats.	Volume 3 Table 4-17

SECTION 5 - ONSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference
				SECTION 5.5 LAND USE, AGRICULTURE AND SOILS	
5.1	Land use	General	Embedded mitigation	Cable routing process has given specific regard to minimising potential impacts on agricultural land through aligning the cable route along the edges of fields where possible, to minimise temporary disruption during construction, and to minimise permanent impacts associated with the location of jointing bay link box man-hole covers.	Volume 3 Table 5-7
				SECTION 5.6 GEOLOGY, HYDROGEOLOGY AND GROUND CONDITIONS	
6.1	Geology	General	Embedded mitigation	The proposed development alignment has been selected to avoid sites of known contamination, such as historic landfills and areas of industrial activity.	Volume 3 Table 6-7
6.2	Geology	Construction	Embedded mitigation	Foundation design for the IEC and Substation components will need to consider artesian groundwater conditions should a piled foundation option be considered.	Volume 3 Table 6-7
6.3	Geology	Construction	Embedded mitigation	When designing any foundations (e.g. piling) of the development components, considerations for the use of driven or permanently cased piles should be incorporated into the design to the potential for artesian groundwater.	Volume 3 Table 6-7
				SECTION 5.7 HYDROLOGY AND FLOOD RISK	
7.1	Hydrology	Design - Onshore cable	Embedded mitigation	Careful routing of the onshore cable route to avoid key areas of sensitivity regarding flood risk, such as settlements, land allocated for significant development.	Volume 3 Table 7-10
7.2	Hydrology	Design - IEC and Substation	Embedded mitigation	Above Ground Electrical Infrastructure will be raised above the 0.1% (1 in 1000 year) probability + climate change level, to ensure that the electrical system remains operational at times of flooding.	Volume 3 Table 7-10
				SECTION 5.8 HISTORIC ENVIRONMENT	
8.1	Historic Environment	General	Embedded mitigation	Detailed design of the cable route in order to avoid all known heritage assets of the highest significance, and concentrations of all other known heritage assets where possible.	Volume 3 Table 8-7
8.2	Historic Environment	General	Embedded mitigation	HDD (or other trenchless techniques) of some (usually linear) obstacles on the cable route for engineering purposes will reduce the development impacts on certain heritage assets which happen to be coincidentally located, such as railways, parish boundaries and historic drainage systems.	Volume 3 Table 8-7
8.3	Historic Environment	General	Embedded mitigation	Trenchless technique locations outlined in the crossing schedule (Application Document 8.3), will avoid cable trenches crossing 46 known heritage assets although haul roads may still be required and a top-soil strip would need to be undertaken, albeit within a reduced corridor. Impacts can be ameliorated with the use of bog matting.	Volume 3 Table 8-7
8.4	Historic Environment	General	Embedded mitigation	Advance geophysical survey and trial trenching embedded in project programme, the scope of which is subject to further discussion with statutory consultees and agreement of targets as described in the Outline WSI (Application Document 8.11).	Volume 3 Table 8-7
				SECTION 5.9 TRAFFIC AND ACCESS	
9.1	Traffic	Project	Embedded mitigation	Avoiding settlements; Use of trenchless techniques at appropriate locations; consideration of timing of all works to reduce impacts	Volume 3 Table 9-16
9.2	Traffic	Construction	Embedded mitigation	Careful location of the temporary construction compounds for the cable route to minimise use of minor roads.	Volume 3 Table 9-16
				SECTION 5.10 AIR QUALITY	
10.1	AQ	General	DO to secure AQMP. Embedded mitigation.	Project designed to avoid residential dwellings and areas of sensitivity.	Volume 3 Table 10-5

SECTION 5 - ONSHORE DESIGN MITIGATION

Mitigation reference	Chapter	Phase / section	Type	Mitigation	ES reference
10.2	AQ	Construction	Embedded mitigation.	Consideration regarding the location of temporary construction compounds to minimise the use of minor roads.	Volume 3 Table 10-5
SECTION 5.11 NOISE AND VIBRATION					
11.1	Noise and Vibration	Project Design	Embedded mitigation	Routing of the onshore cable route and locations of Intermediate Electrical Compound and Substation to avoid key areas of sensitivity.	Volume 3 Table 11-7
11.2	Noise and Vibration	Operation	Embedded mitigation	The cable route between landfall, the Intermediate Electrical Compound and the Substation will consist of buried cable rather than overhead lines, removing the possibility of any operational noise effects from the cable route.	Volume 3 Table 11-7
11.3	Noise and Vibration	Operation	Embedded mitigation	Where flexibility exists, the layout of the compounds that accommodate the above ground electrical infrastructure at the Intermediate Electrical Compound and Substation sites will be chosen such that potentially noisy items of plant are separated from residential receptors by the maximum possible distances.	Volume 3 Table 11-7
SECTION 5.12 INTER-RELATIONSHIPS					
12.1				There are no specific mitigation design measures for chapter 12 of this volume beyond those previously addressed.	
SECTION 5.13 CONCLUSIONS AND SUMMARY OF KEY ISSUES					
13.1				There are no specific mitigation design measures for chapter 13 of this volume beyond those previously addressed.	