

King's Lynn B Connection Project

Report of Route Corridor Preference

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<u>CONTENTS</u>	<u>PAGE No.</u>	
1	PURPOSE OF REPORT	3
2	BACKGROUND TO THE PROPOSAL	3
3	POTENTIAL ROUTE CORRIDORS	8
4	FACTORS CONSIDERED IN EVALUATING ROUTE CORRIDOR OPTIONS	9
5	POLICY CONTEXT	10
6	STATUTORY DUTIES	18
7	CONSULTATION RESPONSES	20
8	REGARD FOR STATUTORILY DESIGNATED AREAS	30
9	REGARD FOR LANDSCAPE CHARACTER AND VISUAL AMENITY	35
10	REGARD FOR CULTURAL HERITAGE	40
11	REGARD FOR ECOLOGY AND BIODIVERSITY	42
12	REGARD FOR LAND USE	44
13	ENGINEERING	45
14	INALIENABLE AND COMMON LAND	48
15	AVIATION	49
16	CUMULATIVE IMPACTS	49
17	FLOOD RISK/CLIMATE CHANGE RESILIENCE	49
18	SOCIO-ECONOMIC	50
19	LAND VALUE	51
20	HEALTH	51
21	COST	51
22	REVIEW OF STRATEGIC OPTIONS	52
23	CONCLUSIONS AND RECOMMENDATION	54
24	NEXT STEPS	57
	APPENDIX A: PYLON (TOWER) TYPES	58
	APPENDIX B: MAP OF THE THREE ROUTE CORRIDORS	62
	APPENDIX C: DETAILS OF ALLOCATIONS WITHIN LOCAL PLAN	63
	APPENDIX D: MAP OF THE PREFERRED ROUTE CORRIDOR	64
	APPENDIX E: ABBREVIATIONS	65

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1 PURPOSE OF REPORT

- 1.1 This report makes a recommendation to a committee of National Grid Electricity Transmission plc (referred to in this report as "National Grid") regarding the selection of a preferred route corridor for a proposed 400kV connection between Centrica's proposed new 981 megawatts (MW) combined cycle gas turbine power station at King's Lynn in Norfolk (King's Lynn B Power Station), which was granted consent under Section 36 of the Electricity Act in February 2009, and the National Grid high voltage electricity transmission system. The report shows how statutory duties, policy considerations, technical, environmental and socio-economic issues and the results of consultation feedback have shaped and influenced that recommendation.
- 1.2 The report first summarises the background to the proposal and outlines the process of option development and assessment. Each of the three potential route corridors is then described. The report identifies and assesses the factors taken into account in the route corridor selection process. Finally, a recommendation is reached on the preferred route corridor within which a detailed route alignment (the actual route of the power transmission line) should be developed.

2 BACKGROUND TO THE PROPOSAL

National Grid

- 2.1 National Grid owns the high voltage electricity transmission system in England and Wales, and is responsible for its operation across Great Britain. The system operates mainly at 400,000 and 275,000 volts, connecting the electricity generators to substations where the high voltages are transformed to lower voltages, enabling the power to be distributed to homes and businesses by Distribution Network Operators who operate at a maximum of 132,000 volts. The Distribution Network Operator in East Anglia at the time of the stage one consultation was EDF, this network has subsequently been sold and is now known as UK Power Networks.

The Need for the Connection

- 2.2 On 20th September 2007 Centrica submitted an application to National Grid requesting connection to the transmission system of a new 981MW Combined Cycle Gas Turbine (CCGT) power station sited south of King's Lynn in Norfolk. Centrica Ltd required a scheme connection date of 31st October 2014. In accordance with National Grid's licence obligations, a connection offer was made in December 2007.
- 2.3 Although the National Grid electricity transmission system passes near the proposed location of the new Kings Lynn B power station there is currently no direct connection. A new connection is therefore required.

2.4 The nearest part of the transmission system is some 2.0km south of the power station where a 400kV double circuit passes. This circuit connects the 400kV substations at Walpole and Norwich Main. Walpole is approximately 10-15km from Kings Lynn B and Norwich Main approximately 50-60km. A more detailed explanation of the need for the project is contained within the project need case¹

Project Development Process

2.5 Developing a scheme to enable the generation at King's Lynn to be accommodated within the National Grid involves the following main stages:

- Strategic optioneering - to determine appropriate solutions for further development
- Route corridor studies - to define potential route corridors, taking environmental constraints into account
- First stage consultation - to obtain the views of statutory bodies, other agencies and the general public on the potential route corridors
- Back checking of options - taking the opportunity before corridor selection to ensure all options considered are relevant and the selection process remains valid
- Route corridor preference - to select which of the potential route corridors should be preferred, based on a range of technical, environmental and other criteria (the subject of this report and recommendation)
- Route alignments - definition of potential route alignment(s) and tower (pylon) locations within the preferred route corridor
- Stage two consultation - to obtain the views of statutory bodies, other agencies and the general public on the potential route alignment(s) and tower (pylon) locations
- Assessment - environmental impact assessment of potential route alignment(s) and (tower) pylon locations and finalisation of proposed scheme
- Stage three consultation – obtain views of the statutory bodies, other agencies and the general public on the proposed application and its contents.

¹ Connection of King's Lynn B – Project Need Case, National Grid.

- Internal approval is sought from a committee of National Grid for submission of recommended project.

Strategic Optioneering

- 2.6 National Grid considered a wide range of connection options which could connect the power station. A number of options were evaluated at workshops, involving representatives of the systems development, engineering and consents teams from National Grid and its alliance partners. The results of the strategic optioneering exercise are contained in a separate report².
- 2.7 The strategic optioneering exercise concluded that two broad options should be taken forward to Route Corridor Studies, each involving an overhead line between King's Lynn B power station and the existing Norwich-Walpole overhead line. The first option would involve a connection between a new 400kV substation at the power station site and the existing 400kV overhead line which runs between Walpole 400kV and Norwich Main 400kV via approximately 2.5km of new 400kV overhead line. The second option considered a connection that was greater in length than the first option but still complied with system requirements and licence obligations.

Route Corridor Study

- 2.8 A Route Corridor Study, recommended by the strategic optioneering exercise, was commissioned from environmental consultants TEP to identify possible route corridors between the connection points at King's Lynn and the existing overhead line and to assess how these performed against National Grid's statutory environmental obligations. A detailed desk-based assessment, supplemented with site visits, was used to identify route corridors which seek to avoid environmental constraints. The Route Corridor Study³ is separately reported.

The Route Corridor Study was used to generate potential route corridors and also offered a comparison of them, taking into account National Grid's commitments as set out in its Stakeholder, Community and Amenity policy⁴. In particular, it considered the potential impacts on environmental constraints within and in the wide vicinity of the study area (please see Appendix E for abbreviations):

- SSSIs/SPAs/SACs/Ramsar sites/NNRs

² National Grid : King's Lynn connection project : Strategic Optioneering Report : April 2010

³ National Grid : King's Lynn connection project : Route Corridor Study for Public Consultation : February 2010

⁴ National Grid plc : National Grid's commitments when undertaking works in the UK - our Stakeholder, Community and Amenity policy : February 2010

- Woodlands
- Scheduled monuments
- Settlements, including conservation areas and listed buildings
- Minerals sites
- Airfields
- Topography
- Landscape character, including impact on historic landscape; and
- Views

2.9 The Route Corridor Study identified three broad corridors between King's Lynn B Power station and the existing Norwich – Walpole overhead line: East, Central and West Corridors.

2.10 It is considered that it would be technically feasible to construct an overhead line in any of these corridors.

2.11 The Route Corridor Study identified the East Corridor as least environmentally-constrained when considered against the criteria used in identifying corridors. However, no firm preference was stated as it was recognised that advice, concern and opinions gathered during consultation would be important considerations and would help to determine the key factors in selecting a preferred route corridor.

Consultation

2.12 The findings of the Route Corridor Study formed the basis for an extensive consultation exercise. This was carried out in accordance with a Statement of Community Consultation⁵ which was prepared in consultation with King's Lynn and West Norfolk Borough Council and Norfolk County Council. It was informed by relevant government guidance, specifically Department of Communities and Local Government's 'Consultation on the Pre-Application

⁵ National Grid : King's Lynn Connection Project : Statement of Community Consultation : February 2010

Consultation and Application Procedures for Nationally Significant Infrastructure Projects⁶, and the relevant local authorities' Statements of Community Involvement.

2.13 The consultation on route corridor options was carried out between 22nd February 2010 and 7th May 2010 and included:

- A series of public consultation events at three venues in the local area
- Project briefing meetings with the Borough Council and parish councils
- Project briefing meetings with the local authorities
- Consultation with a wide range of statutory and non-statutory organisations including the Environment Agency, Natural England and English Heritage

Back-checking process

2.14 Following the completion of the various stages outlined above National Grid has taken the opportunity to review a number of factors and scenarios that were established to the beginning of the project development process to ensure that the options initially pursued are still the right options. This involved a review of the environmental, socio-economic and whole life costs impacts of each of the strategic options.

2.15 Roger Tym & Partners were appointed to undertake a review of the socio-economic impacts⁷ of the strategic options. The report broadly concluded that there were little, if any, socio-economic reasons to differentiate the strategic options presented.

2.16 Another background paper has been produced by National Grid entitled "Review of Connection Options including Underground Cable Options"⁸. Whilst it appraises the environmental and capital costs of two possible underground connections it also reviews the whole life costs of all the strategic options. The conclusions that have been drawn from this background work are that neither of the variants on the underground option would present an environmentally or economically preferable solution to that carried forward to the consultation exercise and therefore that the original option selection remains valid.

⁶ Department of Communities and Local Government : Planning Act 2008 Consultation on the Pre-Application Consultation and Application Procedures for Nationally Significant Infrastructure Projects : March 2009

⁷ King's Lynn B Connection – Socio-Economic review for the Strategic Options, Roger Tym & Partners

⁸ King's Lynn B Connection – Review of Connection Options including Underground Cable Options, National Grid

- 2.17 As a result of this comprehensive review of the options considered and their economic, socio-economic and environmental impacts. National Grid considers that the findings and options taken forward to be the subject of the Route Corridor Study were arrived at having a sound evidence base.
- 2.18 We are also mindful of the independent review that is currently being undertaken jointly by the energy consultancy KEMA and the Institution of Engineering and Technology (IET) comparing the costs of laying power transmission cables under the ground, in tunnels and under the sea against the costs of building new overhead lines. The results of the review are set for release in the early part of 2011. The project team will review the recommendations made within this document in due course as a result of the KEMA and IET findings and take them into account as considered appropriate. It is not considered that at this stage it is necessary or appropriate to delay the consultation process pending the outcome of that review.

3 POTENTIAL ROUTE CORRIDORS

- 3.1 The three potential route corridors are outlined below and shown in Appendix B.

West Corridor

- 3.2 In this option the overhead line would leave the power station and head west, crossing the River Ouse and the Ouse Relief Channel, and then travel broadly south-west to meet the existing Norwich to Walpole overhead line. This option would be approximately 4km (2.5 miles) long.

Central Corridor

- 3.3 This corridor runs between Saddle Bow and the River Ouse. In this option the overhead line would leave the power station in a south-westerly direction, crossing the Ouse Relief Channel before heading south to meet the Norwich to Walpole overhead line. This option would be approximately 2.5km (1.5 miles) long.

East Corridor

- 3.4 This corridor stretches between the Ouse Relief Channel and West Winch and includes the River Nar and the railway line. In this option the line would leave the power station in a south-easterly direction towards the Norwich to Walpole overhead line. This option would be approximately 2.8km (1.75 miles) long.
- 3.5 All three corridors are within the boundary of King's Lynn and West Norfolk Borough Council and Norfolk County Council.

4 FACTORS CONSIDERED IN EVALUATING ROUTE CORRIDOR OPTIONS

4.1 This section of the report outlines the factors which have been considered in evaluating the route corridor preferences for a new overhead line between King's Lynn B Power Station and the existing overhead line. The reasoning and justification surrounding each factor can be found in the subsequent sections:

- Policy Context
- Statutory Duties
- Consultation Responses
- Statutorily Designated Areas
- Landscape Character and Visual Amenity
- Cultural Heritage
- Ecology and Biodiversity
- Land Use
- Engineering
- Inalienable and Common Land
- Aviation
- Cumulative Impacts
- Flood Risk/Climate Change Resilience
- Socio-Economic
- Land value
- Health
- Cost
- Review of Strategic Options

5 POLICY CONTEXT

National planning policies:

National Policy Statements

- 5.1 The IPC is obliged to determine applications in accordance with the prevailing National Policy Statements. In the absence of adopted NPS, decisions on applications will rest with the Secretary of State. The Secretary of State will consider the application in light of relevant government policy at national and regional level alongside policies set out in adopted development plans. Section 105 of the Planning Act 2008 sets out the provisions if the Secretary of State is to be the decision maker on applications for an order, stating that the Secretary of State must have regard to:

'(a) any local impact report (within the meaning given by section 60(3)) submitted to the Commission before the deadline specified in a notice under section 60(2),

(b) any matters prescribed in relation to development of the description to which the application relates, and

(c) any other matters which the Secretary of State thinks are both important and relevant to the Secretary of State's decision'

- 5.2 Draft National Policy Statements consulted upon by the previous Government have now been reissued for a further period of consultation by the current Government. Whilst these are draft documents for consultation they are still material considerations for the decision maker, as advised within the Department for Communities and Local Government guidance to Local Authorities.⁹
- 5.3 The Overarching National Policy Statement for Energy (EN-1)¹⁰ is part of a suite of revised National Policy Statements (NPS) including EN-5 (Electricity Networks Infrastructure) issued in draft by the Secretary of State for Energy and Climate Change in October 2010, with a consultation period extending to 24 January 2011.
- 5.4 In respect of the need for new electricity network infrastructure the draft EN-1 at paragraph 3.7.2 notes that "*construction of new lines of 132kV and above will be needed to meet the*

⁹ Planning Act 2008: Guidance for local authorities, CLG, March 2010, para 73.

¹⁰ Department for Energy and Climate Change : Draft Overarching Energy National Policy Statement : October 2010

significant national need for expansion and reinforcement of the UK's transmission and distribution networks".

5.5 It also notes at paragraph 3.7.10, that the IPC is advised to assume that an overhead line is needed in the case where it represents an efficient and economical means of connecting a new generating station to the transmission or distribution network.

5.6 The draft NPS also discusses how projects should be assessed and the potential for mitigating adverse effects. These generic impacts are dealt with in paragraph 5 of EN-1 under the following headings:

- Air quality and emissions
- Biodiversity and geological conservation
- Civil and military aviation and defence and defence interests
- Coastal change
- Dust, odour, artificial light, smoke, steam and insect infestation
- Flood risk
- Historic environment
- Land use including open space, green infrastructure and Green Belt
- Noise and vibration
- Social economic
- Traffic and transport impacts
- Waste management
- Water quality and resource

5.7 These are augmented in the draft National Policy Statement for Electricity Networks Infrastructure (EN-5)¹¹, in respect if

- Biodiversity and geological conservation
- Landscape and visual
- Noise and vibration

EN-5 also sets out technology specific consideration in respect of the impact of EMFs.

5.8 The draft NPS does not seek to direct applicants to particular sites or routes for electricity networks infrastructure. It notes that the general location of electricity network projects is often determined by the location, or anticipated location, of a particular generating station in relation to the existing network. The draft NPS recognises that the most direct route for a new connection may not be the most appropriate given engineering and environmental considerations.

5.9 The draft NPS notes that the IPC should in particular expect applicants to demonstrate good design in respect of landscape and visual amenity and in the design of the project to mitigate impacts such as noise and electric and magnetic fields.

5.10 Resilience to climate change is highlighted as a key issue and the draft NPS advises that applicants should in particular set out how the proposal would be resilient to:

- flooding, particularly for sub-stations that are vital for the electricity transmission and distribution network;
- effects of wind and storms on overhead lines;
- higher average temperatures leading to increased transmission losses; and
- earth movement or subsidence caused by flooding and drought for underground cables.

5.11 In relation to biodiversity and geological considerations, EN-5 refers to EN-1 in which the IPC is advised to ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species, habitats and other species of principal

¹¹ Department for Energy and Climate Change : Revised Draft National Policy Statement for Electricity Networks Infrastructure : October 2010

importance for the conservation of biodiversity; and to biodiversity and geological interest within the wider environment.

- 5.12 EN-5 refers specifically at paragraph 2.7.1 to the potential for bird collision with overhead lines and noting the possibility of death through electrocution. The IPC is advised to ensure this matter has been considered in the Environmental Statement and that appropriate mitigation measures will be taken.
- 5.13 The draft NPS supports the continued application of the Holford Rules to guide the selection of routes for overhead lines. It states that the IPC should bear them and any updates in mind as they examine applications for overhead lines.
- 5.14 In discussing the undergrounding of lines, the draft NPS states that "*the IPC will need to weigh the reductions in visual intrusion against the impacts (economic, environmental and social) and technical challenges of undergrounding*" at paragraph 2.8.7.
- 5.15 It also advises that consent should only be refused on the basis that undergrounding is preferable where the benefits outweigh any economic, social and environmental impacts and the technical difficulties are surmountable. The implications of undergrounding the connection has already been addressed in section 2.
- 5.16 In respect of noise from overhead lines, the draft NPS notes that this is unlikely to lead to the IPC refusing an application but it may need to consider the use of appropriate conditions to ensure noise is minimised as far as possible. It is therefore considered that noise would not influence route corridor selection, but may influence the selection of the eventual route alignment.
- 5.17 The draft NPS notes that the balance of scientific evidence over several decades of research has not proven a causal link between EMFs and cancer or any other disease. Furthermore, the Department of Health's Medicines and Healthcare Products Regulatory Agency does not consider that transmission line EMFs constitute a significant hazard to the operation of pacemakers. There is little evidence that exposure of crops, farm animals and natural ecosystems to transmission line EMFs would have any agriculturally significant consequences.
- 5.18 The draft NPS notes that the International Commission on Non-Ionising Radiation Protection (ICNIRP) has developed health protection guidelines¹² for both public and occupational exposure. Regulations governing the minimum height, position, insulation and protection

¹² International Commission on Non-Ionising Radiation Protection : Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields : 1998

specifications of conductors to ensure clearance of objects mean that power lines at or below 132kV will comply with the ICNIRP guidelines. Where applications for new 275kV and 400kV overhead lines or underground cables are involved, the IPC will need to be satisfied that the ICNIRP basic restrictions for public exposure will not be reached or exceeded for any residential accommodation along the route of the line. It is therefore considered that EMF would not influence route corridor selection, but may influence the selection of the eventual route alignment.

Planning Policy Statements

5.19 Planning policy guidance notes (PPGs) and their replacements, Planning Policy Statements (PPSs), are prepared by the government after public consultation to explain statutory provisions, providing guidance to local authorities and others on planning policy and the operation of the planning system. They are material considerations in determining applications for development. The following list details the documents include those that have been considered in selecting a preferred route corridor:

- **Planning Policy Statement 1: Delivering Sustainable Development**¹³
- **Planning and Climate Change: Supplement to Planning Policy Statement1**¹⁴
- **Planning Policy Statement 4: Planning for Sustainable Economic Growth**¹⁵
- **Planning Policy Statement 5: Planning for the Historic Environment**¹⁶
- **Planning Policy Statement 7: Sustainable Development in Rural Areas**¹⁷
- **Planning Policy Statement 9: Biodiversity and Geological Conservation**¹⁸

¹³Planning Policy Statement 1: Delivering Sustainable Development : Office of the Deputy Prime Minister : January 2005

¹⁴Planning and Climate Change: Supplement to Planning Policy Statement 1 : Department for Communities and Local Government : December 2007

¹⁵ Planning Policy Statement 4: Planning for Sustainable Economic Growth: December 2009

¹⁶Planning Policy Statement 5: Planning for the Historic Environment : Department for Communities and Local Government : March 2010

¹⁷Planning Policy Statement 7: Sustainable Development in Rural Areas : Office of the Deputy Prime Minister : August 2004

- **Planning Policy Guidance Note 13: Transport**¹⁹
- **Planning Policy Statement 22 Renewable Energy**²⁰
- **Planning Policy Guidance Note 24 Planning and Noise**²¹
- **Planning Policy Statement 25 Development and Flood Risk**²²

It is concluded that, in this case, none of the above Planning Policy Statements had a material influence on the preferred choice of route corridor.

Regional planning policies

- 5.20 Regional planning policies are contained in the **East of England Plan**²³. These include polices focussed upon sustainability, landscape protection and economic development. it is recognised that these polices are likely to be replaced by a National Planning Policy Framework, which will be taken into account in further decisions where considered appropriate.

Development Plan

- 5.21 The area covered by the three route corridors lies within King's Lynn and West Norfolk Borough Council which in turn is within Norfolk County Council.

Norfolk Structure Plan 1993

- 5.22 The Norfolk Structure Plan was previously the county level development plan covering the study area. The 2004 Planning and Compulsory Purchase Act removed Norfolk County Council's responsibility to prepare and implement a structure plan. However, some policies from this plan have been 'saved' for a specified period and will expire once Local Development Frameworks (LDFs) are in place.

¹⁸Planning Policy Statement 9: Biodiversity and Geological Conservation : Office of the Deputy Prime Minister : August 2005

¹⁹ Planning Policy Guidance Note 13 Transport: Department for Communities and Local Government : January 2011

²⁰Planning Policy Statement 22 Renewable Energy : Office of the Deputy Prime Minister : August 2004

²¹Planning Policy Guidance Note 24 Planning and Noise : Office of the Deputy Prime Minister : September 1994

²²Planning Policy Statement 25 Development and Flood Risk : Department for Communities and Local Government : March 2010

²³ East of England Plan The revision to the Regional Spatial Strategy for the East of England : Government Office for the East of England : May 2008

5.23 Saved Policy ENV3- Landscape from the Structure Plan states:

'In the areas of important landscape quality, the Brecks, the river valleys, the remaining length of undeveloped coast, the Wash area, historic parks and gardens and their settings, broadleaved woodland, heath and common land, proposals for development will only be acceptable where they can be shown to conserve and are sensitive to the appearance and character of these areas'

King's Lynn and West Norfolk Borough Local Plan 1998

5.24 This is the statutory development plan for the King's Lynn area. The Council is in the process of devising its LDF and has been consulting on the Core Strategy element during 2009. In the interim some policies from the local plan have been 'saved' until such time as LDF polices and documents are prepared and adopted.

5.25 The following sections highlight saved policies from the Local Plan which affect the study area and land adjacent. The Local Plan allocates land which is considered appropriate for development.

5.26 The Proposals Plan (Appendix C) highlights two areas deemed appropriate for employment and housing south of King's Lynn which are adjacent or partly within the study area. Under Policy 5/25 land lying within the study area at the 'Lynn South Expansion Area' is allocated. A linear piece of land to the east of the River Nar and alongside the King's Lynn to Ely and Cambridge railway line, approximately 1km from King's Lynn Power Station, is allocated for housing. This land is not within the East Corridor as housing is not compatible with overhead line developments on amenity grounds. An employment allocation adjacent to the western edge of the housing application is included within the East Corridor as this land use is compatible with new overhead line developments. An existing 132kV overhead line intersects the northern edge of this allocated sites heading north-east from the power station.

5.27 Policy 4/6: Area of Important Landscape Quality highlights the need to protect areas of locally important landscapes. This policy identifies two types of landscape areas: 'confined' and 'open'. The 'confined' area includes an area at the eastern edge of the study area. The 'open' areas include the reclaimed marshes and fens adjacent to the River Great Ouse and covers the majority of the study area.

Policy 4/7 seeks to protect some of the 'less well researched' landscape features of the area including Marshland Drovers although little information is given regarding the nature of these. In the countryside to the south west of King's Lynn there are a number of linear strips of land between villages which are identified as Marshland Drovers. The policy states that:

'the Council will seek to protect and, where appropriate, enhance features of value to the landscape like the Marshland Drove'.

5.28 A Borough-wide Landscape Character Assessment was undertaken in 2007 and is cited in the Draft Core Strategy.

5.29 In addition the saved policies of the Local Plan also included policies focussed upon economic development, nature conservation, heritage and the principles of sustainable development.

Local Development Framework (LDF)

5.30 LDF documents have not yet been adopted by the Council but these are given increasing weight in decision-making as they pass through stages towards adoption. These draft policies are also considered where relevant to landscape and a proposed overhead line connection.

5.31 The Council has prepared a Core Strategy which comprises overarching development policies for King's Lynn and West Norfolk. This was submitted to the Secretary of State in late 2010 the Public Inquiry commenced in February 2011. The Council's vision for the future puts the environment and local distinctiveness high on its agenda for the future. The consultation version of the Core Strategy document states in relation to the environment:

'We want to safeguard our justifiably famous natural and historic environment, at the same time making sustainability a central principle to our vision. We want to build connections with other local and regional economies, reduce reliance on the car, and prepare ourselves for the challenges of climate change.'

5.32 Targets for up to 2030 include:

'West Norfolk has undergone regeneration and growth that complements its high quality historical and natural inheritance; Communities in West Norfolk benefit from quality public spaces and parks with access to the coast and countryside that make the area special; and West Norfolk still feels like somewhere unique in its own right, based on its own local distinctiveness.'

5.33 Policy 13 of the Core strategy states the council's approach to Landscape Character Assessment (LCA) in considering future development in the borough. The Council has undertaken a borough-wide LCA and will use this in the decision making process. The policy states:

'Proposals for development should be informed by, and be sympathetic to, the distinctive character areas identified in the King's Lynn and West Norfolk Landscape Character Assessment. Development proposals should demonstrate that their location, scale, design and materials will protect, conserve and, where possible, enhance the special qualities and local distinctiveness of the area (including its historical, biodiversity and cultural character), gaps between settlements, landscape setting, distinctive settlement character, landscape features and ecological networks.'

- 5.34 National Grid is also aware of early proposals to incorporate a potential growth point to the east of West Winch within the Core Strategy. This could include revisions to the identified housing and employment allocations within the current Local Plan. The Borough Council have indicated that any site specific documents within the LDF will not be available for consultation until March 2011. Any emerging proposals will be taken into account as appropriate as part of the continuing consultation process.

Policy Conclusions

- 5.35 It is clear that the principle for new energy infrastructure has been established at a national level. In terms of policy considerations alone, there is little to choose between the three corridor options. Due to the close geographical proximity of the three corridors are minimal policy implications within between them. The principles underlying the policies are taken into account in assessing the potential impact on the project.

6 STATUTORY DUTIES

Electricity Act 1989

- 6.1 Section 9 of the Electricity Act 1989²⁴ places an obligation on National Grid to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.
- 6.2 Section 38 and Schedule 9 of the Electricity Act requires National Grid, when formulating proposals for new lines and other works, to:

'...have regard to the desirability of preserving natural beauty, of conserving flora, fauna, and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and shall do what [it] reasonably can

²⁴ Electricity Act 1989 c29

to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects'

- 6.3 National Grid is under a duty by virtue of section 6 of the Electricity Act 1989 to comply with the terms contained in its transmission licence. National Grid is required to plan, develop and operate its transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETSQSS)²⁵. It is required to offer and honour terms for connection of new generation which do not conflict with this obligation²⁶.

Planning Act 2008

- 6.4 The application for a Development Consent Order will be made under the 2008 Act. The 2008 Act requires applicants to undertake consultation with local authorities, other prescribed organisations, and the local community in advance of any Development Consent Order application to the Infrastructure Planning Commission and to ultimately explain how feedback from the consultations has influenced the proposal that goes forward to the Infrastructure Planning Commission.
- 6.5 National Grid has integrated its amenity duties and its community and stakeholder engagement duties into one Stakeholder, Community and Amenity policy²⁷ which covers how it will meet these duties.
- 6.6 The Infrastructure Planning (Decisions) Regulations 2010²⁸ sets out additional regulations regarding issues which must be taken into account by decision makers in certain circumstances. Relevant to the current proposal are Regulations 3 and 7. Regulation 3 states that the decision maker shall have regard to the desirability of:
- preserving listed buildings or their setting or any features of special architectural or historic interest which they possess;
 - preserving or enhancing the character or appearance of conservation areas;
 - preserving scheduled monuments or their settings.

²⁵ National Electricity Transmission System Security and Quality of Supply Standard Version 2.0 : 24/06/09

²⁶ Based upon the Ofgem consultation of 8th May 2009, National Grid may also apply to Ofgem, in restricted circumstances, to be derogated in its connection to new users, provided it can demonstrate a manageable solution not giving rise to excessive cost and not compromising other obligations including Nuclear Site Licences. Such 'connect and manage' positions will only be deemed acceptable by the regulator if the works restore compliance with the NETSQSS.

²⁷ National Grid plc :National Grid's commitments when undertaking works in the UK - our Stakeholder, Community and Amenity policy : February 2010

²⁸ Infrastructure Planning (Decisions) Regulations 2010 : SI 2010 No.305

- 6.7 Regulation 7 states that the decision maker shall have regard to the United Nations Environment Programme Convention on Biological Diversity²⁹, one of whose objectives is the conservation of biological diversity.
- 6.8 No other matters had been prescribed by Regulations at the time of the production of this report.
- 6.9 Changes are however proposed in the Localism Bill which are not presently law and at this stage do not affect the current proposal and application process.

7 CONSULTATION RESPONSES

- 7.1 National Grid carried out a comprehensive consultation exercise which detailed in full in the Stage One Feedback Report³⁰. The first stage of consultation commenced on 22nd February 2010. Public responses received since this date have been taken into account.
- 7.2 The recommendation of the preferred route corridor has taken account of the advice, concerns and opinions of stakeholders, including statutory bodies and the public in the context of National Grid's statutory responsibilities to consider economic issues, system efficiency (including system compliance and deliverability) and impact on amenity.³¹

²⁹ United Nations Environment Programme : Convention on Biological Diversity : December 1993

³⁰ National Grid; King's Lynn B Connection Project , Stage One Feedback Report

³¹ National Grid plc :National Grid's commitments when undertaking works in the UK - our Stakeholder, Community and Amenity policy : February 2010

7.3 The following is a summary of the responses that have been received during consultation. The initial table below summarises corridor preferences, where one has been expressed..

By Whom	Corridor Preference		
	West	Central	East
Norfolk County Council			✓
RSPB			✓
Natural England			✓
English Heritage			✓
Environment Agency	✓		✓
King's Lynn Internal Drainage Board			✓
Water Management Alliance		✓	✓

7.4 Where a preference has been clearly expressed by a consultee, other than the general public, all of them indicated or included a preference for the East Corridor. In the case of the Environment Agency and the Water Management Alliance this was shared with the West and Central Corridors respectively.

7.5 King's Lynn and West Norfolk Borough Council did not express a preference.

7.6 Natural England stated that the least environmentally damaging option would be the East Corridor with an alignment to the west of the River Nar.

7.7 In terms of the issues that were raised by the consultees that responded these are detailed by topic area in the following tables. The implication and consideration of these issues are addressed in sections 8 -22 of this report.

Issues and Comments re: Cultural Heritage	Consultee (Statutory and Non-Statutory)
Impact on listed buildings and conservation assets	English Heritage, King's Lynn and West Norfolk Borough Council

Development/socio-economic	Consultee (Statutory and Non-statutory)
Impact on designated waste sites – See Appendix 21	Norfolk County Council
Impact on planned development opportunities	East of England Development Agency
Impact on economic development in selecting one of the options for route of the line	East of England Development Agency
Proposal to develop a form of energy generation on land adjacent to the River Great Ouse	Environment Agency

Environment	Consultee (Statutory and Non-Statutory)
Impact on local landscape	Norfolk County Council, Natural England
The Central Corridor would avoid crossing Fen Rivers Way and Nar Valley Way	Natural England
EIA should consider the cumulative impact on the Areas of Outstanding Natural Beauty (AONB) North Norfolk Coast and off shore wind farms	Natural England
Avoid crossing over Great Ouse and relief channel	Natural England
Need to avoid environmentally damaging impacts. The Central Corridor would avoid crossing Fen Rivers Way and Nar Valley Way	Natural England
Ensure that the River Nar and its banks are not adversely affected	Environment Agency
Potential silt contamination of surface waters	Environment Agency
The potential for pollution from surface/underground works expressed	King's Lynn and West Norfolk Borough Council, Environment Agency
Request that consideration be given to drainage infrastructure in the West Corridor, if taken forward	King's Lynn Inland Drainage Board
Noted presence of Fen Rivers Way, Nar Valley Way and National Cycle Route 1 (NCN1) in the proposed route corridors	Natural England
Recommends consultation with Sustrans	Natural England
Minimise disruption of public footpaths and cycleways	Natural England
Advanced notification of potential closures or diversions of routes	Natural England

Severe harm to landscape as enjoyed from numerous highways and public paths	Open Spaces Society
Flooding	Consultee (Statutory and Non-Statutory)
Potential flood risk	Environment Agency
Highlight the need for a Flood Risk Assessment for the substation	Environment Agency
Potential need for flood defence consent	Environment Agency
Health	Consultee (Statutory and Non-Statutory)
Health (including guidance notes on EMFs)	Health Protection Agency
General health concerns	Three members of the public
Land use and property	Consultee (Statutory and Non-Statutory)
Notification of land ownership	Environment Agency
Minimise impact on dwellings	King's Lynn and West Norfolk Borough Council
Proximity of a new overhead line to housing	32 members of the public
Comments received concerned about the impact a new overhead line would have upon existing land uses	Nine members of the public
Mitigation	Consultee (Statutory and Non-Statutory)
Community benefits package	Norfolk County Council
General mitigation	Norfolk County Council
Landscape mitigation	Norfolk County Council
If the connection is an overhead line expects bird deflectors to be added to all routes	RSPB, Norfolk County Council
Make provision for adding bird deflectors to existing lines	RSPB
Transport	Consultee (Statutory and Non-Statutory)
Traffic, including access requirements and implications	King's Lynn and West Norfolk Borough Council
Need to minimise impact of construction work	Norfolk County Council
Pre-condition road survey and traffic management plans	Norfolk County Council
Ensure potential impact of chosen option is assessed in accordance with policy requirements of 02/2007 (unlikely that any options would have a significant direct	Highways Agency

impact on the A47)	
Access implications of the National Cycle Network (NCN1) to be assessed at EIA stage	Natural England
Concerns regards impact on private airstrip and helicopter flight paths the Queen Elizabeth Hospital	Two members of the public

Undergrounding	Consultee (Statutory and Non-Statutory)
Indication of preference for the use of cable under the River Great Ouse and its Relief Channel, if these are to be crossed	Environment Agency
Ideal solution is to underground the cables	RSPB
Undergrounding should be considered	East of England Local Government Association
Indicated a preference for the line to be placed underground	Seven members of the public

Visual Impact	Consultee (Statutory and Non-Statutory)
Requests that an assessment of effects on views from National Cycle Route 1 (NCN1) be included in EIA	Natural England
Minimise number of pylons	King's Lynn and West Norfolk Borough Council
That a new overhead line is ' <i>unlikely to appear as a totally alien feature</i> '	King's Lynn and West Norfolk Borough Council
That a new overhead line ' <i>will intensify the level of development in an area that feels quite isolated and remote outside of the existing villages</i> '.	King's Lynn and West Norfolk Borough Council
Take reasonable measures to reduce visual impact on the landscape	East of England Development Agency
Potential impact a new overhead line would have on the landscape	14 members of the public
Preference for a shortest route of an overhead line	10 members of the public

Wildlife and Nature Conservation	Consultee (Statutory and Non-Statutory)
Effect of the works on River Nar SSSI and Islington Heronry SSSI	Natural England
Impact on the Ouse Washes SPA, (specifically migrating swans)	Natural England
Risk of bird collisions	Natural England, Environment Agency
Consider that the West and Central Routes would require an Appropriate Assessment	Natural England
Notification of existence of West Winch Common, River Nar SSSI, Islington Heronry SSSI, the Wash, North Norfolk Coast AONB	Environment Agency
Biodiversity impact	Norfolk County Council, King's Lynn and West Norfolk Borough Council, Environment Agency, RSPB
Consult with Norfolk Wildlife Trust so that they are able to assess the likely impacts of the project	Environment Agency
Identification of Saddlebow reed beds	Environment Agency
East Corridor avoids highest bird numbers	RSPB
Reference to Marsh Harrier being a feature of the Wash SPA	RSPB
General concern for impact on nature and wildlife	11 members of the public
Potential effects on West Winch Common	Four members of the public

Other responses	Consultee (Statutory and Non-Statutory)
Unlikely to have a significant impact on land within control of North Norfolk District Council. Wish to be kept informed if location moves significantly to the East	North Norfolk District Council
Consider implication for Cambridgeshire County is minimal. If changes are made to route corridors request that CCC is re-consulted	Cambridgeshire County Council
Not clear whether county of Lincolnshire is actually affected, if it is and, if so, in what way	Lincolnshire County Council
Construction management plan	Highways Agency
Suggested MoD may have a view as it is "possible that the MoD would make recommendations related to the lighting of towers and marking of wires."	Civil Aviation Authority

Overhead line in any corridor would have severe adverse effects	Open Spaces Society
Cost associated with erecting a new overhead line compared to undergrounding the works	10 members of the public

Responded with no objections or with no comments	
No objections raised	Ministry of Defence
No comments	Passenger Focus
No comments	Disabled Persons Transport Advisory Commission
No comments	Commission for Architecture and the Built Environment
No comments	Defence Estates
Groups who did not respond	
Breckland Council	Health and Safety Executive
East Cambridgeshire District Council	Highways Authority - Norfolk
Forest Heath District Council	Historic Buildings and Monuments Commission
South Holland District Council	Homes and Communities Agency
Suffolk County Council	Joint Nature Conservation Committee
Walpole Parish Council	Maritime and Coastguard Agency
West Winch Parish Council	Local Wildlife Trust
Wiggenhall St Germans Parish Council	National Air Traffic Services
Wiggenhall St Mary Magdalen Parish Council	National Express East Anglia
North Runcton Parish Council	National Farmers' Union
Tilney All Saints Parish Council	National Grid Gas PLC
Campaign for the Protection of Rural England	Norfolk Local Resilience Forum
Campaign for National Parks	Office of the Gas and Electricity Markets (Ofgem)
Civic Trust	The Water Services Regulation Authority (Ofwat)
Coal Authority	Passenger Transport Executives
Commission for Rural Communities	Ramblers Association

Country Landowners and Business Association	The Crown Estate Commissioners
East Midlands Trains	Sustrans
EDF Energy (now UK Power Networks)	The Broads Authority
Equality and Human Rights Commission	The Marine and Fisheries Agency
First Capital Connect	The Office of Rail Regulation
Forestry Commission	Transport for London
Friends of the Earth	Downham Market Group of IDBS
Friends of AONBs Societies	Trinity House
Greenpeace	Woodland Trust
Hard-to-reach Groups who did not respond	
Travellers site at Saddlebow	Involve Day Services
West Norfolk Deaf Association	West Norfolk Mencap
King's Lynn Area Resettlement Support (KLARS)	West Norfolk Mind

7.8 With regards the consultation undertaken with the general public. During stage one consultation National Grid sent letters and information leaflets, introducing the project, to 2,504 households within a 1.5km of the boundary of all route corridors. Three public consultation events followed in March and April giving members of the public the chance to view proposals, talk to project team representatives and feed back their views. The events were attended by 81 people. There was also an opportunity for the public to provide feedback via a dedicated National Grid King's Lynn connection project website, freepost address and telephone helpline.

7.9 A total of 53 members of the public gave feedback about which route corridor they preferred with three other residents registering comments via letter or email. The results are analysed in the table below.

West Corridor	Central Corridor	East Corridor	None
24 (45.3%)	14 (26.4%)	11 (20.8%)	4 (7.5%)

7.10 The majority of the 53 residents who responded live outside the three route corridors while 12 residents who fed back, reside in the route corridors. Out of the 24 residents who named the

West Corridor as their preferred route corridor choice half gave addresses either in the East Corridor or adjacent to the East Corridor in West Winch. Four residents who live in the East Corridor cited the East as their preferred option.

7.11 From the public response the most popular choice of preferred route corridor is the West. This preference appears to be based on the perceptions that the West Corridor is the least populated area, presents less of a health hazard due to the sparse population, is mainly agricultural land, the new overhead power line will have less visual impact on the countryside and be further away from properties.

7.12 The most commonly raised public responses and the concerns that have been expressed during stage one of the public consultation are summarised below:

- Proximity to housing
- Preference for the shortest route
- Visual impact
- Wildlife / environment
- Cost
- Land use
- Undergrounding
- Property / land value
- None
- West Winch Common
- Health
- Airstrip / helicopters

7.13 One response from a member of the public referred to the Nar Valley's natural habitat and two further responses referred to a 'wildlife area' in the East Corridor which may be the Nar Valley SSSI and the County Wildlife Site including part of West Winch Common at Puny Drain. One response raised concerns about the Nar Valley being used as a natural habitat by wildlife and another commented on West Winch Common being popular with dog walkers and families.

- 7.14 A total of 15 public responses referred to the effects of a new overhead line on the landscape. These responses often noted that the land is characterised by its flatness and openness. Three of the responses raised concerns about potential effects on the landscape where views are typically unrestricted and tall vertical structures would be prominent.
- 7.15 Responses from the public generally support an approach that seeks to reduce effects and minimise visual intrusion. The shortest length of overhead line would be a connection in the Central or East Corridors. However, more of the public favoured the West Corridor which would mean the new overhead line being routed furthest away from the highest number of properties in West Winch.
- 7.16 A total of 10 public responses mention the cost of the proposed new overhead power line. Some responses comment on the cost in relation to the shortest route which would mean fewer pylons and cause less visual impact. Others mention the cost of underground cables which would avoid 'ruining the landscape'.
- 7.17 Some responses from the public indicated that locating the new overhead line on agricultural land was more appropriate while others expressed concern about the possible effect of locating pylons on agricultural land.
- 7.18 Seven members of the public consider the connection should be by underground cables. Five specifically state this would avoid adverse effects on views and landscape.
- 7.19 The recommendations within this report have taken account of all matters that have arisen from the consultation to date, all of which are fully detailed within the Stage One Feedback Report.
- 7.20 Sections 8 -21 to this report consider the various factors that have been raised by statutory, non statutory and public consultees and which are largely noted as likely general impacts within paragraph 5 of EN-1. Sections 8-13 have been structured in the following way for ease and cohesiveness.
- Introduction to topic and background in relation to this project
 - Consideration of statutory consultee comments
 - Consideration of all other consultee comments
 - Comparison of impact on each of the route corridors

8 REGARD FOR STATUTORILY DESIGNATED AREAS

8.1 The Route Corridor Study identifies four statutorily designated sites within the study area identified for the connection. These are:

- The River Nar Site of Special Scientific Interest (SSSI) (within the East Corridor)
- Islington Heronry SSSI (closer to but outside the western boundary of the West Corridor)
- Two listed buildings at Islington Hall Farm (to the north of the Western boundary of the West Corridor)

8.2 There are no other statutorily designated areas or sites in the study area. However, The Wash SSSI lies approximately 7km north of the study area and The Ouse Washes SSSI is approximately 16km distant to the southwest.

8.3 The Wash SSSI and the Ouse Washes SSSI are of particular note. These are both designated Special Protection Areas (SPAs) under European legislation protecting sites of international ornithological importance. In addition they are internationally protected under the Ramsar treaty.

8.4 The Ouse Washes SPA is on one of the major tributary rivers of The Wash comprising an extensive area of seasonally flooding wet grassland ('washland') lying between the Old and New Bedford Rivers. The site is a mosaic of rough grassland and wet pasture, with a diverse and rich ditch fauna and flora, managed through winter flooding and summer grazing and haymaking on meadows. The washlands support both breeding and wintering water birds. In winter, the site holds nationally and internationally significant bird populations.

8.5 The potential for a project to have an impact on the integrity of the Ouse Washes SPA and The Wash SPA European designated sites must be considered. It is known that birds using The Ouse Washes and The Wash migrate, roost, feed and spend time outside of the designated sites. Effects on sites outside of the designation may cause impacts on bird populations that are qualifying features of the designations. A Habitat Regulation Assessment (HRA) may be required, by which the potential effects are appraised under The Conservation of Habitats and Species Regulations 2010.

8.6 If the likelihood of significant adverse effect on a qualifying features of the SPA cannot be ruled out, or if there is uncertainty, then the competent authority must carry out an 'Appropriate Assessment' to test the effect of the project on the integrity of the SPAs. This test forms part of

the HRA process. Appropriate Assessment explores potential effects relating to a project and is undertaken as part of the determination of the application for consent.

- 8.7 It is considered that the need for Appropriate Assessment is not in itself a reason for distinguishing between corridors. However the absence of, or a lesser risk of, adverse effects on a designated site in one corridor would distinguish that corridor.
- 8.8 National Grid's environmental consultants have reviewed available information and have undertaken studies on use of the study area by birds. In response to Natural England's comments about risks to migratory swans, National Grid's environmental consultants have undertaken surveys of the autumn 2010 swan migration (birds that are a qualifying feature of the Ouse Washes SPA)³²

SSSIs

- 8.9 SSSIs are notified because of specific biological or geological features. Conservation objectives define the desired state for each site in terms of the features for which they have been designated.
- 8.10 In relation to the SSSIs, National Grid is under a duty when exercising its functions to take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which the site is of special scientific interest.
- 8.11 The River Nar is identified as of importance as an outstanding river system of its type with a diverse flora of riverine and bankside plants. The section of the river designated within the study area shows contrasting diverse flora. This designated site is in the East Corridor. A line within the Central or West Corridors would not have any effect on this designated site.
- 8.12 Islington Heronry SSSI comprises a small isolated block of mature oaks within fenland. This site is close to the western boundary of the West Corridor and its designation states that it supports the largest colony of grey herons in Norfolk, with an average of 80 occupied nests each year. There is also other bird interest in the site.

Listed buildings

- 8.13 There are two listed buildings in the study area, at Islington Hall Farm, approximately 750m north of the western boundary of the West Corridor. It is considered that the listed buildings are

³² TEP 2010, Report Reference 1907.041

sufficiently distant from the corridors so that there no material adverse effects on the setting of the listed buildings would arise from a new overhead line.

Statutory and other consultee comments

Statutory Consultees

- 8.14 King's Lynn and West Norfolk Borough Council considers that the choice of corridor and future alignment should minimise effects on nature conservation assets such as SSSIs and anticipates that other stakeholders would raise specific issues in relation to these sites.
- 8.15 Norfolk County Council made reference in initial comments under the heading Landscape to the SSSI in the East Corridor (River Nar). The council has provided further comments which supersede those previously made. The latest comments do not make specific reference to any designated sites. However, the Council supports the comments from the Royal Society for the Protection of Birds (RSPB) that bird diverters should be used on all new power lines in this area.
- 8.16 Natural England has responded expressing concern about the proximity of the West Corridor to the Islington Heronry SSSI and potential effects on the River Nar SSSI from a route in the East Corridor. Since the time of expressing concern regarding risk to Islington Heronry SSSI, Natural England has accepted that the nesting site had been abandoned for the 2010 breeding season. Natural England has subsequently confirmed that it maintains this view but that the concern would relate specifically to the West Corridor. Natural England requests that National Grid takes account of effects on the heronry and should the West Corridor be taken forward then further detailed assessment of potential effects on the heronry would be required. It notes concern regarding risk to the River Nar SSSI but that this could be avoided if an alignment within the East Corridor was west of the river.
- 8.17 Natural England expressed concern about possible effects on features of interest of the Ouse Washes Special Protection Area (SPA). Natural England has expressed concerns regarding the potential collision of migrating whooper and Bewick's swans with a new overhead line. Natural England's concern relates to the West and Central Corridors which would cross the River Great Ouse and/or the Ouse Relief Channel.
- 8.18 Natural England notes that although the route taken by migrating swans to access the Ouse Washes is not fully known at present, waterfowl are known to follow features such as watercourses in some instances. Natural England has formed a precautionary opinion that there is a likely significant effect on the Ouse Washes SPA from the West and Central Corridors.

- 8.19 Natural England's consultation response initially advised that an Appropriate Assessment under the Habitat Regulations would be required of the final route alignment if the West or Central Corridor was selected. Natural England advised that adequate survey information would need to support an assessment on these species and the Ouse Washes SPA in the Environmental Statement prepared to support the application. National Grid's environmental advisors have undertaken surveys which are reported in a supporting document.³³ Natural England has subsequently confirmed that it is satisfied with the range of species that has been appraised in the bird surveys for 2009 and 2010. Natural England has also confirmed its agreement with National Grid's conclusion that the risk, through collision or displacement, to SPA species other than the migrating swan species (whooper and Bewick's) does not represent a likely significant effect on either The Wash or Ouse Washes SPAs.
- 8.20 National Grid provided Natural England with further information about the Autumn 2010 swan migrations. Natural England confirmed in December 2010 its general agreement that the risks to the two swan species are low, as indicated by the findings of the Ornithological Assessment Report³³ and supported by the autumn swan migration surveys. Natural England has not suggested that a HRA is required at this stage.
- 8.21 Natural England's response advised that the West Corridor should not be pursued further. This appears to be based on the potential effects on the Islington Heronry SSSI and the Ouse Washes SPA.
- 8.22 English Heritage expressed a preference for the East Corridor as this corridor would result in an overhead line furthest away from any listed buildings and thereby minimising the impact on the setting of the buildings.

Other Consultees

- 8.23 The RSPB referred to the importance of the Great Ouse 'corridor' and suggested the majority of high collision risk bird species are associated with the Central and West Corridor, with the West Corridor being least acceptable. RSPB noted that the East Corridor avoids the area of highest bird numbers and is likely to have least effect on biodiversity within area.
- 8.24 Four responses from members of the public raised specific concerns regarding potential effects of an overhead line route on Islington Heronry although none made reference to its present abandonment.

³³ TEP 2010, Report Reference 1907.041

8.25 One response from a member of the public referred to the Nar Valley's natural habitat and two further responses referred to a 'wildlife area' in the East Corridor which are the Nar Valley SSSI and the County Wildlife Site including part of West Winch Common at Puny Drain. Two responses raised concerns with respect to the uses of West Winch Common. In each case no specific issues were raised additional to those raised by statutory consultees.

Comparison of impacts of route corridors

8.26 The risk of collision and disturbance has been identified to the Islington Heronry SSSI from an alignment in the West Corridor and is a concern expressed by Natural England, reinforced by the RSPB.

8.27 Herons are birds which literature reviews indicate are vulnerable to overhead line collisions. Islington Heronry SSSI is not within any of the route corridors, although it is close to the western edge of the West Corridor. It would not be directly affected by an overhead line in any corridor. A new overhead line on the western side of the West Corridor could introduce risk during the breeding season and this risk could affect the primary interest for which the site is designated. However it is less likely that an overhead line aligned in the eastern part of the West Corridor would pose particular risk to birds using the heronry.

8.28 It is considered that the presence of the Islington Heronry SSSI is not sufficient reason to discount the West Corridor whilst there are options within the corridor for an alignment that would avoid the risk to the heronry. In its consultation responses Natural England has not stated that the West Corridor should be discounted because of risks to the heronry, although it has advised that potential effects on the site should be considered further if National Grid selects the West Corridor as its preferred option.

8.29 Site surveys have shown that the heronry has been abandoned. If the heron population no longer uses the wood, there is no potential for disturbance or other effects from an overhead line. If it is assumed that the heronry re-establishes, a line built close to the western edge of the West Corridor could give rise to adverse effects as it would pose collision risk to birds during the breeding season. A new line close to the woodland may cause effects such as 'displacement' for some breeding seasons whilst birds habituate to its presence. Natural England has indicated that a zone (which would be defined by further studies) between the heronry and an overhead line would be necessary to ensure that herons could continue to use it in the future. National Grid considers that this would relate to an overhead line built in the western part of the West Corridor. If built to the eastern side of this corridor an overhead line would be unlikely to give rise to adverse effects if the heronry was in use.

8.30 Natural England and RSPB raise particular concern about birds, qualifying features of the Ouse Washes SPA, and collision risk with a new overhead line. From studies undertaken to date

National Grid's environmental consultant's conclusion is that no species listed as an SPA qualifying feature will experience significant population impacts. Surveys to date have revealed very little swan activity in the study area. Further surveys have been undertaken in autumn 2010 and programmed for spring 2011 to observe bird migration which has and will provide information to inform the Environmental Impact Assessment for the scheme. However it is not considered that the present consultation and decision process should be delayed pending the outcome of those further surveys, as they can be taken into account as appropriate as and when they become available.

8.31 Potential impacts on heritage assets are discussed in more detail in section 10 of this report.

9 REGARD FOR LANDSCAPE CHARACTER AND VISUAL AMENITY

9.1 The Route Corridor Study describes the landscape of the study area with reference to published landscape character assessments.

9.2 The study area falls within two of the former Countryside Agency (now Natural England) countryside character areas. The majority of the study area falls within Landscape Character Area 46 - The Fens, described as a large flat area which slowly drains towards The Wash, England's largest tidal estuary. Much of the land is below sea level, relying on pumped drainage and the control of sluices at high and low tides to maintain its agricultural viability.

9.3 The landscape is predominantly characterised by a hierarchy of rivers, drains and ditches. All the rivers are bounded by high banks to contain the watercourse from the lower adjacent fields. In some locations inland silt banks (roddons) mark the former course of old river beds and now lie up to 2-3m above the dark peat soils which have subsequently shrunk due to continuous cultivation, drainage and wind erosion of the peat.

9.4 Land use is described as intensive agricultural including a wide range of arable, root crops, bulbs, vegetables and livestock. Higher ground within the Fens comprises elevated 'islands' often occupied by settlements.

9.5 A small part of the study area along its eastern boundary falls within Character Area 76 - North West Norfolk. This area comprises a large-scale arable and grassland landscape on big rolling upland terrain, with frequent long views over remnant heath and large belts of mixed woodland.

9.6 Key features characteristic of this area include extensive estates giving a unified and well-managed quality to the landscape which are enhanced by the rectilinear network of late enclosure. Settlement in this North West Norfolk character area is described as predominantly comprising large and widely spaced villages, often clustered around a green or common. Isolated outlying farms with Georgian farmhouses are also typical of the area.

- 9.7 Saved Local Plan Policy 4/6: 'Area of Important Landscape Quality' highlights the need to protect areas of locally important landscapes and a background paper identified two types of landscape areas, 'confined' and 'open'. The 'confined' area includes the eastern edge of the study area. The majority of the study area is in the 'open' area of reclaimed marshes and fens adjacent to the River Great Ouse.
- 9.8 In 2003, Land Use Consultants (LUC) produced a guidance document, titled 'Wind Turbine Development Landscape Assessment, Evaluation and Guidance', for Breckland Council and King's Lynn and West Norfolk Borough Council. This study evaluated the capacity of different types of landscape to accommodate wind turbine development.
- 9.9 The study area falls almost entirely within landscape type 5: The Fens – Open Inland Marshes, described as a large scale landscape with extensive vistas and a strong sense of openness. The land is described as strikingly flat with large scale arable farming fields divided by a regular network of drainage ditches.
- 9.10 A borough-wide Landscape Character Assessment was undertaken in 2007 to inform the Local Development Framework (Chris Blandford Associates March 2007). This assessment identified two character areas within the King's Lynn B connection study area: 'settled inland marshes' and 'open inland marshes'.
- 9.11 The area of settled inland marshes is characterised as a large scale, low lying landscape offering distant, panoramic views. The area is an intensively farmed arable landscape comprising predominantly geometric fields divided by straight drainage channels and dykes. This area is also described as well settled, with villages, town edges, large houses, individual farms and properties generally in view.
- 9.12 The largest proportion of the study area is identified as comprising open inland marshes. This area is described as very open and defined by a large scale arable landscape. Extensive fields are divided by a regular network of drainage ditches and dykes, long straight roads, large straight rivers and cut off channels. Settlement in this area is limited with only a few isolated villages and dispersed farmsteads. Throughout the open and settled inland marshes overhead lines are described as dominant features that are frequently present in views.
- 9.13 Site assessment indicates that there is some slight distinction between the route corridors where the East Corridor has greater numbers of trees, tree groups and scrub, more consistent with the 'confined' landscape type as noted in the Local Plan or 'settled' character areas as described by the borough-wide Landscape Character Assessment. This distinction is slight but is consistent with the other assessments reported which note a change in character in the eastern part of the East Corridor.

- 9.14 The more 'confined' character, which extends from Puny Drain and West Winch Common to the edge of the settlement, has slightly greater capacity to absorb an overhead line. There are opportunities for mitigation in the form of tree and hedge planting to channel and screen views which would be consistent with existing landscape characteristics.
- 9.15 The draft Overarching NPS for Energy (EN1) states in paras 5.9.8- 9 that the conservation of the natural beauty of the landscape and countryside should be given substantial weight by the IPC in deciding on applications for development consent in a designated landscape areas. This principle echoes Rule 1 of the Holford rules which states that overhead transmission lines should be planned to avoid areas of the highest amenity value, even if the total mileage is somewhat increased as a consequence.

Statutory consultee comments

Statutory Consultees

- 9.16 Natural England comments that the Central Corridor would have least impact on landscape character by virtue of potentially being shortest although the East Corridor with an alignment to the west of the River Nar would avoid effects (including those on statutorily designated sites for nature conservation, see above) and so is preferred.
- 9.17 Natural England also commented that it considered the National Cycle Route 1 (which passes through the Central Corridor along High Road and Thiefgate Lane) was a constraint which had been omitted in the Route Corridor Study. National Grid has noted this comment and has considered generally the effects on views from the cycleway and public footpaths. This is a matter which is not considered to be a significant factor in the choice of corridor, and will be considered separately at the route alignment stage. Users of the cycleway and footpaths in each of the corridors will be typically travelling distances where the view changes throughout the journey, encompassing a wide range of focal points and panoramas, including various types of built form. They would see the new connection if built within any of the route corridors and it would appear in views between the power stations and the existing overhead line.
- 9.18 Initial response from Norfolk County Council noted some concern regarding effects on the landscape in the East Corridor. It was not clear from the comments about which aspects of the landscape the Council was most concerned and further clarification was sought. Subsequently the County Council has confirmed that it has a preference for the East Corridor because it considers that there would be least impact on biodiversity. The Council reiterates the comments of the RSPB and Natural England regarding the installation of bird deflectors on all power lines in this area.

- 9.19 The County Council considers that there is insufficient difference in landscape terms between the corridors for this to be an overriding factor in corridor choice.
- 9.20 King's Lynn and West Norfolk Borough Council has indicated no overall preference in the route corridors. It considers that the landscape in each is of similar character and acknowledges that overhead lines form part of this character. The Council has indicated a preference for a choice of corridor which would minimise the number of pylons required to construct and advises that any alignment should also minimise effects on residential property.
- 9.21 The Borough Council considers that all three of the corridors comprise similar landscapes where there are general long, open views across open, low-lying countryside. It notes that the landscape is typically characterised by small villages and individual properties that are a legacy of an agricultural heritage. Views from within settlements are 'severely restricted by relatively modest planting and other structures' and that a significant number of pylons are existing characteristic features. It is the Borough Council's opinion that a proposed new overhead line in this area is unlikely to appear as a totally alien feature in the landscape. The Council indicates that as a consequence of a new overhead line the level of development in the locality would be intensified. This could affect the landscape outside of the developed areas where the Council considers there to be a feeling of remoteness.³⁴

Other Consultees

- 9.22 Effects of the presence of a new overhead line in the landscape were noted in 15 responses from members of the public. Responses often noted that the land is characterised by its flatness and openness. Three responses referred to concerns regarding potential effects on this landscape where views are typically unrestricted and tall vertical structures are prominent.
- 9.23 Responses generally support an approach that seeks to reduce effects and minimise visual intrusion. The shortest length of overhead line would be a connection in the Central or East Corridors. However the highest number of preferences from the public consultations were for the West and Central Corridors, reflecting their distance from the highest number of properties which are in West Winch.
- 9.24 Seven responses referred to a preference for an underground connection with six people stating reducing effects on views as their reason for preferring this option.

³⁴ King's Lynn and West Norfolk Borough Council, email of 27th September 2010

Comparison of route corridor impacts

- 9.25 It is noted that with regard to effects on landscape character, Natural England expresses a view that the Central Corridor is preferred (Natural England's overall preference for the East Corridor relates to a balance that includes effects on statutorily designated sites for nature conservation).
- 9.26 The Borough Council's comments indicate no general corridor preference however it refers to a sense of openness and remoteness in the wider landscape outside urban areas. The West Corridor is the furthest from significant areas of development.
- 9.27 The Route Corridor Study considered that the East Corridor presents the greatest opportunities to utilise tree and shrub cover for screening, with slightly greater capacity to accommodate the scale of a 400kV overhead line in a landscape where its visual effects would be prominent. There is potential for appropriate separation from dwellings by using undeveloped land. Alignments can be considered which seek optimum opportunities to minimise the visual effects on the surrounding environment.
- 9.28 The Route Corridor Study noted in the East Corridor that pockets of tall riverside vegetation, trees and shrubs enclose views from sections of the Nar Valley Way long distance footpath which potentially minimises visual effects.
- 9.29 The draft revised NPS for Electricity Networks Infrastructure (EN-5) stated at para 2.8.5 that the IPC should bear in mind the Holford Rules, the guidelines for routing a new overhead line, specifically when considering the landscape and visual impacts of a proposal. Whilst there is only slight variation between the landscape character within the three corridors, the variation that does exist is of relevance as indicated by Rule 4 of the Holford Rules. This states that where possible an alignment with trees and hills as a background should be selected in preference to sky backgrounds. Furthermore Rule 6 states that in flat landscapes high voltage lines should be kept as independent of smaller lines, as far as possible.
- 9.30 Hedges, small groups of trees and shrubs at West Winch Common provide enclosure to views towards and from the edge of West Winch village. Landform is generally undulating on the Common. There are notable changes in levels and embankments adjacent to Puny Drain, often with shrubs growing on the slopes which together provide a filtering effect in views. There are mature tree groups on the north west edge of West Winch village which encloses and screens views towards the corridors.
- 9.31 It is considered that there are alignments in each route corridor which are acceptable with regard to effects on amenity, considered as views from residential properties.

- 9.32 Land at the north east edge of the East Corridor is allocated in the King's Lynn and West Norfolk Local Plan as suitable for future employment land uses. The Nar Valley Way and River Nar extend north through this allocated land. If developed in the future its character would substantially alter to that of an urban area similar to existing adjacent industrial sites to the north. This employment land would influence the character of land in the East Corridor to that of urban fringe meaning that the landscape in this corridor could be less sensitive than West or Central. King's Lynn and West Norfolk Borough Council has not completed work on its Local Development Framework and is not in a position to confirm if this employment land will be taken forward.
- 9.33 Consideration has been given to the impact of bird flight diverters over the three route corridors and particularly in relation to the West and Central Corridors because routeing in these corridors will require a crossing over the River Great Ouse and its relief channel. Natural England, RSPB and National Grid's consultants have advised that there is a potential risk of birds colliding with a new overhead line crossing these watercourses.
- 9.34 The purpose of the bird diverters is to make the overhead line more visible allowing birds in flight to recognise and avoid the obstacle. Bird diverters increase the visual prominence of an overhead line in the landscape. This is contrary to the general aspiration when constructing a new overhead line to minimise visual effects and the specific representations from Norfolk County Council and King's Lynn and West Norfolk Borough Council.
- 9.35 An alignment in the East Corridor would avoid the major river crossings and hence would, in National Grid's consultant's view, remove the need for flight deflectors and the consequent secondary visual effect. It is maintained by RSPB that bird deflectors should be placed on all overhead lines. This is not a view supported by National Grid's consultant who consider the avoidance of the major river crossings negated the need for deflectors in this instance.

10 REGARD FOR CULTURAL HERITAGE

- 10.1 There are two listed buildings at Islington Hall Farm on the northern edge of the connection study area, as noted under Section 8 - Regard for Statutorily Designated Areas. These buildings are not in any of the route corridors. They are approximately 1km from the northwest edge of the West Corridor. There are no other designations related to archaeology and cultural heritage in the study area.

Statutory consultee comments

- 10.2 King's Lynn and West Norfolk District Council expects proposals to minimise impact upon heritage assets, including listed buildings which may be present in the route corridors. The

Council draws National Grid's attention to the guidance prepared by English Heritage on assessing the effect of development upon the setting of such assets.

- 10.3 English Heritage commented that the Western Corridor would lead to the greatest impact on the setting of listed buildings close to the corridor edge. It was also indicated that the East Corridor would have the least impact on any listed buildings. Therefore a clear preference was expressed for the East Corridor based solely upon the potential impact on listed buildings.
- 10.4 No consultees identified any other heritage assents other than listed buildings as stated within PPS 5.

Comparison of impacts of route corridors

- 10.5 The Route Corridor Study demonstrated that there is no material distinction between the three routes with regard to potential effects on archaeology and cultural heritage. Whilst English Heritage have expressed a preference for the East Corridor, section 8 on statutorily designated sites above addresses the few listed buildings in the study area and states that the preference identified by English Heritage is not considered to be of such significance to differentiate between corridors.
- 10.6 Records including non-statutory designated areas indicate no distinction between the route corridors with regard to archaeological potential across the connection study area.

11 REGARD FOR ECOLOGY AND BIODIVERSITY

- 11.1 The study area is predominantly in highly productive agricultural use and nature conservation interest is focused on the watercourses and areas of more natural vegetation not in agricultural use.
- 11.2 The features of greatest ecological and biodiversity potential are the woodland comprising Islington Heronry and the River Nar which is the most natural watercourse. Each of these is a statutorily protected site considered in Section 8 above.
- 11.3 The River Great Ouse and its Relief Channel have man-made banks and relatively low levels of bankside vegetation and could be avoided by route alignment. The water banks could be avoided by an overhead line crossing. Ecological interest in the water contained in each watercourse similarly would be unaffected by the connection.

Statutory consultee comments

Statutory Consultees

- 11.4 Natural England's response on ecology and biodiversity relates to the statutorily designated sites discussed in Section 8.
- 11.5 Norfolk County Council referred to the River Nar Site of Special Scientific Interest which is addressed in Section 8 above. It also referred to the County Wildlife Site in the East Corridor (Puny Drain and West Winch Common) with concern regarding construction impacts.
- 11.6 The County Council has confirmed that it has a preference for the East Corridor because it considers that there would be least impact on biodiversity.

Other Consultees

- 11.7 The RSPB notes that an overhead line brings potential collision risks to birds and suggests the majority of species at risk are associated with the West Corridor. It views the West Corridor as least acceptable. RSPB considers that the East Corridor avoids the area of highest bird numbers and is likely to have least effect on biodiversity within area. RSPB has requested the use of bird deflectors in all three of the corridors.
- 11.8 As mentioned at paragraph 8.24 four members of the public stated concern regarding Islington Heronry Site of Special Scientific Interest, which is addressed in Section 8 above.

- 11.9 Three responses from members of the public state raise concern about the effects on birds. One relates to habitats at West Winch Common and the Nar Valley. Another response refers to birds using the River Great Ouse. A further response refers to birds breeding in the fenland landscape.

Comparison of impacts of route corridors

- 11.10 West Winch Common is not in any of the route corridors. It adjoins the east boundary of the East Corridor at Puny Drain. Part of the Common and the Puny Drain are a County Wildlife Site (CWS). West Winch Common extends east to the edge of West Winch village. Habitats here are largely rough grassland used for grazing and groups of shrubs. The CWS at Puny Drain comprises a man-made steep sided ditch and adjacent grassland. There are occasional groups of trees and shrubs at the top of banks and further mounding/embankments adjacent to the ditch. The ditch is occasionally bridged/culverted to allow access to fields between Puny Drain and the railway. A new overhead line in the East Corridor would not affect habitats at West Winch Common.
- 11.11 A section of the River Nar Valley (SSSI) is in the East Corridor as described at Section 8. National Grid has a duty in relation to the conservation and enhancement of SSSIs as stated at paragraph 8.10. Temporary effects on habitats at West Winch Common and the River Nar are possible as a result of construction and access works. However this is dependent on route alignment. Detailed surveys and liaison with local authorities and Natural England would be undertaken at a later stage of the project which would ensure that effects on the designated features of the sites would be minimised.
- 11.12 National Grid has commissioned surveys for birds in each of the corridors. Surveys to date have revealed very little bird activity in the study area and those species listed as an SPA qualifying feature will not experience significant population impacts. Natural England has confirmed that it supports this view. Further surveys of migrating swans will be undertaken in the spring of 2011. National Grid's environmental consultants are satisfied that there is strong evidence to conclude that there will be no adverse impacts. The survey data and assessment is provided in a separate report and is discussed more in section 8. It is considered that it is not necessary to delay the present consultation and decision process on this account.
- 11.13 The revised draft NPS for EN- 5 states at para 2.7.1 that there may be possible implications of large terrestrial and wetland birds such as swans and geese colliding with overhead lines associated with power infrastructure. Para 2.7.4 goes on to suggest that the siting of a line away from, or parallel to, but not across, known flight paths can reduce the number of bird collisions considerably.

11.14 In developing designs for a new overhead line National Grid will seek to avoid effects on breeding birds as far as possible.

12 REGARD FOR LAND USE

12.1 The land in the connection study area through which the route corridors pass is predominantly agricultural.

12.2 The East Corridor includes the greatest areas of land not in productive agricultural use including railway land, River Nar SSSI and an informal motorbike track.

12.3 There are residential properties within each route corridor. Effects on amenity arising from the presence of a new overhead line are considered under Section 9.

Statutory consultee comments

Statutory Consultees

12.4 Norfolk County Council provided information on waste sites, noting that a small portion of the East Corridor passes within the safeguarding consultation buffer of both proposed and existing waste sites. It notes that it has no objection in principle to the connection corridors provided that the construction and operation of the new line does not prejudice safe operation of its waste sites.

12.5 The Environment Agency referred to the need to secure necessary consents for crossing water courses it manages and for overhead line pylons and any other equipment to avoid encroaching within the byelaw distance from the top of the bank of managed watercourses. These are standard requirements with which National Grid is familiar from its operation and development of the national high voltage transmission system.

12.6 The Environment Agency also advised they may wish to construct a form of renewable energy generator on land which they own in the Central Corridor. The Environment Agency are at the inception stage with no certainty of the project, and its location, being progressed and consented. As such National Grid has not considered this to be a differentiating factor in selecting a preferred route corridor.

12.7 The Civil Aviation Authority responded that it did not anticipate issues related to civil aerodrome effects on aircraft from overhead line pylons approximately 50m high.

Other Consultees

- 12.8 One response from a member of the public referred to the possibility of effects on light aircraft using an airstrip running north-south on the southern boundary of the West Corridor. Another response questioned whether there would be any effect on the air ambulance using Queen Elizabeth Hospital.
- 12.9 Responses from other members of the public included reference to agricultural land being most appropriate for the new line and other responses expressed concern regarding possible effect on productive land use.

Comparison of impacts of route corridors

- 12.10 Overhead line construction causes temporary disturbance to land and can temporarily restrict access to other areas depending on working areas required. The footprints of overhead line pylons affect agricultural operations by introducing an obstacle to machinery. Operations such as water jet irrigation or use of very high vehicles and attachments are restricted beneath conductors to ensure that safety clearances are maintained. These restrictions apply equally across all corridors and landowners are compensated for temporary disturbance and for the presence of the overhead line on their land.
- 12.11 A longer route would have greater effects on land use than a shorter route, although this can vary with numbers and types of pylons used. Field pattern can also influence how pylon positions can be accommodated to minimise constraints.

13 ENGINEERING

- 13.1 This section considers factors within each route corridor that may have an impact on corridor preference.

Comparison of impacts of Route Corridors

- 13.2 All three corridors are characterised by flat, low lying arable land which is supported by a network of drains.
- 13.3 An overhead line in the West Corridor would need to traverse both the River Great Ouse and a large relief channel. A route in the Central Corridor would need to cross the large relief channel only. Due to increased overhead line safety clearance requirements across the river and relief channel, pylon heights would be increased in the West and Central Corridors, otherwise the pylon height would be comparable with the existing 400kV line.

- 13.4 Towards the centre of the East Corridor are the River Nar, Nar Valley Way and electrified railway which all run north to south. Dependent on route alignment in this corridor, it may be necessary to cross the obstacles above. However, an overhead line in this corridor would avoid crossing any substantial obstacles such as the relief channel or River Great Ouse.
- 13.5 Subject to route alignment, it is estimated that between nine and 11 pylons would be required for a connection route from the existing 400kV overhead line to the proposed substation through the West Corridor. The route could consist of one terminal pylon, one turn in pylon and possibly two or three tension pylons. The remaining pylons would be suspension pylons.
- 13.6 Subject to route alignment, it is estimated that between seven and nine pylons will be required for a connection route from the existing 400kV overhead line to the proposed substation through the Central Corridor. The route would consist of one terminal pylon, one turn in pylon and possibly one or two tension pylons. The remaining pylons will be suspension pylons.
- 13.7 Subject to route alignment, it is estimated that between eight and ten pylons will be required for a connection route from the existing 400kV overhead line to the proposed substation through the East Corridor. The route would consist of one terminal pylon, one turn in pylon and possibly one or two tension pylons. The remaining pylons will be suspension pylons.
- 13.8 The two high pressure gas pipelines will influence how the power lines enter the proposed substation at King's Lynn B power station for all three corridors.
- 13.9 Although subject to a full soil investigation survey, short term construction phase access accommodation works are likely to be extensive in all three corridors, with piled foundations likely for all pylon positions due to the nature of the area and the local surface geology (Terrington Beds, silty clay and sandy silts), an issue highlighted by the Borough Council in their consultation response.
- 13.10 It is considered that access for the construction and ongoing maintenance of the proposed connection could physically be achieved within all three identified corridors.
- 13.11 The West Corridor is divided into three access areas formed by the River Great Ouse and a Relief Channel. The Central Corridor is divided into two access areas by the Relief Channel. The East Corridor is divided into three access areas formed by the River Nar and the Railway both running north to south.
- 13.12 Roads in the Central Corridor are confined to the southern portion of the corridor which means that construction traffic for the Central Corridor would potentially have to pass through Saddle Bow.

- 13.13 The minor roads in the west are less suitable. The humped-back bridge crossing over the A47 at Tilney High End may not be suitable for some heavy plant (such as low loaders), which may limit construction traffic routes to the West Corridor. The raised road at Eau Brink may also not be suitable. Routing and all construction traffic would be subject to survey in all three corridors.
- 13.14 Provided access is to the west of the River Nar, roads in the East Corridor are more extensive than the West or Central corridors and run north to south. This could potentially allow for shorter accesses than either the West or Central Corridors. However, if access is required to the east of the River Nar, traffic movements may be through the village of West Winch across West Winch Common, with requirements to cross the electrified railway and the River Nar.
- 13.15 A more detailed estimate of traffic volumes and their impacts on local roads will be possible once routing options / scope of works / surveys / traffic management plans have been assessed.

Statutory consultee comments

- 13.16 King's Lynn and West Norfolk Borough Council raised concern regarding effects on residential property during the construction phase of development. It requests that in any future construction work National Grid employs techniques that minimise impact of the works on residents. It further advises that attention needs to be paid to foundation design and any piling that may be needed as a result of the ground conditions in the Fens. The Council's concerns relate primarily to disturbance from construction work and design issues which would be addressed at a later stage and relate to each corridor equally.

Ancillary Works/Third Parties

- 13.17 This section considers the effects of each route corridor on existing utilities and access arrangements.
- 13.18 A search of Third Party apparatus has revealed that two High Pressure gas pipelines cross all three corridors running in an east to west direction. These will need to be fully taken into account during the design and construction of the overhead line.
- 13.19 Early negotiations will need to be commenced with the Inland Drainage Boards to ensure all their requirements are taken into account when planning the works. In addition the Environment Agency and Natural England will also need to be consulted for any works near river banks and working over water.
- 13.20 As previously stated National Grid is aware that EDF Energy recently sold their distribution network business and is now to be known as UK Power Networks. A UK Power Networks 33kV

power line supported by wooden poles crosses the West Corridor along with two UK Power Networks 33kV power lines supported by wooden poles which enter King's Lynn power station. UK Power Networks 11kV power line supported by wooden poles crosses the East Corridor. These may need relocating to avoid the need to cross them; this will be subject to route alignment.

Comparison of impacts of Route Corridors

- 13.21 Access works in the East Corridor have the potential to be at least 20% less than either the Central or West Corridors (subject to route alignment) as this area is better supported by roads. This would reduce the amount of materials required, vehicle movements and have less of an impact on the local residents. There is also the potential in the East Corridor of utilising or reinforcing an existing bridge that crosses the River Nar to the north of the Corridor. If either of those options were not viable then, dependent on route alignment, a temporary bridge may be required over the River Nar or access required across West Winch Common.
- 13.22 The West Corridor is the least supported in terms of existing roads and therefore has the potential for the greatest amount of temporary construction works. The West Corridor crosses the high pressure gas pipelines at a more oblique angle which may increase the number of angle pylons.

14 INALIENABLE AND COMMON LAND

- 14.1 The National Trust manages inalienable land on behalf of the nation. Land declared inalienable by the National Trust is afforded special protection by Parliament, implemented by virtue of section 18 of the Acquisition of Land Act 1981. It can act as a significant constraint on development by third parties. There is no such land within any of the route corridors.
- 14.2 In our investigations and enquiries regarding land ownership and interests in the three route corridors themselves, the only matter to note is West Winch Common to the east of the East Corridor. If it is proposed to acquire rights over this land, it would be necessary to seek approval under the special parliamentary procedure or a certificate from the Secretary of State, subject to satisfying various requirements.
- 14.3 If access is required across this land to the East Corridor these procedures may be invoked depending on route alignment. Neither the West nor Central Corridors are affected by a need to access common land.

15 AVIATION

- 15.1 The draft revised Overarching NPS for Energy (EN-1) notes that *“UK airspace is important for both civilian and military aviation interests. It is essential that the safety of the UK aerodromes, aircraft and airspace is not adversely affected by new energy infrastructure”*.
- 15.2 A resident mentioned the presence of an airstrip approximately 1km due south of the existing Norwich to Walpole overhead line. There do not appear to be any other airstrips or airfields within the study area.
- 15.3 Due to the distance of the airfield from the existing overhead line and the fact that the airstrip is aligned north-south, the same general direction as any potential overhead line would be within any of the three corridors. It is concluded that the presence of the airstrip cannot be used to differentiate between the route corridors.

16 CUMULATIVE IMPACTS

- 16.1 Cumulative impacts may arise when, for example, one development is to be progressed in close proximity to another, and which could combine to produce a significant impact.
- 16.2 Following consultation and investigations, It is understood that there are no other major developments planned in the study area during the construction period for the overhead line. It is acknowledged there is the potential for revised employment and housing allocations to be proposed by the Borough Council within its LDF documentation. However the first step to an allocation, the consultation on the proposal documentation, is not expected until March 2011 at the earliest. It has also been acknowledged earlier in this report that the Environment Agency may wish to construct a form of energy generation on land which it owns within the West/Central Corridor. The Environment Agency is at the inception stage with no certainty of the project and its location being progressed and consented. As such National Grid does not consider this to be significant in considering cumulative effects. This is also the case with a proposed waste site to the north of the power station site. Whilst the proposed site is just north of the power station site, no cumulative effects of any relevance are expected. Should any construction works coincide with the proposed National Grid works these will be taken into consideration as appropriate.

17 FLOOD RISK/CLIMATE CHANGE RESILIENCE

- 17.1 The draft revised NPS on electricity networks requires promoters to consider the potential impact of climate change on electricity networks infrastructure. In particular, consideration needs to be given to how the proposal would be resilient to;

- Flooding, particularly for substations that are vital for the electricity transmission and distribution network;
- Effects of wind and storms on overhead lines;
- Higher average temperatures leading to increased transmission losses; and
- Earth movement or subsidence caused by flooding and drought for underground cables.

17.2 National Grid is not currently proposing to change its design standards for overhead lines to take account of climate change. This is based on recommendations made following a collaborative project led by the Meteorological Office. Current projections around the impact of climate change in the UK forecast extremes of wet and dry (heavy rain and drought) and more occurrences of high wind. Overhead line design for climatic loads is driven by wind, ice and wind-on-ice loadings. However the models used to simulate changes are not highly capable to create similar scenarios and therefore in the absence of robust evidence the project recommended that the industry continue to use design criteria based on present day risk. The same criteria will apply to all three corridors.

17.3 It is envisaged that the required substation will be provided at King's Lynn B power station pursuant to the existing section 36 consent and hence would not change regardless of the corridor selected. While all of the route corridors are within an area of flood risk it is relatively straightforward to build flood resilience into overhead lines by addressing safety clearances from anticipated flood levels in line design. The presence of overhead line pylons in areas of flood risk has negligible effect on the displacement of flood water as the lattice steel construction poses no material changes to water flow.

17.4 Given the above, there is no basis for selecting the preferred route corridor on the basis of flood risk.

18 SOCIO ECONOMIC

18.1 As part of the full back checking process detail earlier in this report, a socio-economic and planning policy review for the strategic options was undertaken by Roger Tym & Partners covering the following areas:

- Planning policy constraints and opportunities
- The significance of the tourism sector

- Quality of agricultural land
- Deprivation issues.

18.2 The conclusions that are reached from this review highlight that there is little, or no, difference between the strategic options that are detailed within the optioneering report. Therefore it can be further concluded that if there is little differentiation between options that are strategically and geographically much greater there will be no discernable differences between three relatively compact route corridors. It is also concluded that there would be no effect on proposed allocation of employment land to the east of the East Corridor and therefore it is recommended that no preference could be expressed on socio-economic grounds.

19 LAND VALUE

19.1 There are similar numbers of land parcels and residential properties within each corridor. The effect of any proposed overhead line on land and property values would be largely as a result of the visual and other amenity impacts which are considered in section 9 and will be assessed in an EIA. It is considered there are alignments in each corridor which would be acceptable in terms of views from and the amenity of residential properties, see paragraph 9.31

20 HEALTH

20.1 It is National Grid's position that all their power lines comply with two related sets of policies. Firstly, they comply with the Health Protection Agency's recommendations on international guidelines for limiting exposure to Electro Magnetic Fields (EMFs), which are adopted by the UK Government. Secondly, following a major stakeholder exercise called SAGE – Stakeholder Advisory Group on ELF (extremely low frequency) EMFs – the UK has a policy of taking precautionary measures to reduce EMFs where these are of low cost. When applied to overhead lines this means it is appropriate to route them away from homes where possible, and to include a design feature called 'optimal phasing' which reduces the EMFs, but not to require a minimum separation between overhead lines and homes. It is not therefore considered appropriate to use such criteria to differentiate between route corridors as all corridors offer potential alignments that operate within the recognised standards. Therefore there would not be any differentiation established between the corridors on these grounds.

21 COST

21.1 Based on the level of information that is available at this stage of the project, the relative cost of all three route corridor options would be between approximately £40 – 45m. Until such time as the project has been designed in detail and the involvement of contractors, suppliers and landowners sought, it is not possible to provide more detailed project costs.

21.2 However, even at this stage of the project it is possible to establish that the costs associated with constructing an overhead line in any of the three corridors would be broadly similar and therefore any preference on corridor selection will be largely based on other more distinguishing factors.

22 Review of Strategic Optioneering

22.1 As discussed in section 2 of this report a detailed process of reviewing and back-checking the various strategic connection options that had been considered at the prior the first stage of consultation was undertaken by the project team. In addition to a review of the existing connection options, as a result of the consultation feedback, a review of the possible underground cable options was also undertaken. The review process included a socio-economic, environmental, technical and whole life cost review of the strategic options detailed within the published Strategic Optioneering Report. In addition to this consideration was given to the possible underground connection options and the subsequent implications of such connections.

22.2 In summary the results of this review concluded that in terms of socio economic impact the various underground options will have lower visual impacts than an overhead line solution and therefore less impact on tourism and growth areas. However these options will have much greater land requirements and therefore perform less well than overhead options in terms of potential impacts on agricultural land.

22.3 With regard to the life time costs review Option KL2 still remains the cheapest option an estimated life time cost of £45.1m (updated capital cost £40m).

22.4 Underground options KL2b and KL3a were also considered. KL2b includes 2.5km of underground cable between King's Lynn B power station and the existing Walpole – Norwich Main 1 400kV circuit. Whilst there may be some visual amenity benefits to this option the estimated capital cost would be £93.7m (lifetime cost £95m). The minimal visual benefit is not considered to outweigh the significant additional cost required.

22.5 Option KL3a considers using underground cables for the section of the connection proposed to run between King's Lynn B power station and a proposed substation close to the existing Walpole – Norwich Main 1 400kV circuit. In landscape terms a new GIS substation would create a concentration in views of overhead lines and towers leading to equipment on the ground and into a GIS building. Furthermore this option would require a substation to be located within an area at high risk of flooding. It is considered that there would be no justifiable reason to seek the relocation of the substation located within the King's Lynn B power station site, that already benefits from deemed planning permission via a Section 36 consent granted by the Secretary of State and is outside an area at high risk from flooding.

22.6 As a consequence of our the review process it is concluded that Option KL2, an overhead line connecting Kings Lynn B power station to the nearby Walpole – Norwich circuit, is the option which best meets National Grid’s technical, economic and environmental obligations. The option is compliant with the technical standards required, is the lowest cost option available and avoids the need for flood zone development of a new 400kV substation whilst performing comparatively from an environmental perspective with the alternatives. Hence the original optioneering selection has been confirmed as valid.

23 CONCLUSIONS AND RECOMMENDATIONS

- 23.1 National Grid is bound by its statutory obligations “*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission*” These statutory obligations are there to protect the consumer and the actions of National Grid are monitored by the regulator (Ofgem) to ensure that the duties are met. This report has concluded that all of the route corridors are capable of providing an efficient transmission connection which can be effectively co-ordinated with the generator and other programmed works within the region. Furthermore all of the route corridors could accommodate a project which would be system compliant and deliverable. Therefore in terms of efficiency and co-ordination there is no basis to determine a preference between the three route corridors.
- 23.2 Whilst the longest corridor is the West Corridor and therefore likely to be the most costly at approximately £45m. The Central and East Corridors would offer a maximum potential saving of around 9%. As discussed at section 21, until such time as the project has been designed in more detail with the engagement of contractors, suppliers and landowners, it is not possible to provide more detailed project costs. Subsequently, and on balance, it is considered that the likely costs associated with each corridor are broadly similar and the economics of the project should not be a significant factor in establishing a preferred route corridor. In light of these findings the further statutory duties, and any subsequent differences found between the three route corridors arising from these duties, placed upon National Grid by Section 38 and Schedule 9 are of particular pertinence.
- 23.3 With regard to consultation the Feedback Report for Stage One provides in depth analysis of the feedback received from consultation with the general public. The results show that of the 53 respondents who expressed a preference, 45.3% indicated a preference for the West Corridor, 26.4% for the Central Corridor, 20.8% for the East Corridor, and 7.5% gave no preference to any of the three proposed route corridors.
- 23.4 The issue raised most frequently by the general public concerned the proximity of a new overhead line to existing residential properties. National Grid has reviewed the three corridors and the opportunities that each offers to maximise distances to dwellings. It is considered that the Central Corridor provides the least scope to separate a new overhead line from dwellings with the greatest flexibility to maximise distances in the East Corridor.
- 23.5 The East Corridor provides potential alignments that would use the least amount of angle pylons, thereby reducing the visual impact. Furthermore, it offers the best opportunity for natural, albeit limited, screening as advocated by Rule 4 of the Holford Rules. The East potentially offers the greatest opportunity to minimise the visual impact of a new overhead line. Therefore there would be a preference for the East Corridor based on the potential effects on views.

- 23.6 The West and Central Corridors have the largest field sizes and greatest areas of agricultural land. Although landscape character is similar across all three corridors the East Corridor has slightly more varied land use, field sizes, tree and hedgerow cover.
- 23.7 There is little distinction between the route corridors in terms of land use. However the East Corridor offers more flexibility regarding pylon positions in relation to productive farm land.
- 23.8 There is no distinction between the route corridors with regard to potential effects on archaeology and cultural heritage.
- 23.9 There is no distinction between the three corridors with regards to cumulative impact, airstrips, flood risk, socio-economic, land value or health issues.
- 23.10 The existing road network in the East Corridor offers the greatest flexibility to minimise the amount of construction works, such as temporary stone roads.
- 23.11 It is considered that adverse effects on designated sites, the River Nar SSSI and Islington Heronry SSSI, can be avoided by siting pylons away from the river banks and the western edge of the West Corridor closest to the heronry. Natural England notes that effects could be avoided if an alignment to the West of the River Nar, within the Eastern Corridor, is followed.
- 23.12 There is no material distinction between the corridors based on other issues of ecology and biodiversity with the exception of birds which follows.
- 23.13 Natural England has advised there is a potential risk to birds from an overhead line in the West or Central Corridors. The birds which could be at risk are 'qualifying features' of the Ouse Washes Special Protection Area, specifically migratory swans. Following the submission of further information to Natural England it has agreed that the risk to these species is low in each route corridor but further states that it is not in a position to conclude at present that there is no likely significant impact on the Ouse Washes SPA. However Natural England acknowledges that further survey work is proposed in spring 2011 and the findings will address this matter.
- 23.14 National Grid's environmental consultants have reviewed available information, undertaken research of bird use in the area and consulted further with Natural England. The studies indicate that risks to birds which are qualifying features of the Ouse SPA are low and that these risks are lower in the East Corridor. This opinion is supported by Natural England. A preference for this corridor would present the least potential impacts to the SPA species: whooper swan, Bewick's swan, mute swan, wigeon, teal, mallard, pochard, shoveler, goldeneye and lapwing as well as the non-SPA species cormorant.

23.15 It has been noted, having regard to biodiversity and the ornithological interest of European designated sites there have been comments received from statutory and non statutory consultees relating to this subject all support a preference for the East Corridor.

23.16 Bird flight diverters are likely to be a requirement at major river crossings (both the River Great Ouse and the Ouse Relief Channel) to minimise bird collisions in the Central or West Corridor. It is considered that such diverters would not be warranted in the East Corridor. The purpose of bird flight diverters is to make the overhead line more visible. This increases the prominence of the line in the landscape. This is contrary to the general aspiration to limit visual impact of a new overhead line.

Recommendation

23.17 It is considered that there is no reason that the decision on route corridor preference should be delayed pending the planned review of bird migration routes or for the other ongoing reviews referred to in para 11.12 above. The back-checking process and review of underground options that have been undertaken form an appropriate basis for making a sound decision for a preferred corridor to develop an overhead line connection (sections 2 and 22).

23.18 The East Corridor offers the greatest flexibility to route an overhead line away from dwellings, whilst minimising visual impact by potentially utilising the least amount of angle pylons, taking advantage of the albeit limited natural screening (section 9). It would have greatest capacity to cater for construction works and future maintenance of an overhead line. This would avoid the need for construction traffic to travel through Saddle Bow in the Central Corridor and to construct extensive temporary roads required for the West Corridor (section 13). The East Corridor negates the need to cross either one or both of the major waterways therefore minimising impacts on the bird population (section 11).

23.19 Whilst an overhead line in the East Corridor could be marginally longer than one in the Central Corridor, (which could potentially be the shortest) and hence may not be the most economic option (section 22), it is considered to be the preferred corridor, taking account of all competing factors and statutory obligations.

23.20 The East Corridor is, therefore recommended as the basis for developing a route alignment to comply with its obligation to provide a connection between Centrica's proposed 981MW King's Lynn B power station and the existing 400kV National Grid overhead line.

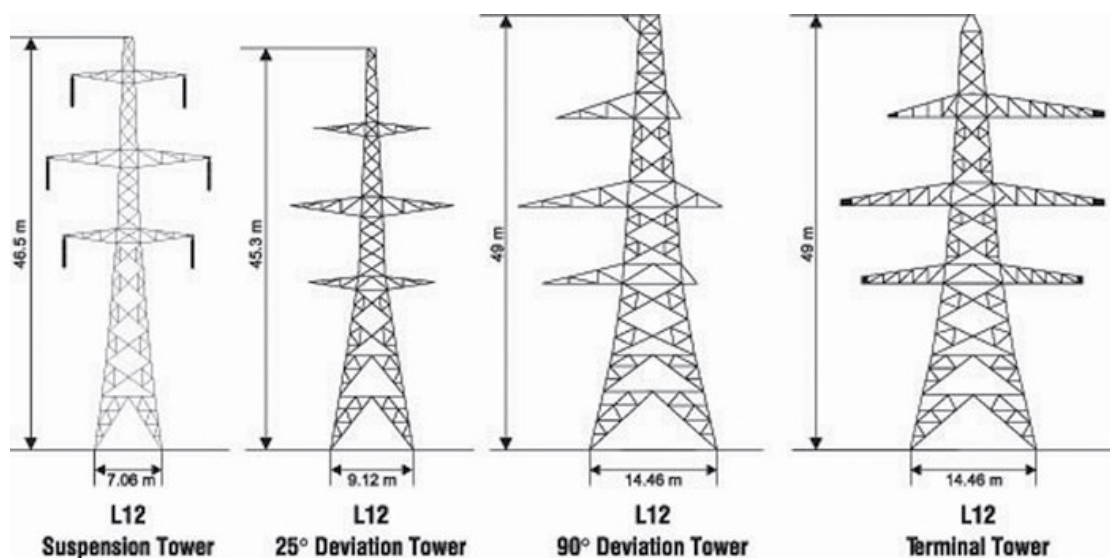
24 NEXT STEPS

- 24.1 Following National Grid executive approval of the preferred route corridor, Stage 2 of the project will commence. Detailed consideration will be given to possible alignments for overhead lines, and pylon locations, within the preferred corridor. The detailed alignments will be subject to environmental survey work and further public consultation. The Consultation Strategy for Stage 2 will include the establishment of Community Workshops to inform the development of a preferred alignment option alongside the environmental survey work. The refinement of a proposed alignment will emerge as part of this consultation process.
- 24.2 National Grid's public consultation on the preferred alignment option will be undertaken in spring 2011. A proposal will then established followed by further consultation on the proposed works in the summer of 2011. Following this round of consultation a proposal will be finalised and a submission made to the IPC (or its successor) in autumn/winter 2011, seeking consent for the connection and associated development.
- 24.3 Timescales and activities may be subject to alteration as the project progresses.

APPENDIX A: PYLON (TOWER) TYPES

A typical National Grid overhead line route will involve the use of three main types of pylons, also known as towers. They are as follows:

- Suspension towers – these support the conductor (wire) on straight stretches of line. Conductors are suspended by a string of insulators.
- Angle or Deviation towers – these are of greater bulk than suspension towers these occur at points where the route changes direction. Conductors are attached by horizontal strings of insulators
- Terminal towers – these towers are of greater bulk in order to ensure stability. They occur at the end of overhead lines where they connect with substations or underground cables.



Typical example of a Suspension Tower




Typical example of an Angle or Deviation Tower

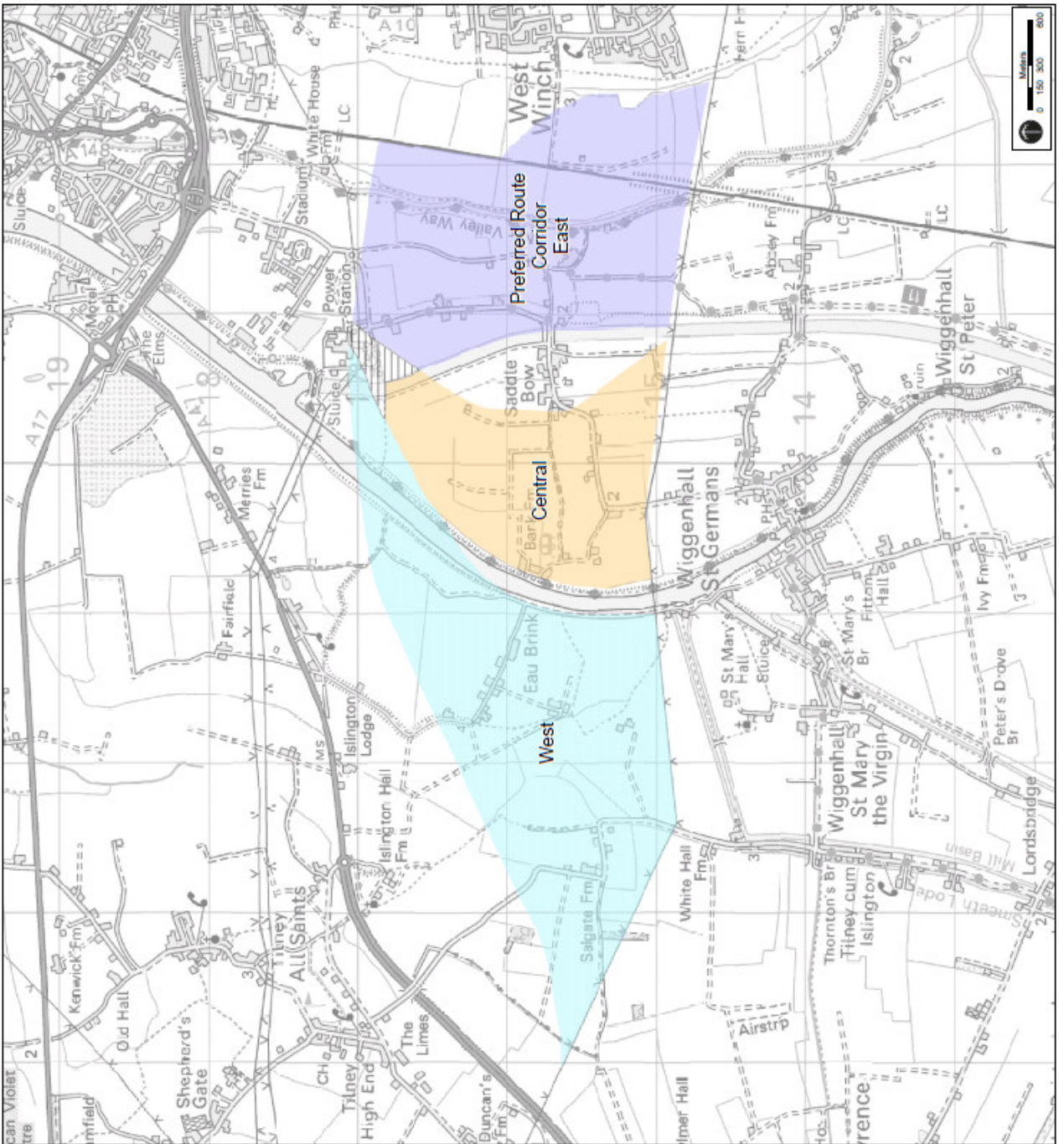


Typical example of a Terminal Tower

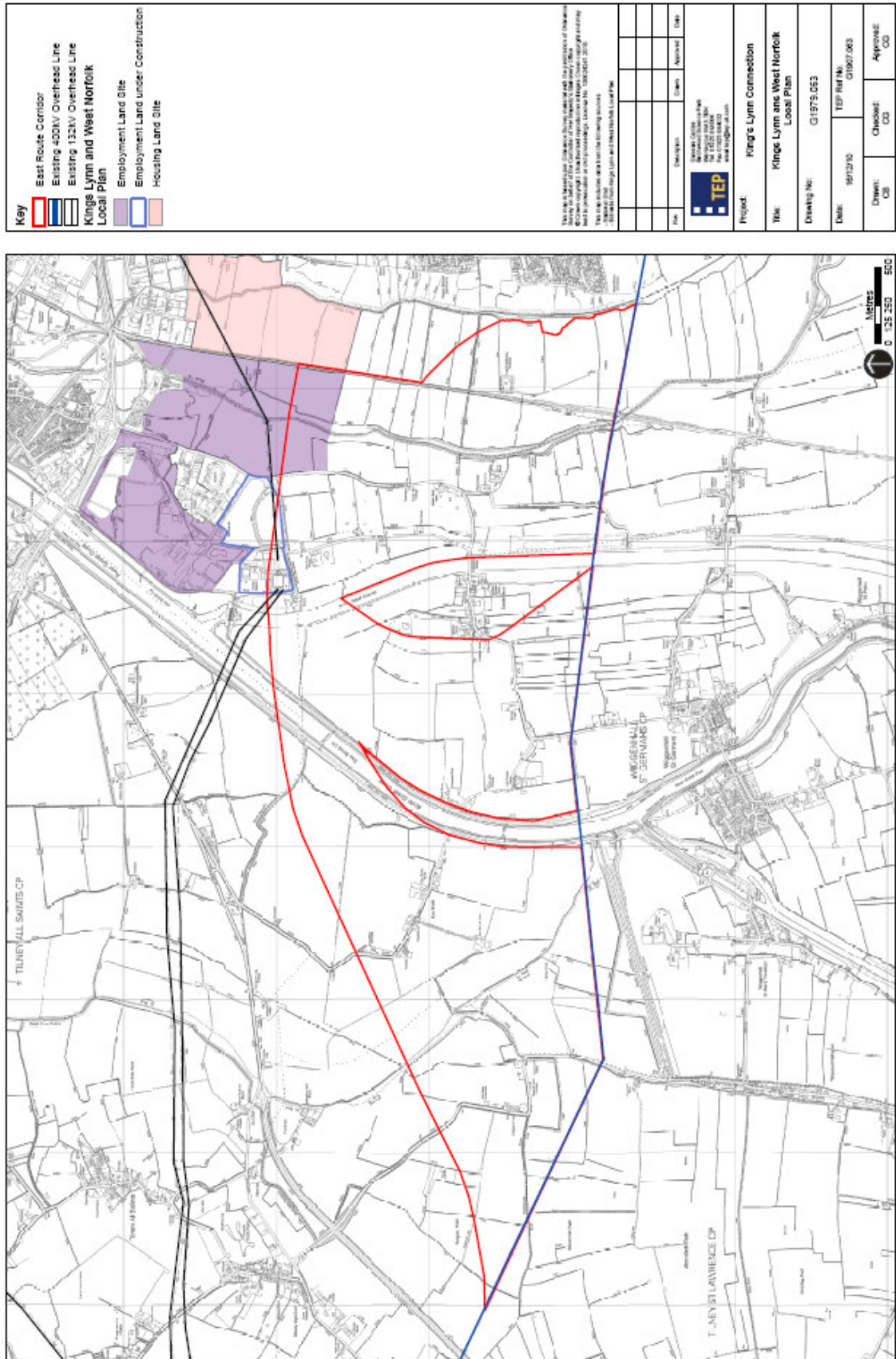


APPENDIX B: MAP OF THE THREE ROUTE CORRIDORS

Key Route Corridor Options West Route Central Route East Route - Preferred Route Corridor Overlapping Corridors	This map is based upon Ordnance Survey data which is the property of Ordnance Survey and is used here under license from the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction (in any form) is prohibited. Ordnance Survey is not liable for any loss or damage arising from use of this map.	
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Project: King's Lynn Connection Title: Route Corridor Options (with Preferred Corridor) Drawing No: 01907.058 Date: 29-11-10 TEP Ref No: G1907.058 Drawn: CB Checked: CG Approved: CG		

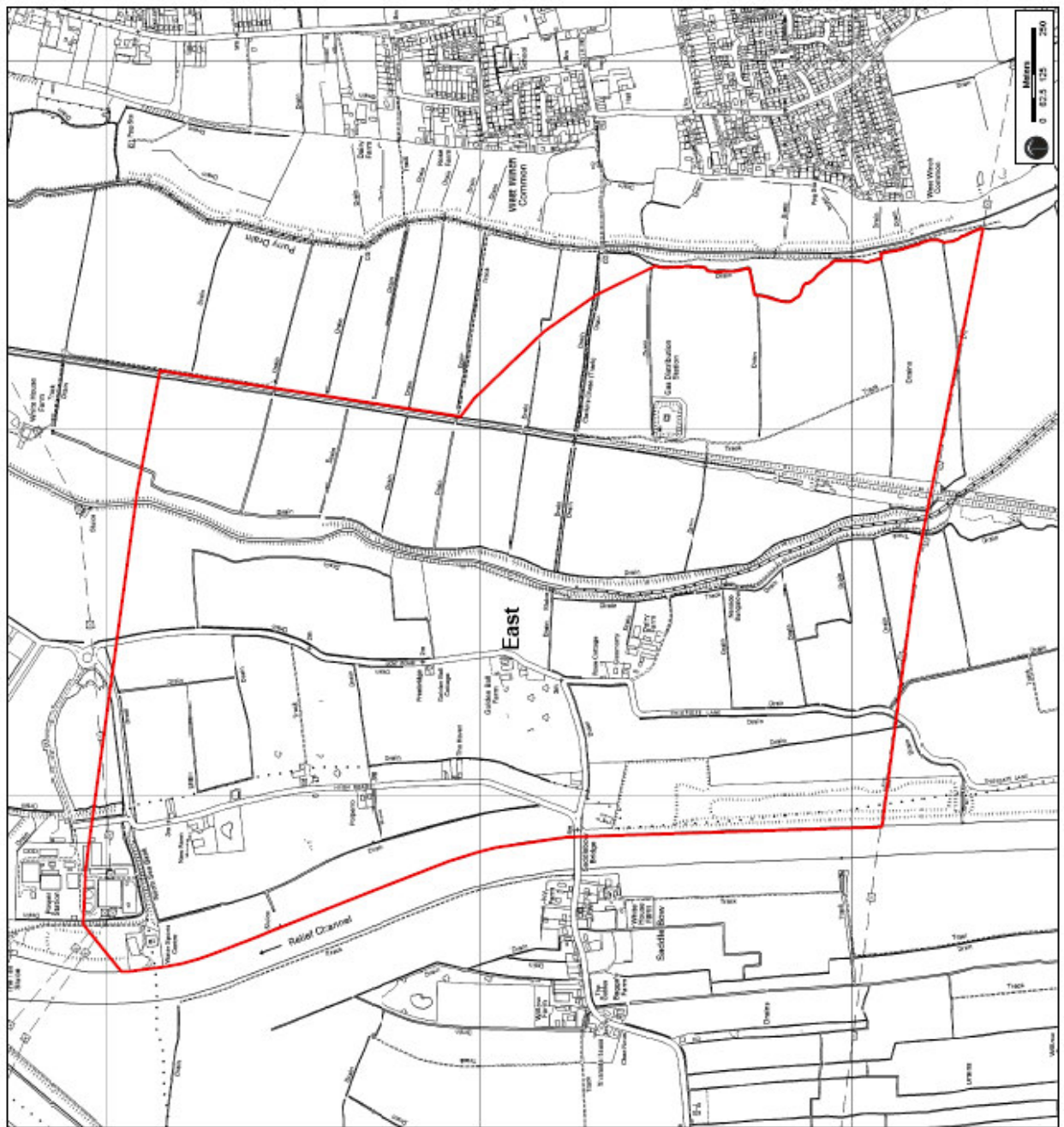


APPENDIX C: DETAILS OF ALLOCATIONS WITHIN LOCAL PLAN



APPENDIX D: MAP OF THE PREFERRED ROUTE CORRIDOR

Key  Preferred Route Corridor	<small>This map is based upon Ordnance Survey data with the permission of Ordnance Survey. It is not to be used for navigation. The copyright in this map is owned by the Controller of Her Majesty's Stationery Office. Crown copyright. Unauthorised reproduction may be liable to prosecution under the Copyright, Designs and Patents Act 1988.</small>	
	 TEP Technical Engineering Practice 20, 21 & 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.	
Project: King's Lynn Connection Title: Preferred Route Corridor Drawing No: 01907/055a Date: 06-11-10 TEP Ref No: 01907/055a Drawn: CB Checked: CO Approved: CO		



APPENDIX E: ABBREVIATIONS

AONB	Area of Outstanding Natural Beauty
DNO	Distribution Network Operator
EDF	Electricité de France
HVDC	High-voltage Direct Current
GIS	Gas Insulated Switchgear
km	Kilometre
kV	Kilovolt
m	Metre
MVA	Megavolt Ampere
MW	Megawatt
NETSQSS	National Electricity Transmission System Security and Quality of Supply Standard
NNR	National Nature Reserve
SAC	Special Area of Conservation
SGT	Super Grid Transformer
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest