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E.ON Climate and Renewables (EC&R)

Kelmarsh Wind Farm

Design and Access Statement

February 2010

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<td>25/01/10</td>
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1. Introduction

1.1 Introduction

1.1.1 In accordance with Section 42 of the Planning and Compulsory Purchase Act 2004 and the Department of Communities and Local Government (DCLG) Circular 01/06 there is a requirement for many types of planning applications to be accompanied by a Design and Access Statement.

1.1.2 The purpose of a Design and Access Statement is to allow the applicant to demonstrate that development proposals are based on a thoughtful design process and a sustainable approach to access. The Design and Access Statement should also demonstrate how the development proposal has evolved during the design process.

1.1.3 This Design and Access Statement has been produced in accordance with the DCLG Circular 01/2006 ‘Guidance on Changes to the Development Control System’, and with reference to the Commission for Architecture and the Built Environment publication ‘Design and Access Statements - how to write, read and use them’ (2006).

1.1.4 It accompanies a planning application submitted on behalf of E.ON Climate and Renewables (EC&R) by Entec UK Ltd for the proposed Kelmarsh Wind Farm. The planning application is accompanied by three other key documents:

1) Environmental Statement (ES).
2) Planning Statement (PS).
3) Statement of Community Involvement (SCI).

1.2 Methodology

1.2.1 The process involved in formulating the design of the proposed Kelmarsh Wind Farm has been led by a combination of engineering requirements, environmental constraints and stakeholder consultation, in order to produce an appropriate layout in terms of function and energy yield whilst seeking to avoid or reduce environmental effects (in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 and Planning Policy Statement 22 - Renewable Energy).

1.2.2 The Environmental Impact Assessment (EIA) process also exploits opportunities for positive design, rather than merely seeking to avoid adverse environmental effects. A number of design iterations (in effect, in-built mitigation) have taken place in response to environmental issues identified during the EIA process and comments received during consultation with statutory and non-statutory consultees and the local community. The Design and Access Statement is seen as having an important role in contributing to the design process through the clear documentation of design evolution.
Wind farms are a sustainable form of development, based on the production of clean, renewable energy. As such, the potential environmental effects are usually associated with the construction period and the reversible effects of wind turbines on landscape and visual amenity.

The proposed Kelmarsh Wind Farm has therefore been developed with environmental considerations at the forefront of both site selection and site design. A detailed understanding of the existing environment (including land use, ecology and ornithology, noise, landscape and visual effects, archaeology, and flood risk) obtained through technical studies and public consultation also contributed to the design process. This has ensured a holistic design approach to the proposed Kelmarsh Wind Farm.

1.3 The Proposal

1.3.1 The proposals consist of:

“A wind energy development comprising of the erection, 25 year operation and subsequent decommissioning of seven wind turbines, together with a new vehicular access off Rectory Lane (the minor road between Kelmarsh and Haselbech Grange), on-site-access tracks, hard standing areas, control building and cabling, and a permanent anemometer mast, on land to the south of the A14, approximately 1.4km south west of Kelmarsh Village at National Grid Reference E472191 N278584.”

1.3.2 The proposed location of the wind farm is shown at Figure 1.2, ES Volume 2 and the layout of the proposed Kelmarsh Wind Farm at Figure 3.1, ES Volume 2.

1.3.3 EC&R has undertaken detailed work to establish the viability of the development site for a wind energy development comprising seven turbines with the potential to generate between 2.0MW and 2.5MW of electricity per turbine (depending on the actual choice of wind turbine).

1.4 About the Applicant

1.4.1 E.ON is one of the world’s largest investor-owned power and gas companies employing around 9,000 people worldwide. E.ON Climate and Renewables UK Developments Ltd (EC&R) is a global business responsible for the E.ON Group’s global renewable energy generation and climate protection activities.

1.4.2 EC&R are already one of the largest renewable energy companies in the world, with ambitious investment plans to grow key renewable energy technologies in existing and new markets worldwide. EC&R has an objective to be a leading player in the highly competitive and rapidly growing renewables sector through organic growth, acquisitions and systematic research and development. They are investing €8 billion

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1 Five with a maximum overall tip height of up to 126.5m and two with a maximum overall tip height of up to 121m
in renewable energy generation and climate protection projects from 2007 to 2011 and will play a leading role in the development of the renewables industry worldwide.

1.4.3 EC&R is already active worldwide in onshore and offshore wind, solar, biomass and biogas technologies and aims to increase its renewable energy generation capacity from 2.9GW today to around 10GW by 2015.

1.4.4 In the UK, EC&R is one of the leading renewable energy generators with a portfolio of 20 operational onshore and offshore wind farms and one of the largest dedicated biomass power stations in the UK, the award winning 44MW generation capacity Steven’s Croft power station, near Lockerbie, Scotland. They are in the final stages of commissioning their third offshore wind farm, the 180MW Robin Rigg wind farm project in the Solway Firth, and are in a consortium developing the London Array, which, once built, will be the world’s largest offshore wind farm. EC&R have been awarded rights by The Crown Estate to develop a large offshore wind farm off the Sussex coastline, under the Round 3 programme. They are also taking the lead in developing a range of innovative renewable technologies, including bringing marine energy to market.

1.4.5 EC&R have been operating in renewables since 1991 and so have a wealth of knowledge and experience in developing renewable projects. Once a project has a positive planning determination, EC&R will manage the construction and operation of the wind farm project and will also be responsible for decommissioning the wind farm at the end of its planning permission term. The EC&R asset operations team ensures that a high availability of wind farms is achieved and also ensures the wind turbines are being well maintained. They have a strong team of engineers looking after their wind farm sites and a dedicated control room at their UK headquarters in Coventry.

1.4.6 E.ON is one of the only UK wind farm developers currently certified to the internationally recognised environmental management standard, ISO 14001, and, as such, places a great emphasis on the proper management of environmental risk during construction of its wind farms.

1.5 Structure

1.5.1 The Design and Access Statement is set out in the following way:

- Chapter 2 provides a description of the site selection process;
- Chapter 3 outlines the main influences that have guided the wind farm design process, including planning policy guidelines and consultation with a wide range of statutory consultees, other interested parties and local residents;
- Chapter 4 presents the evolutionary process of designing the proposed wind farm turbine layout and associated infrastructure and explains how the design guidelines outlined in Chapter 3 have been applied to the development site. This chapter summarises factors that were considered in the development of the design;
• Chapter 5 provides a summary description of the proposed Kelmarsh Wind Farm; and
• Chapter 6 considers the issues associated with transportation and access.
2. Development Context

2.1 Introduction

2.1.1 The proposed Kelmarsh Wind Farm site is centred on National Grid Reference (NGR) E 472191 N 278584 and located off Rectory Lane, Kelmarsh in Northamptonshire. It is situated immediately adjacent to the southern boundary of the A14(T), approximately 1.4km southwest of the village of Kelmarsh and approximately 7km south of Market Harborough.

2.1.2 The proposed Kelmarsh Wind Farm will be designed with an operational life of 25 years at the end of which it will be decommissioned.

2.1.3 The proposed location of the wind farm is shown at Figure 1.2, ES Volume 2 and the layout of the proposed Kelmarsh Wind Farm at Figure 3.1, ES Volume 2.

2.1.4 Wind farms are normally connected to either the distribution or transmission electricity networks\(^2\). Which network is used is generally determined by the capacity of the wind farm. In the case of the proposed Kelmarsh Wind Farm the connection will be to the distribution network, the means by which it is to be connected is yet to be confirmed. Network studies and discussions with E.ON Central Networks indicate that the most likely connection will be a 33 kV local connection to the Farndon Road sub-station in Market Harborough, with the cables running underground. The connection between the wind farm and distribution network is subject to a separate consent procedure and is therefore not considered further within this ES.

2.1.5 The total capacity of the proposed Kelmarsh Wind Farm will be between 14 MW and 17.5 MW based on the use of turbines with individual rated outputs of between 2.0 MW and 2.5 MW.

2.1.6 The total capacity of the proposed Kelmarsh Wind Farm based on seven Siemens SWT-2.3 (2.3MW) machines (the reference turbine) will be 16.1 MW. The net capacity factor has been calculated as 33\%. As this is subject to confirmation, following the completion of wind monitoring on-site, electricity production over a range of capacity factors has been given.

2.1.7 Taking into account that the turbines will not operate at full capacity all of the time, the amount of electricity produced by the proposed wind farm (using the reference turbine) has been estimated to be in the order of 35,259 MWhr per year to 49,363 MWhr per year.

\(^2\) The local network is generally referred to as the distribution network and the national network as the transmission network
2.2 Planning Designations Affecting the Development Site

Flood Risk
2.2.1 The River Ise intersects the development site. As a result a small area adjacent to the river is deemed to be Flood Zone 3 by the Environment Agency. All turbines are located in areas designated as Flood Zone 1, and therefore an area of with a low flood risk.

Agricultural Land Classification
2.2.2 The Agricultural Land Classification designates the site as Grade 3, the predominant classification within Northamptonshire and the East Midlands, with Grade 3 subdivided into sub grades 3a and 3b. It has not been possible to distinguish whether the parts of the development site classified as Grade 3 falls within 3a or 3b as there is no detailed survey data available.

Wildlife and Nature Conservation
2.2.3 The development site itself is not covered by any statutory wildlife designation.

2.2.4 Tallyho Covert Local Wildlife Site (LWS) lies within the development site boundary, the nearest proposed wind turbine is approximately 300m to the east and it is separated by a byway from the construction area. Given that Tallyho Covert is designated due to its woodland habitat, no direct or indirect impacts are envisaged. Two Potential Local Wildlife Sites are proposed adjacent to Tallyho Covert. The reasons for these designations are unknown but it is assumed that that the designations will be linked to Tallyho Covert (i.e. designated due to their botanical interest) and therefore no direct or indirect impacts are envisaged.

2.3 Relevant Planning History
2.3.1 Daventry District Council records indicate that there has been one recent planning application on the development site as detailed below:

- DA/2008/0886 - The erection of a single anemometry mast, no more than 60m in height and will be a temporary structure for a maximum of 24 months. The mast is required by the applicant to gather data on wind speeds in the locality as a means of determining the suitability of the site for a wind farm.

2.4 Planning Policy Context
2.4.1 The following national planning guidance and advice has been taken into account in designing the proposed Kelmarsh Wind Farm.
National Guidance

2.4.2 The Government has published over the years a series of advice notes entitled Planning Policy Guidance Notes (PPGs) and, more recently, Planning Policy Statements (PPSs) which set out the approach the Government expects to be taken on a wide range of planning issues. A number of these will be relevant to the proposed Kelmarsh Wind Farm. PPSs and PPGs identify key priorities for the planning system. They may, so far as relevant, be material considerations to be taken into account in development plan preparation and development control. Planning Policy Statements considered included:

- PPS1 - Delivering Sustainable Development;
- PPS22 - Renewable Energy;
- PPG8 - Telecommunications;
- PPS9 - Biodiversity and Geological Conservation;
- PPG15 - Planning and the Historic Environment;
- PPG16 - Archaeology and Planning;
- PPS23 - Planning and Pollution Control; and
- PPS25 - Development and Flood Risk.

Regional Planning Guidance

2.4.3 The East Midlands Regional Plan is the Regional Spatial Strategy (RSS) and was adopted in March 2009. The plan covers the period up to 2026 and provides a framework for determining planning applications as well as for preparing Local Development Documents and Local Transport Plans. The key themes relevant to the development, as referred to in the RSS, are:

- Carbon Dioxide and Renewable Energy; and
- Natural and Cultural Environment.

Daventry District Council Local Plan

2.4.4 The development site is located within Daventry district, 1.4km to the south west of Kelmarsh, Northamptonshire. The Daventry Local Plan was adopted in June 1997 and is now in the process of being updated via the Local Development Framework. However, under the provisions of the Planning and Compulsory Purchase Act 2004 certain policies within the plan remain ‘saved’.

2.4.5 The key relevant ‘saved’ Local Plan Policies are:

- Policy GN1: General;
- Policy GN2: General;
- Policy GN3: Implementing Development; and
• Policy EN1: Special Landscape Areas.

Energy and Development Supplementary Planning Document

2.4.6 Prepared by Daventry District Council and South Northamptonshire Council, this Supplementary Planning Document (SPD) provides advice and guidance on energy. Whilst the SPD if primarily focused on micro generation and energy efficiency a number of planning considerations are included, such as:

• Development should be compatible with the local geology/soil.
• Development shall enhance and respect the character and setting of historic, cultural and archaeological assets.
• Development shall respect landscape character.
• Planning conditions will normally be set in relation to planning applications requiring the removal of energy installations e.g. once their life has come to an end.

Emerging Development Plan Documents

2.4.7 West Northamptonshire Joint Planning Unit is currently producing a joint Local Development Framework (LDF) for Daventry District Council, Northampton Borough Council and South Northamptonshire Council. The LDF is made up of various Development Plan Documents (DPDs) which are at various states of production and consultation. It was anticipated that the pre-submission document would be published in November 2009 (although it has yet to be published). Adoption is anticipated to be in January 2011. Work on the other relevant DPDs that will make up the LDF has yet to commence.

2.5 Site Selection

2.5.1 The careful selection of potential wind farm sites is a critical aspect of the overall wind farm development process.

2.5.2 The EIA process started in June 2007 when EC&R as part of a UK wide search carried out a high level assessment of Northamptonshire looking to identify suitable sites for wind development opportunities.

2.5.3 The site finding exercise allowed early identification of key technical, environmental and planning issues associated with each site which could either rule it out, or point towards further detailed studies and consultation which need to be undertaken as part of further phases of work in order to establish whether or not a project is feasible.

2.5.4 The potential sites were evaluated independently of each other, based on the criteria established for evaluation of potential new wind farm sites with the intention that any site that meets the basic criteria would progress to the next stage of evaluation. The criteria based study carried out is in accordance with national planning policy on renewable energy (PPS22), the key criteria used to assess potential wind farm sites being set out below:
• **Predicted Wind Resource** - the available wind resource is a key factor when considering the commercial viability of a potential site. The available wind resource has a direct effect on the electricity produced and the pollution savings resulting from the project.

• **Electrical Connection** - most wind farms will be connected into the local electricity distribution network at an intermediate voltage of 33kV, 66kV or 132kV. The connection voltage and the distance from the wind farm to the existing network can have a significant impact on the economic viability of a wind farm proposal.

• **Access** - modern wind turbines are large structures and some components, notably the rotor blades, can only be transported to site as complete structures. The construction of a wind farm will therefore require suitable access for long load vehicles.

• **Military and Aviation Constraints** - wind turbines may affect aviation in two key ways - physical obstruction of flight-paths around airfields, and interference with radar. Physical obstruction generally affects a relatively small area around airfields and is easily defined. Effects on radar may occur over much larger areas. Consultations with the Ministry of Defence (MoD), Civil Aviation Authority (CAA) and other aviation interest groups are therefore undertaken at an early stage in site selection.

• **Planning Considerations** - The development plan policies are taken into consideration when assessing potential wind farm sites, together with national guidance contained in planning policy guidance notes and statements, particularly PPS22.

• **Separation from Dwellings** - wind turbines are large structures. For both visual and noise considerations, a reasonable distance between a wind turbine and the nearest dwelling is required in order to ensure that the amenity of local residents is protected.

• **Landscape Constraints** - national policy guidance set out in PPS22 anticipates wind development taking place in open countryside. PPS22 does not rule out the development of wind farms within locally or nationally designated landscapes.

• **Nature Conservation Constraints** - in many cases, the presence of ecological interests of acknowledged importance is indicated by nature conservation designation. Development proposals outside designated areas may still give rise to the potential for ecological issues and EC&R therefore takes advice from specialist consultants early in the development process.

2.5.5 The assessment of the proposed Kelmarsh Wind Farm site identified:

• Land Use and Context: the existing land use and environmental or planning designations on or near the proposed wind farm site;

• Wind Resource: the wind resource on site;

• Electricity Grid: proximity to the electricity grid and its likely capacity;
• Transport Infrastructure: proximity to public road infrastructure for construction, operation and maintenance;
• Residential Amenity: proximity to dwellings and settlements;
• Landscape and Visual Capacity: potential landscape and visual effects of a wind farm; and
• Commercial Viability.

2.5.6 In this site finding search, the Kelmarsh site, along with others, was identified as a potential location for a wind farm development. Other sites were rejected due to a range of factors including ornithological sensitivities, landscape and visual sensitivities and commercial constraints.

2.5.7 In parallel to this EC&R were approached by the Kelmarsh Trust to tender for an area of the estate land for a wind farm development. An initial assessment of the feasibility of the development site was conducted looking at high level constraints and key criteria for wind farm development. The outcome highlighted that:
• The development site itself and its immediate surroundings had no statutory planning or environmental designations;
• There were no Local or Structure Plan policies which in principle precluded wind farm development;
• The development site was of reasonable distance away from the nearest residential dwellings;
• There was likely to be an appropriate wind resource;
• The surrounding landscape context, the character of the landscape in which the site is located (the Northamptonshire Uplands National Character Area and the Naseby Clay Plateau local landscape character area) is of a medium to large scale and, as such, has the capacity to accept a development of this size. It is a heavily cultivated and productive landscape whose perceptual qualities have already been altered by the presence of the adjacent A14 (T);
• There were potential connection options on the E.ON Central Networks electrical grid system; and
• Subject to the need for year-round bird studies to validate desk based assessments, there was no indication of likely significant bird concerns on site.

2.5.8 It was therefore decided that the development site showed potential for a wind farm and warranted further detailed environmental and technical assessment.

2.5.9 Once awarded the site by the Kelmarsh Trust, EC&R built on the initial feasibility assessment findings and consultations, to design an appropriate, responsibly designed wind farm site which is sensitive to the surrounding area.

2.5.10 The conclusion of this preliminary work was that the proposed Kelmarsh Wind Farm site was suitable for a responsible wind farm development. As a result, the project moved to the scoping phase and a scoping request was issued to Daventry District
Council in September 2008 and their response was received in November 2008. This phase was subsequently followed by the EIA, which ultimately led to the production of the ES as the assessments indicated that potential environmental impacts were acceptable.

2.5.11 EC&R continues to develop other proposed wind farm sites throughout the UK and across Europe and North America.
3. Design Influences

3.1 Introduction

3.1.1 Once a site has been selected, the design of the wind farm is optimised in order to produce a design which maximises the use of the land available for wind power generation, balancing this against the overall environmental, social and economic effects of the proposed development. Optimising the layout of a wind farm depends on a range of technical, economic, planning and environmental criteria.

3.2 Design Guidance

3.2.1 The Design and Access Statement has been prepared with reference to a number of ‘best practice’ documents such as “Visual Representation of Wind Farms - Good Practice Guidance, 29 March 2006”.

3.3 Design Consultation

3.3.1 EC&R has undertaken a programme of consultation prior to the submission of this planning application. This began in early 2008 with an initial meeting with Daventry District Council and a public exhibition at Naseby Village Hall on the 20th February 2008 to introduce the initial project concept.

3.3.2 Daventry District Council’s Statement of Community Involvement (SCI) has informed the nature of pre-application consultation undertaken for the proposed Kelmarsh Wind Farm. Pre-application discussions took place with Daventry District Council during summer 2009 prior to the submission of the planning application. Table 3.1 outlines the programme of pre-application consultation with the local community, further details of consultation activities are provided in the Statement of Community Involvement which accompanies the planning application.
Table 3.1 Programme of Key Consultation Activities

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<td>• Landowner</td>
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<td>• Tenant farmers</td>
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<tr>
<td>February 2008</td>
<td>Website established at <a href="http://www.eon-uk.com/kelmarsh">www.eon-uk.com/kelmarsh</a></td>
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<tr>
<td>20th February 2008</td>
<td>Public exhibition Naseby Village Hall</td>
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<tr>
<td>9th and 10th August 2008</td>
<td>Stall at Kelmarsh Family Festival within the Green Zone</td>
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<tr>
<td>4th May 2009</td>
<td>Public Exhibition Naseby Village Hall</td>
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<td>5th May 2009</td>
<td>Public Exhibition Clipston Village Hall</td>
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Organisations Consulted

3.3.3 As identified above, Daventry District Council was consulted at an early stage. They were informed of the initial ideas for the proposed Kelmarsh Wind Farm and the results of the initial consultations and technical studies undertaken. Following on from this a meeting took place prior to the submission of the scoping document.

3.3.4 As part of the design process, consultation has already taken place with a number of stakeholders. Stakeholders have included Daventry District Council, local Parish Councils, Naseby Battlefield Project, the Battlefields Trust, the Civil Aviation Authority, Defence Estates, English Heritage, the Environment Agency, the Highways Agency, NATS, Natural England, Northants Bat Group, Northamptonshire County Council - Public Rights of Way, Northamptonshire County Council - Highways Department, Northamptonshire Wildlife Trust, the Royal Society for the Protection of Birds, Stop Kelmarsh Wind Farm Group (SKWF) and local residents of nearby villages including Haselbech and Kelmarsh.

3.3.5 The comments from the stakeholders have been reviewed and where appropriate have influenced the design of the scheme.

3.3.6 More detailed information relating to stakeholder and community engagement is provided within the Statement of Community Involvement (SCI) with accompanies the planning application.
4. Design Evaluation

4.1 Introduction
4.1.1 As an important stage in the evaluation process an issues and constraints exercise was undertaken whereby the planning, technical and environmental issues which could constrain or impact on the proposed Kelmarsh Wind Farm were identified and evaluated.

4.2 Wind Farm Design Process
4.2.1 The constraints identified during the project have informed the use, amount, layout, scale, and appearance of the wind farm. Following the provision of an indicative turbine layout at the start of the EIA process which was primarily based on: energy optimisation (taking into account the manner in which wind passes across the development site); turbine separation; and proximity to residential properties/roads/footpaths, the turbine layout and overall wind farm design have evolved in response to a number of factors. These broadly comprise of environmental and technical constraints, landscape design considerations, planning policy considerations and the results of feedback from consultees.

Relevant Planning Policies
4.2.2 The planning policies identified in the Planning Statement have been taken into consideration in the site selection process and also subsequently, where relevant, in the design of the wind farm. This, together with landscape guidance coupled with professional judgement, guided the consideration of turbine number and layout design.

Public Consultations
4.2.3 It was identified through consultations with the public that issues such as climate change, renewable energy generation, landscape and visual impact, recreation and public Rights of Way (including opportunities for enhancement), impact on the A14, noise, scale and health impacts warranted consideration. These issues were considered throughout the design of the wind farm. The main issues raised by local residents during public consultation are summarised in the supporting Statement of Community Involvement.

Landscape and Visual Impact
4.2.4 The landscape and visual assessment of the EIA is one of the key issues which influenced the design of the wind farm proposals. The effects of a wind farm in the landscape, and the visual effects it can create, are normally a key concern of local residents for all wind farm developments, and comments received during the public consultation exercises, and feedback from letters, telephone calls and through the
website confirmed this situation at Kelmarsh. The landscape and visual assessment is therefore described in more detail than the other subjects discussed in this section.

4.2.5 Prior to the landscape and visual assessment for the EIA several design iterations were assessed and scored against a number of landscape and visual criteria and the design with the least impact was then selected.

4.2.6 The turbine layout evolved so that the turbines would not be located on the more elevated western parts of the development site. By proposing locations that are between 34m and 50m lower than the most elevated part of the development site (its northwest corner) the turbines would be visible over a smaller area. In comparison to the initial layout the proposed layout has reduced the areas from where the turbines hubs and towers could potentially be visible by approximately ten per cent. The layout iterations have resulted in a proposed turbine layout in which most receptors’ views would be regular and well spaced, minimising adverse design effects such as turbine ‘ghosting’, the clustering of turbines and the presence of isolated, outlying turbines.

4.2.7 The subsequent landscape and visual assessment covered the following elements:

- A landscape assessment covering potential changes to landscape elements and patterns, any effects upon national and local landscape and changes to landscape character; and

- A visual assessment covering changes in the character of available views and changes in the residential amenity of a wide range of potential visual receptors.

4.2.8 The principal landscape design objectives of the proposed Kelmarsh wind farm were as follows:

- Develop an acceptable wind farm design for this site, with the wind farm and associated infrastructure designed to respond to the local landscape character and provide an acceptable design solution in terms of turbine and access track layouts and visual composition; and

- The aim of the design process is to achieve a simple, balanced, rational, and coherent image that may be viewed as an acceptable or positive component in the wide range of views available to receptors, in particular those who live, work, undertake recreational activities or travel through the detailed study area (i.e. within 10 km of any proposed turbine).

4.2.9 The methodology for the Landscape and Visual Impact Assessment (LVIA) conforms to the broad methodological approach set out in “The Guidelines for Landscape and Visual Impact Assessment, Second Edition (Landscape Institute and IEMA, 2002)”. A full description of the LVIA methodology is provided in the ES accompanying the planning application.

4.2.10 The landscape assessment concludes that the operation of the proposed wind farm would have significant effects upon the closest parts of two landscape character areas (LCA). If the definition of these LCAs was to be reviewed the presence of the turbines would be likely to cause a new LCA to be defined centred upon the Development Site and its immediate surrounding area. Otherwise, there would be no significant landscape effects upon any other LCAs, local landscape designations, or
nearby historic parks. The wind farm could be accommodated within the scale and character of the existing landscape and the landscape has the capacity to accommodate the proposed turbines and the associated ground level elements.

4.2.11 The visual assessment considers the changes in their views that would be sustained by 153 different individual or groups of people, termed visual receptors. These are mainly located within 10km of any of the proposed turbines and include all the settlements in this area and every isolated residential property and public footpath within 2.5km. The visual assessment was informed and supported by photomontages and wireframes from 27 viewpoints. Similarly, a computer software programme and digital models of the study area’s topography and the turbines was used to calculate the areas from where the turbines (both their blades and hubs) would potentially be visible.

4.2.12 The assessment concludes that significant visual effects could potentially be sustained by some of the people who live or undertake outdoor recreation at distances of up to ~2.5km of any of the turbines. The main factors that determined whether or not people in relatively close proximity would have significant effects were local topography, especially if they would be located at a considerably lower height than the development site, and the availability of nearby screening elements, in particular woodlands.

4.2.13 Given the scale and location of the wind farm, there are only a limited number of realistic mitigation measures which could be introduced, however, where available opportunities to reduce potential effects in the design and layout of the wind farm have been utilised. These include:

- control building to be constructed in a vernacular style using local materials to reflect the local rural buildings;
- the connection to the existing electricity distribution network will most likely be by an underground cable which will run alongside the road network to Farndon road substation; and
- ensure that any new gates and fencing is designed in a sympathetic style using appropriate materials as opposed to choosing styles and materials which are redolent of urban fringe locations.

4.2.14 During the de-commissioning period it is likely that similar mitigation measures will be employed as during the construction period with regard to the careful location of the construction compound and laydown areas.

4.2.15 In regards to cumulative landscape and visual effects. As of January 2010 there were twenty-six wind farms or individual turbines existing, consented or proposed for the cumulative study area which has a radius of 60km around the development site. Most of these existing or proposed wind farms are considerably more than 15km away and any potential cumulative landscape and visual effects with these can be discounted due to their separation distance. The proposed wind farms close to the M1 ~15km to the west would rarely be visible from the same locations as the proposed Kelmarsh Wind Farm. Where views could be available they would be in different directions.
4.2.16 However, there would be a greater chance of cumulative effects with regard to the proposed Harrington Wind Farm which would be located within 5km to the east with the same number and size of turbines. The main cumulative landscape effect would be that the potential revised landscape character area could extend eastwards. The two wind farms would often be seen in the same views but would be sufficiently far apart to minimise the impression of being one large wind farm. No visual receptors would sustain significant visual effects as a result of having views of both wind farms who would not already sustain significant visual effects from having close distance views of either Kelmarsh or Harrington Wind Farms.

4.2.17 In overall landscape and visual terms, the proposed introduction of turbines of this scale will inevitably lead to some significant visual effects for some people living and undertaking outdoor activities in the immediate surrounding area. However, the careful design of the turbine layout utilising the development site’s characteristics, the relatively low number of nearby properties and public footpaths and the screening provided by tree cover around some settlements and individual properties has reduced the numbers of people likely to sustain significant visual effects to a minimum.

**Noise**

4.2.18 The approach adopted for the noise assessment is summarised by the following:

- Construction noise assessment based upon predictions of plant noise from a number of operations at relevant receptors;
- Predictions of the change in traffic noise levels for roads; and
- Operational noise assessment of predicted turbine noise against measured background noise levels across a range of wind speeds.

4.2.19 The noise assessment is part of the iterative design process, with each design been assessed and amended so that the noise emissions meets limits derived following the approach given in ETSU-R-97 *The Assessment and Rating of Noise from Windfarms* at the noise monitoring points chosen. The noise monitoring points were agreed in consultation with Daventry District Council and additional points were monitored at the request of Haselbech Parish Council. There is no evidence to suggest that low frequency noise or vibration, either ground borne or airborne, due to the operation of wind farms are potential problems. The studies that have been undertaken have shown very low measured levels, substantially below levels likely to have any effect on humans or structures. These levels are typically lower than existing ambient noise and vibration levels at properties without the turbines operating.

4.2.20 Consequently, the final design of the scheme is one where the necessary operational noise limits are met and no mitigation measures are necessary. Full details can be found in the Environmental Statement accompanying the application.

**Hydrology and Hydrogeology**

4.2.21 The assessment involved the collection and interpretation of a range of information from published material, plus consultations relating to the local and wider hydrological environment with statutory bodies, principally the Environment Agency.
(EA). A site walkover was also undertaken to gain further understanding of the site’s hydrology and its potential constraints on turbine and track location.

4.2.22 The key recommendations from the hydrology and hydrogeology assessment which influenced the site design were the implementation a 50m buffer zone applied to prevent development in the immediate vicinity of the River Ise and the avoidance of Flood Zone 1. Furthermore, a 20m buffer is applied to the springs, ditches and ponds on site, and the implementation of pollution prevention controls during construction.

4.2.23 A separate Private Water Supply Risk Assessment was also undertaken and has reviewed four properties on private supplies within a 2km search radius from the development site boundary. The risk assessment identified that supply pipework for one supply crosses the development site and will potentially be impacted by on-site access track construction and the construction of Turbine 6. However, mitigation has been identified that does not require any alterations to the design.

4.2.24 Diversion of shallow agricultural pipes may also be required around wind farm infrastructure, with advice to be provided by Northamptonshire Land Drainage to allow the current level of drainage to be maintained.

Ecology and Ornithology

4.2.25 For ecology, the initial assessment consisted of desk top studies to identify the potential ecological issues at the site, followed by surveys to obtain more detailed information on various species and habitats which had potential to be found on the site. The results of the assessment work established the status of species and habitats of ecological value within the development site, and these findings were accounted for in the design of the wind farm. Specifically, the assessment influenced the design so that:

• Infrastructure would not affect any water bodies, in particular those ponds with known records of, or the potential to support, great crested newts;

• The risk of adverse effects on watercourses was reduced through incorporation of a 20m buffer zone around all watercourses within which no construction activities, except for watercourse crossings, taking place within these buffers;

• The turbines were not in close proximity to linear features such as mature hedgerows and woodland edge which tend to be used preferentially for foraging by bats (in comparison to the open fields within which turbines would be sited);

• Existing access tracks and gateways were utilised wherever possible to ensure the least level of impact on habitats present at the site and reduce the requirement for construction activities;

• Proposed turbines have been located at least 40m from any badger setts on site; and

• There are a large number of hedgerows crossing the development site which are potentially used as bat flight lines. Bats are a European protected species thus it was necessary to provide a stand-off distance of at least 50m from blade tip to any hedgerows on the development site.
4.2.26 For ornithology, a similar approach was followed, with a desk top study carried out to identify likely issues, followed by more detailed surveys covering breeding birds and wintering birds. The following environmental measures which could be included in the design to reduce the potential for adverse impacts have been identified:

- All electricity cables on site to be located underground to remove the risk of bird collision with overhead wires;

- Clearance of vegetation outside of the bird breeding season or where this is not possible, vegetation that needs to be cleared should be checked by a suitably qualified ornithologist prior to clearance to avoid the destruction of nests; and

- Enhancement measures to be provided (nesting boxes and hedgerow planting).

4.2.27 Full details can be found in the Environmental Statement.

**Cultural Heritage**

4.2.28 The consideration and assessment of potential effects on the setting of designated cultural heritage features in the vicinity of the scheme have been an important part of the design process and the iteration of scheme design has been undertaken with key cultural heritage features in mind. Consequently, turbines have been kept away from the ridge at the north of the site and from the western part of the site, reducing the visual effect on important receptors such as Naseby Battlefield and Naseby Church.

4.2.29 Although turbines have been drawn towards the eastern part of the site, the design of the layout and placement of turbines has reduced the potential effect on Kelmarsh Hall and park, given local topography, screening and design elements of the park.

4.2.30 Direct effects on identified archaeological features have been avoided where possible through scheme design, although given engineering and other, statutory, environmental constraints some effect on the archaeological resource is unavoidable. Some effects will occur on the setting of designated features including scheduled monuments and listed buildings in the vicinity of the site. However, the relatively restricted setting of most of these features and the lack of designed or intended views and vistas towards the wind farm reduces the level of potential effects to a low magnitude which will not give rise to significant effects.

**Infrastructure, Telecommunications, Utilities and Aviation Safeguarding**

4.2.31 Some telecommunications and infrastructure consultees indicated that they operate telecommunications links or plant which would potentially be affected by the proposed development. However, as far as possible, the design of the proposed wind farm has taken into account these issues and technical mitigation is available which EC&R will be required to undertake by way of a planning condition.

**Public Roads, Public Rights of Way and Bridleways**

4.2.32 A minimum standoff distance of 126.5m (i.e. topple distance) from public rights of ways and 200m from bridleways was used in the design of the turbine layout. Wherever possible the distance from turbines to public Rights of Way has been maximised. This approach allows all of the public Rights of Way to remain open
throughout the operational life of the development, with no stopping up orders or diversions required. Some diversion may be required during the construction phase to comply with the appropriate health and safety requirements, but these will be of a short term, temporary nature.

4.2.33 All turbines have also been located so as to provide a standoff distance of 126.5m (i.e. topple distance) from public roads. Any micro-siting of the turbines will ensure this minimum standoff distance is maintained. In addition, Highways Agency (HA) guidance states that they consider a set back distance of tip height plus 50m from the edge of their land should be adopted. With a blade to tip height of 126.6m it was not possible to accommodate this additional 50m set back for Turbines 3 and 6, due to a number of other constraints exerting an influence over the turbine layout. Therefore, Turbines 3 and 6 will have a blade to tip height of 121m in order to ensure compliance with HA guidance.

<table>
<thead>
<tr>
<th>Table 4.1</th>
<th>Summary of the Design Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue Addressed</strong></td>
<td><strong>Detail of Change</strong></td>
</tr>
<tr>
<td>Starting Point following site identification process by EC&amp;R (energy optimisation only)</td>
<td>EC&amp;R feasibility study identified that seven turbines with a blade tip height of up to 126.5m could be potentially accommodated.</td>
</tr>
<tr>
<td>Adjacent land use</td>
<td>Turbines have been located at least 46.5m away from the development site boundary to avoid blade overhang onto neighbouring land</td>
</tr>
<tr>
<td>Public roads and Public Rights of Way</td>
<td>Turbines have been located at least 126.5m (i.e. topple distance) away from these features in accordance with PPS22</td>
</tr>
<tr>
<td>Bridleways and byway open to all traffic</td>
<td>Turbines have been located at least 200m away from these features in accordance with PPS22</td>
</tr>
<tr>
<td>Telecommunication links</td>
<td>Turbines have been located at least 145m from the BT telecommunications link which crosses the development site. Following a JRC study turbines have been located at least 860m from the telecommunications mast to the north west of the development site.</td>
</tr>
<tr>
<td>Watercourses and waterbodies</td>
<td>Proposed turbines have been located at least 20m from watercourses and waterbodies (e.g. ponds) located on the development site, 50m from the River Ise.</td>
</tr>
<tr>
<td>Source protection zones and flood risk areas identified by the Environment Agency</td>
<td>No infrastructure related to the proposed Kelmarsh Wind Farm has been located in these areas</td>
</tr>
<tr>
<td>Badgers</td>
<td>Proposed turbines have been located at least 40m from any badger setts on the development site.</td>
</tr>
<tr>
<td>Bat flight lines</td>
<td>There are a large number of hedgerows crossing the development site which are potentially used as bat flight lines. Bats are a European protected species thus it was necessary to provide a stand-off distance of at least 50m from blade tip to any hedgerows on the development site. This distance has been calculated in accordance with Natural England’s (February 2009) Bats and Onshore Wind Turbines Interim Guidance TIN05.</td>
</tr>
<tr>
<td>Issue Addressed</td>
<td>Detail of Change</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Separation distances</td>
<td>It is necessary to ensure adequate separation distance perpendicular to, and in line with, the prevailing wind direction. Separation distances are necessary to minimise turbulent interaction (wake effect) between the turbines which would affect the power generation capacity of the wind farm.</td>
</tr>
<tr>
<td>Noise</td>
<td>It was necessary for noise levels at nearby residential receptors to meet the limits derived from the approach set out in <em>ETSU-R-97 The Assessment and Rating of Noise from Wind Farms</em>.</td>
</tr>
<tr>
<td>Landscape and visual amenity (including concerns raised by residents of Haselbech and Naseby during consultation)</td>
<td>In order to minimise the visual impact upon nearby receptors (including residents of Haselbech and Naseby) the east-west extent of the turbine layout was reduced from ~1.8 km to ~1 km reducing the extent of the visible array from nearly receptors to the north and south and increasing the distance between the nearest turbine and Naseby battlefield from ~1.4 km to ~2.3 km. This has also reduced the elevation of the highest turbine from ~171m Above Ordnance Datum (AOD) to ~156 mAOD effectively reducing the visible extent of the highest turbine by 15m when viewed from many locations to the north, west and south. The visual review also informed the decision that all turbines were to be situated to the east of the public byway which bisects the development site thereby removing visually isolated outline turbines from the design layout. Specifically a decision was taken not to pursue the option of an eighth (outlier) turbine which could be accommodated to the south of Tallyho Covert due to the visual impact upon Haselbech.</td>
</tr>
<tr>
<td>Archaeological impact</td>
<td>Proposed Turbine 5 was moved to the south west to avoid crop patterns identified through a geophysical survey.</td>
</tr>
<tr>
<td></td>
<td>The access track routes to Turbines 3 and 5 were also modified to avoid these features.</td>
</tr>
<tr>
<td></td>
<td>Crane pad position for Turbine 4 was modified to avoid archaeological features identified through geophysical survey.</td>
</tr>
<tr>
<td>Existing trees and hedgerows</td>
<td>The access track routes were modified to incorporate existing field entrances and to avoid mature trees wherever possible.</td>
</tr>
<tr>
<td>Landowner interests</td>
<td>The route of access tracks to Turbines 3, 5, 6 &amp; 7 were modified as a result of discussions with tenant farmers. The construction compound was moved to the west at the request of the tenant farmer concerned.</td>
</tr>
<tr>
<td>Highways Agency</td>
<td>The blade tip height of the two closest turbines to the A14, Turbines 3 and 6, has been reduced to 121m in order to comply with internal Highways Agency guidance that turbines should be situated at least tip height + 50m from highway land.</td>
</tr>
<tr>
<td>End Point</td>
<td>Five turbines with a blade tip height of up to 126.5m and two turbines with a blade tip height of up to 121m.</td>
</tr>
</tbody>
</table>

4.2.34 The starting point in the constraints analysis was for the potential of seven turbines with a blade tip height of up to 126.5m, whilst a number of design constraints were identified, the development site has the potential to accommodate five turbines with a blade tip height of up to 126.5m, and two turbines with a blade to tip height of up to 121m.
5. The Design

5.1 Introduction

5.1.1 This section provides an explanation of the design principles and concepts that have been applied to the various elements that constitute the wind farm design and are described in terms of the following: use, amount, layout, scale, landscaping and appearance of the proposed development.

5.1.2 The proposal for which planning permission is sought consists of:

“A wind energy development comprising of the erection, 25 year operation and subsequent decommissioning of seven wind turbines, together with a new vehicular access off Rectory Lane (the minor road between Kelmarsh and Haselbech Grange), on-site-access tracks, hard standing areas, control building and cabling, and a permanent anemometer mast, on land to the south of the A14, approximately 1.4km south west of Kelmarsh Village at National Grid Reference E472191 N278584.”

5.2 Scheme Layout and Local Context

Scheme Objective

5.2.1 The purpose of the scheme is the generation of electricity and the total capacity of the Kelmarsh Wind Farm based on seven 2.3 MW turbines (the reference turbine) will be 16.1 MW. The net capacity factor of the Kelmarsh Wind Farm has been calculated as 33%. As this is subject to confirmation following the completion of wind monitoring on site electricity production over a range of capacity factors has been given.

5.2.2 Taking into account that the turbines will not operate at full capacity all of the time the amount of electricity produced by the proposed wind farm (using the reference turbine) has been estimated to be in the order of 35,259 MWhr per year to 49,363 MWhr per year.

Scheme Layout

5.2.3 It is proposed to construct and operate a wind farm comprising seven wind turbines and ancillary infrastructure (including access tracks and a control building) which will

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3 Five with a maximum overall tip height of up to 126.5m and two with a maximum overall tip height of up to 121m

4 Depending on the actual choice of wind turbine (as detailed in Section 1.4.3) total capacity may vary between 14 MW and 17.5 MW
be connected to the turbines. During construction, a temporary compound will also be required to house a site office and welfare facilities.

5.2.4 The layout of the proposed Kelmarsh Wind Farm is shown in Figure 3.1, ES Volume 2. Each 93m diameter turbine will occupy approximately 0.68 ha\(^5\) and each 82m diameter turbine approximately 0.53ha. The physical footprint of the turbines and associated infrastructure will be approximately 3.2 ha.

5.3 Wind Turbine

5.3.1 The maximum height to blade tip will be a combination of the hub height and rotor diameter. For the purpose of the Environmental Impact Assessment (EIA) the reference turbines used to assess effects is the SWT-2.3 (2.3MW) machine which has a hub height of 80m and a rotor diameter of 93m or 82m depending on the model chosen. They are of the horizontal axis type, with a rotor consisting of three blades of 93m and 82m in diameter, respectively. The blades are mounted to the wind turbine hub, or nacelle, at a height of 80m giving, with the 93m diameter model, a maximum blade to tip height of 126.5m and with the 82m diameter model a maximum 121m tip height.

5.3.2 A transformer, located within the nacelle or tower of the turbine or immediately adjacent to it in a small kiosk (typically 3.1m x 2.4m x 2.7m, such that they are generally indistinct from the tower base unless viewed close up or in silhouette against the skyline at greater distances), steps up the voltage to 33kV which is then fed to the control building via underground electrical cabling linking all of the turbine unit transformers. At the proposed Kelmarsh Wind Farm it is anticipated that turbine transformers will be mounted internally within the wind turbines.

5.3.3 The electricity generated by the wind farm will be metered and fed into the electricity distribution network to which it is connected.

Turbine Foundations

5.3.4 Construction of the turbine foundations will involve the excavation of soil and subsoil to expose the underlying load bearing strata or bedrock, any topsoil and other vegetation removed will be laid on the surrounding undisturbed vegetation until required for reinstatement.

5.3.5 The load bearing strata or bedrock will be levelled off and blinded prior to the in-situ casting of the steel-reinforced concrete slab that will be about 18m in diameter. The depth of the excavation will be approximately 2m, depending on the depth of the load bearing strata or bedrock, and the sides will be battered back to ensure that they remain stable during construction.

5.3.6 On top of the slab a concrete up-stand will then be cast, to which the turbine tower will later be bolted. The excavated area will be backfilled with compacted layers of graded material from the original excavation, and capped with topsoil. The exact

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\(^5\) The area of land over which the turbine blades can rotate (not the physical footprint) calculated using \(\pi r^2\) based on a 46.5m rotor radius (rotor diameter of 93m) or 41m rotor radius (rotor diameter of 82m)
details of each foundation will vary across the site in response to the actual ground conditions encountered. A detailed ground investigation will be undertaken prior to construction to establish the requirement at each foundation.

5.3.7 Turbine excavations may be open for four to eight weeks during the construction programme. During this time, excavations will be kept free from water (rainwater and run-off). If local topography permits, the excavations will be free draining. If not, excavations may be mechanically pumped, with all dewatering works carried out in accordance with Environment Agency pollution prevention guidelines including discharges through either settling ponds, swales or mechanical silt traps.

Temporary Works: Construction Compound

5.3.8 It is proposed that one temporary construction compound of approximate dimensions 50m x 50m and a depth of up to 600mm will be used. This compound will include: an area for portacabins to be used for site offices and for the storage of various materials and small components; car parking; and welfare facilities. Foul drainage will either be collected in a holding tank for regular collection and disposal off site or be connected to the existing sewer facilities subject to agreement with Anglian Water.

Control Building

5.3.9 The turbines will be connected through suitable switchgear to be installed in a small control building on site. The control building compound will comprise a hard standing with maximum dimensions of approximately 10m x 20m for use as car parking and a single storey building approximately 14.14m x 8m which will house switchgear, metering, protection and control equipment as well as welfare facilities.

5.3.10 The colour of the control building will be selected in order to blend with the existing building colours for the area.

On Site Access Tracks

5.3.11 It is anticipated that approximately 4.27km of on site access track will be required for the development. 1.7km of this is existing access track which is in good condition and will not require any significant upgrading. 2.57km of new access track is therefore required on site. All new access tracks will be unpaved and constructed from material sourced from off-site quarries.

5.3.12 Owing to the size of some of the turbine components, all on site access tracks will have to be a minimum of 5m wide with some additional localised bend widening to a maximum of 13m. Temporary passing places (15m x 15m) will also be provided every 300m (or as required) to facilitate traffic movements. The location of the site access tracks is shown in Figure 3.1, ES Volume 2.

Wind Turbine Erection

5.3.13 Wind turbine towers, blades and nacelles will be transported to site via low bed trailers, some with rear steering. The towers will be delivered in three or four sections, which would normally be stored at each turbine lay-down area until lifted into position. Some storage of components may also be required at the construction
compound dependent on weather conditions and access track construction progress at the time of delivery.

5.3.14 It is anticipated that a single team will erect the turbines, using either two cranes (expected to be a 800t lattice tower crane with a 200t pilot or secondary crane assisting with the lift procedure) to lift the tower sections, nacelle and rotor into place. The construction contractors would determine the actual cranes used, together with the exact programme and number of teams on site.

Electrical Connections On-Site

5.3.15 Underground cables will link the turbines to the on site control building. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 1,000mm deep and up to 750mm wide. Cables will be laid in coarse sand or other granular material, and the trenches will then be backfilled with excavated soil and sub-soil which has been sieved and graded to remove stones.

5.4 Construction of the Wind Energy Development

Indicative Programme

5.4.1 Construction of the proposed Kelmarsh Wind Farm will last approximately 12 months and will consist of the following principal activities:

- Site establishment - erection of the construction compound and new site access;
- Construction of on site access tracks and crane hard-standing areas to facilitate erection of turbines;
- Construction of turbine and anemometer mast foundations;
- Construction of the control building;
- Excavation of trenches and cable laying adjacent to access tracks followed by connection of on site distribution and signal cables;
- Delivery and erection of wind turbines and permanent meteorological mast;
- Commissioning of site equipment; and
- Site restoration and operation.

5.4.2 Where possible operations will be carried out concurrently (thus minimising the overall length of the construction programme) although predominantly in the order identified. In addition, development will be phased such that at different parts of the site, the civil engineering works will be continuing whilst wind turbines are being erected. Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.

5.4.3 An indicative programme for construction activities is shown in Table 5.1. The starting date for construction activities is largely a function of the date that consent
might be granted and subsequently the programme will be influenced by constraints on the timing and duration of any mitigation measures.

### Table 5.1  Indicative Construction Programme

<table>
<thead>
<tr>
<th>Activity</th>
<th>2011</th>
<th>2012</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Jan</td>
<td>Feb</td>
</tr>
<tr>
<td>Kelmarsh</td>
<td></td>
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<tr>
<td>Site Establishment</td>
<td></td>
<td></td>
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<tr>
<td>Cranes Pads &amp; Hard standings &amp; tracks</td>
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<td></td>
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<tr>
<td>WTG Foundations</td>
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<tr>
<td>Sub Station Construction</td>
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<tr>
<td>On Site Cabling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WTG Delivery &amp; Erection</td>
<td></td>
<td></td>
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<tr>
<td>Commissioning &amp; Testing</td>
<td></td>
<td></td>
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<tr>
<td>Commercial Operation</td>
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</tr>
</tbody>
</table>

**Construction Plant/Erection of Turbines**

5.4.4 A range of equipment including earth movers, mechanical excavators and dump-trucks is expected to be delivered to site when construction commences and removed upon construction completion.

5.4.5 Two cranes (expected to be an 800t lattice tower crane with a 200t pilot or secondary crane assisting with the lift procedure) are necessary to lift the tower sections, nacelle and rotor into place.

5.4.6 In total, the delivery and removal of plant and equipment would result in 280 two-way traffic movements.

**Construction Materials**

5.4.7 Stone and sand materials for on site access tracks, construction compound, cable trenches and the crane pads are expected to be sourced from local quarries. Approximately 17,444 tonnes of stone and 1,350 tonnes of sand (for cable trenches) will be imported to site from local quarries. [http://yell.com/ucs/HomePageAction.do](http://yell.com/ucs/HomePageAction.do) was used to identify the nearest quarries to the development site. As noted above, existing on-site access tracks will be utilised where possible in order to minimise the amount of stone that is required to be imported to site.

5.4.8 Approximately 3,638m³ of concrete will be imported to site from ready mix plants for construction of the turbine foundations and control building foundations. In the unlikely event that on site batching is required, particular attention will be paid to the design of the storage area the environmental impacts such as dust, noise and run-off. [http://www.qsrmc.co.uk/index2.php](http://www.qsrmc.co.uk/index2.php) was used to identify the nearest concrete supplier to the development site.

5.4.9 Other materials required include geo-grid for the access tracks, cabling, formwork and reinforcing steel for the concrete bases.
Site Restoration after Construction

5.4.10 Site restoration will mainly occur at the edges of any working areas, principally alongside access tracks, crane pads and turbine foundations. Any excavated material will be disposed off around these locations, being used to dress back working areas to facilitate re-vegetation or agricultural re-use. Where existing vegetation exists this will be removed and stored separately prior to re-use as the top layer of any restored areas. This approach will maximise the potential for natural re-vegetation from the natural seed bank. In the majority of cases (alongside tracks) the restoration will occur within a few days of the removal and so desiccation of any vegetation will be unlikely.

5.5 Decommissioning of the Wind Energy Development

5.5.1 The wind farm will be designed with an operational life of 25 years. At this time it is expected that the site will be decommissioned and the turbines dismantled and removed. Any alternative to this action would require consent from Daventry District Council and so is not considered in this application or assessed in the ES.

5.5.2 During decommissioning the bases would be broken out to below ground level. All cables would be cut off below ground level, de-energised and left in the ground. Access tracks would be left for use by the landowner. No stone would be removed from the site. The decommissioning works are estimated to take six months. This approach is considered to be less environmentally damaging than seeking to remove foundations and cables and roads entirely.

5.5.3 On completion of decommissioning farming activities can resume over the foundations of the turbines.
6. Access

6.1 Introduction

6.1.1 This part of the Design and Access Statement is intended to cover two related issues: one is concerned with providing detail on the general movement to, from and through the proposed Kelmarsh Wind Farm and its buildings. The other is concerned with how all members of society will be able to use the development site.

Off-site Access

6.1.2 In 2007 Entec undertook an access study to review potential access routes to the proposed Kelmarsh Wind Farm (Figure 12.1, ES Volume 2). Based on the outcome of the access study two route options for the delivery of construction materials and equipment to the development site have been identified, with Route Option 1 being preferred for abnormal loads. The two route options are identified in Figure 12.1, ES Volume 2.

6.1.3 Route Option 1 assumes that construction traffic will travel from the A14(T) Junction 2 then continue north on the A508 for approximately 500m before turning left onto an Unnamed Road(A) (known locally as Rectory Lane). Construction vehicles will travel south on the Unnamed Road(A) which crosses over the A14(T) before navigating a right-hand bend. Immediately after the bend, there is an existing access into the development site which will be upgraded for access into the proposed Kelmarsh Wind Farm.

6.1.4 Route Option 2 assumes that construction traffic will travel from the A14(T) Junction 2 then continue south on the A508 for approximately 400m before turning right onto an Unnamed Road(B) (known locally as Haselbech Road). Construction vehicles will travel west on the Unnamed Road(B) for approximately 700m before navigating a right-hand turn onto Unnamed Road(A) (known locally as Rectory Lane) from which the development site will be accessed.

6.1.5 For normal delivery vehicles it is anticipated a one way system will be implemented such that Route Option 1 will be used for incoming traffic and Route Option 2 will be used for outgoing traffic, or vice versa, in order to minimise disruption to properties located along Rectory Lane.

6.1.6 Based on the recommendations of the access study (Figure 12.1, ES Volume 2) all abnormal loads will follow Route Option 1 in and out of the development site. Route Option 2 is not suitable due to the presence of Scotland Wood at the junction of the A508 and Unnamed Road (B) known locally as Haselbech Road.

6.1.7 Due to the abnormal size and loading of wind turbine delivery vehicles it is necessary to review the route options to identify if any works are required to accommodate them.
Swept path analysis\textsuperscript{6} was undertaken for Route Option 1. It was confirmed that there were pinch points along this route but that works to accommodate abnormal loads would be minor in nature (removal of signs and traffic islands, trimming of trees, construction of hardstanding etc.) and that any necessary improvements to junctions could be accommodated within the public highway and without the need to involve third party land.

6.1.8 The detailed off-site access requirements will be confirmed with the Highways Agency and Northamptonshire County Council’s Highways Department once the exact access requirements are established. Traffic management systems will be put in place to ensure safe operation and these will be established through consultation with the aforementioned authorities. EC&R would also invite feedback from local residents.

Site Access

6.1.9 There will be one principal point of access to the development site off Unnamed Road(A) (known locally as Rectory Lane) running from Kelmarsh to Haselbech Grange.

6.1.10 There is an existing access into the development site at this location which will be upgraded to accommodate construction traffic.

6.1.11 Once operational an alternative access to the development site exists via the minor road which runs beneath the A14(T) and this may be used on occasion by light vehicles to access the control building.

Public Rights of Way

6.1.12 The proposed Kelmarsh Wind Farm is not intended for use by the general public. However, consultation with Northamptonshire County Council (NCC) has identified that one Public Right of Way (PRoW) runs through the development site. This is recorded on Ordnance Survey mapping as a byway open to all traffic, and is approximately 2.1km in length.

6.1.13 There is also a bridleway which runs alongside the northern side of the A14(T) approximately 50m to the north of the development site boundary and a footpath which runs from the southern site boundary southwards past Haselbech Grange.

6.1.14 There is no other public access to the site but the land is farmed by a number of tenant farmers.

6.2 Effects on the Highway

6.2.1 The main transportation impacts will be associated with the movements of commercial Heavy Goods Vehicles (HGVs), generated by the project’s construction, to and from

\textsuperscript{6} Swept Path Analysis uses computer modelling to simulate the trafficking of abnormal loads at sections of roads where there may be issues with the existing road geometry. The results give an indication of any remedial works required to accommodate the delivery vehicles.
the development site. These will occur during the construction phase of the development on the A508 and two local roads, known as Rectory Lane and Haselbech Road. The A508 (between Junction 2 of the A14(T) and Rectory Lane) and Haselbech Road have not been identified as ‘sensitive’ due to their open, rural setting, sided by grass verges, with no residential properties directly fronting the carriageway. Rectory Lane is classified as ‘sensitive’ as the entrance to Kelmarsh Hall, the Buddhist Centre and Rectory Farm are off this road.

6.2.2 This assessment has identified the construction period as the only phase in the lifecycle of the proposed Kelmarsh Wind Farm where potential effects from traffic may be anticipated.

6.2.3 The impact of construction-related traffic on the A508 has been calculated, in percentage terms, relative to the background traffic during the opening year of construction (2011). The percentage impact exercise shows that the maximum impact on the A508 is a 16.7% increase in HGVs during normal construction activities, and a 78.7% increase in HGV traffic on the seven days involving concrete deliveries. Therefore a detailed assessment of effects on the A508, Rectory Lane and Haselbech Road has been undertaken.

6.2.4 The assessment has concluded that (excluding concrete deliveries, which will only occur over seven days) an additional 36 HGVs per day would not have a significant effect on the traffic and transport related issues identified, i.e. severance; driver delay; pedestrian delay; pedestrian amenity and fear and intimidation. This is because any pedestrian disturbance or road safety concerns caused by construction traffic will be limited through the implementation of a Traffic Management Plan.

6.2.5 During the scoping stage the Highways Agency raised concerns regarding the turbines being in line of sight from the A14, causing visual distraction. Further details of the turbine locations have been provided to the Highways Agency showing that the wind farm will be clearly visible from either direction so as to not suddenly cause a distraction to drivers on this trunk road. Furthermore, the development is in accordance with PPS22 in that the turbines are set back at least 126.5m from the edge of the A14. Subsequently, the blade to tip height of the two closest turbines to the A14 has been reduced to 121m in order to comply with internal Highways Agency guidance that turbines should be situated at least tip height + 50m from Highways Agency land.