



# BEACON FEN

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Chapter 17: Other Environmental Topics

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# 17. Other Environmental Topics

## 17.1 Introduction

17.1.1 This chapter presents the consideration of environmental topics that were either:

- Scoped out of the Environmental Impact Assessment (EIA) for this Environmental Statement (ES) and, therefore, not required to have an individual chapter in this ES; or
- Owing to the nature of the Proposed Development and to maintain proportionality, were considered to not warrant an individual chapter. Whilst not included as individual chapters, these topics remain as part of the wider EIA (where relevant) for consideration, here.

17.1.2 The following environmental topics were confirmed to be scoped out of the ES in **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.2)** provided by the Planning Inspectorate (PINS) in May 2023. In response to the feedback from PINS and to ensure a proportionate ES, these topics have not been discussed further:

- Wind Microclimate; and
- Daylight, Sunlight and Overshadowing.

17.1.3 For environmental topics that have not been included as individual chapters, but which required further consideration or a standalone assessment, this was prepared to support the application. For completeness, these topics are summarised in this chapter and include the following:

- Arboriculture (**Appendix 6.6 Arboricultural Impact Assessment (Document Ref: 6.3 ES Vol.2, 6.3.18)**).
- Ground Conditions (**Appendix 17.1 Ground Conditions Desk Study (Document Ref: 6.3 ES Vol.2, 6.3.81)**).
- Waste (**Appendix 17.2 Waste and Recycling Strategy (Document Ref: 6.3 ES Vol.2, 6.3.82)**).
- Major Accidents and Disasters.
- Utilities, Telecommunications and Television Reception.
- Human Health.
- Electromagnetic Fields.
- Health & Safety Executive.

## 17.2 Arboriculture

### Introduction

17.2.1 The responses provided within Appendix 2 of **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.2)** indicated that the ES should be accompanied by a tree survey and constraints plan of green infrastructure likely to be impacted by the Proposed Development, undertaken to BS5837 standards.



## Summary

17.2.2 A BS5837:2012 arboricultural survey and impact assessment was undertaken by Wardell Armstrong (Part of SLR) (WA) to support the application. The **Arboricultural Impact Assessment (AIA)** is presented in **Appendix 6.6 (Document Ref: 6.3 ES Vol.2, 6.3.18)**.

17.2.3 During the field survey, a small number of veteran/ancient trees were identified. None of the trees on or immediately adjacent to the DCO Order Limits (hereafter referred to as 'the Site') are protected by a Tree Preservation Order (TPO) or Conservation Area (CA) status. There are no listed traditional orchard or woodpasture and parkland priority habitats within or immediately adjacent to the Site.

17.2.4 Table 17.1, below, details the field survey results and the percentage of each category of tree quality for individual trees and tree groups. BS5837:2012 states that category 'A' trees are the highest quality, 'B' trees are of moderate quality and 'C' trees are considered to be of low quality. Category 'U' trees are in such a poor structural and/ or physiological condition that they have a predicted life expectancy of less than ten years.

**Table 17.1 Individual Trees and Tree Groups Field Survey Results**

SITE AREA	Category A	Category B	Category C	Category U
Solar Array	Individual 4% Groups 1%	Individual 27% Groups 37%	Individual 61% Groups 61%	Individual 8% Groups 1%
Cable Route	Individual 5% Groups 1%	Individual 43% Groups 37%	Individual 41% Groups 61%	Individual 11% Groups 1%
Bespoke Access Road	Individual 31% Groups 0%	Individual 35% Groups 80%	Individual 31% Groups 20%	Individual 3% Groups 0%

17.2.5 To facilitate the Proposed Development, small numbers of trees and sections of hedgerows would need to be removed. The impact on local amenity and ecosystem services benefits from the required tree and hedgerow removals and the non-removal impacts are considered to be very low for a development of this scale<sup>1</sup>.

17.2.6 Table 17.2, below, provides a summary of the proposed mitigation and/or compensation in relation to arboricultural impacts.

**Table 17.2 Proposed Mitigation/Compensation**

Proposed Works	Mitigation/Compensation
Trees removed as part of the Proposed Development	In addition to the retention of existing vegetation, new planting will be undertaken at the Site (see <b>Figure 6.31 Landscape Strategy Plan (Document Ref: ES Vol.3, 6.4.42)</b> ). This will be secured by <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> and <b>Appendix Outline Landscape &amp; Ecological Mitigation Plan (OLEMP) (Document Ref: 6.3 ES Vol.2, 6.3.19)</b> .

<sup>1</sup> **Figure 6.31 Landscape Strategy Plan (Document Ref: ES Vol.3, 6.4.42)** illustrates the proposed vegetation retention and enhancements.

Proposed Works	Mitigation/Compensation
	<p>The planting will improve the visual amenity of the local landscape and provide additional habitat for wildlife. Additionally, as a large proportion of the tree population is made up of ash trees, additional planting would help to compensate for those trees that may be lost to Ash Dieback Disease over the lifetime of the Proposed Development.</p>
Pruning of trees and hedgerows	<p>Tree pruning is to be undertaken by a competent and insured arborist (tree surgeon) working in accordance with BS 3998:2010. This will be secured by <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> and <b>Appendix Outline Landscape &amp; Ecological Mitigation Plan (OLEMP) (Document Ref: 6.3 ES Vol.2, 6.3.19)</b>.</p>
Solar PV arrays, tracks and fencing proposed within the buffer zones and the Root Protection Areas (RPA) of veteran trees	<p>A buffer zone for each recorded veteran tree, which is 15 times their stem diameter or 5m beyond the trees crown spreads (whichever is greater), is plotted on the Tree Protection Plan Ref. ST19595-106 Rev. B within <b>Appendix 6.6 Arboricultural Impact Assessment (Document Ref: 6.3 ES Vol.2, 6.3.18)</b>. This will be secured by <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b>.</p> <p>Where the veteran tree buffer zones extend beyond Site security fencing, these areas will be protected by Tree Protection Fencing, as described in BS 5837:2012 – Trees in relation to design, demolition and construction. The fencing will be erected prior to the commencement of the Proposed Development construction and decommissioning works and will remain in place throughout the development construction and decommissioning processes for the duration of any affecting works (i.e. if there is no risk of works affecting the RPAs, the fencing may be removed but would need to be reinstalled should the situation revert).</p> <p>The protection of the veteran trees will be detailed in an Arboricultural Method Statement (AMS) (secured by the <b>OCEMP (Document Ref: 6.3 ES Vol.2, 6.3.7)</b>) and updated Tree Protection Plan (TPP) (at the detailed design stage) for the Proposed Development.</p>
Proposed security/ Site fencing installed within the crown/ canopy footprints and/ or RPAs of	<p>Site security fencing shall be moved outside the affected trees' Root Protection Areas (RPA) and veteran tree buffer zones, wherever possible. Where it is not possible, installation shall be completed utilising hand tools only, under the supervision and direction of the Project Environmental Manager . As</p>

Proposed Works	Mitigation/Compensation
retained trees and hedgerows	referred to in <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> and <b>Appendix 6.6 Arboricultural Impact Assessment (Document Ref: 6.3 ES Vol.2, 6.3.18)</b> ground protection measures are to be installed prior to the commencement of the fencing works within any RPAs and veteran buffer zones. A method statement for the fence installation works within the trees RPA and veteran tree buffer zones will be detailed in the AMS for the Proposed Development.
Development in proximity to retained trees and hedgerows	<p>Site fencing, such as post-and-wire fencing for hedgerow protection and Heras Tree Protection Fencing, will be installed in accordance with BS 5837:2012 guidance and prior to the commencement of the Proposed Development, including the installation/ construction of any required grounds works, temporary access tracks, permanent hard standing, substations, solar PV arrays and associated other infrastructure. The fencing shall be retained for the duration of any affecting works during the construction/ installation and dismantling works (i.e. if there is no risk of works affecting the RPAs, the fencing may be removed but would need to be reinstalled should the situation revert).</p> <p>The installation of cabling through any RPA of retained trees and hedges would follow the processes that will be set out in the AMS (to be secured via the <b>OCEMP (Document Ref: 6.3 ES Vol.2, 6.3.7)</b>).</p>
Construction/ access roads for installation of grid connection route	<p>The proposed vegetation removal and retention is illustrated upon <b>Figure 6.31 Landscape Strategy Plan (Document Ref: 6.4, ES Vol.3, 6.4.42)</b> and <b>Figure 6.32 Vegetation Removal Plan (Document Ref: 6.4, ES Vol.3, 6.4.43)</b>. At the detailed design stage of the Proposed Development, the Proposed Development design shall avoid retained trees' RPAs where feasible. For instances where this is not feasible, the specification for track construction within RPAs that minimises harm to the affected trees' roots and surrounding soil will be detailed in the Arboricultural Method Statement (AMS) (to be secured via the <b>OCEMP (Document Ref: 6.3 ES Vol.2, 6.3.7)</b>).</p> <p>.</p>
Construction access roads to be installed	As identified within <b>Appendix 6.6 Arboricultural Impact Assessment (Document Ref: 6.3 ES Vol.2, 6.3.18)</b> , there is an existing stone access track (required for the Cable Connection installation) that



Proposed Works	Mitigation/Compensation
within veteran tree buffer zone	falls within the Root Protection Area (RPA) of a veteran tree (i.e. tree T1124, which is an 'A Grade Veteran' tree). As it is an existing track, any potential damage to the tree's roots and soil beneath the footprint of the track occurred previously. At this stage, no other tracks pass through the RPA of any veteran trees. During the detailed design stage, the final design of the construction access tracks will be confirmed. If it is necessary to refurbish and / or upgrade the existing access track through the RPA of T1124, this would be done under the appropriate working measures as per the Arboricultural Method Statement (AMS) (to be secured via the <b>OCEMP (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> ).
Decommissioning and removal of development infrastructure	Decommissioning works to be in accordance with <b>Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)</b>

## Conclusion

- 17.2.7 The number of trees and sections of hedgerows to be removed have been kept to a minimum. Furthermore, the identified mitigation measures are anticipated to minimise the risk of potential harm occurring to retained trees and hedgerows from works associated with the construction and decommissioning of the Proposed Development. The trees and hedgerows that have been retained on the Site will be protected during the proposed (construction and decommissioning) works, with fencing appropriate to the Proposed Development intensity type and what is being protected.
- 17.2.8 It is likely that the change of use from agricultural land to a renewable energy solar development will improve the growing conditions for many of the trees onsite, including the veteran/ ancient trees. This is due to modern farming methods including such methods as ploughing within RPA and veteran buffer zones. Also, the use of chemicals, which would cease as a result of the Proposed Development, can also be harmful to soil biota<sup>2</sup> that trees and hedgerows rely upon, and can be detrimental to tree and hedgerow health.

## 17.3 Ground Conditions

### Introduction

- 17.3.1 PINS agreed that, based on **Appendix 1.1 Scoping Report (Document Ref: 6.3 ES Vol.2, 6.3.1)**, significant effects on Ground Conditions during construction and operation are unlikely, but required the results of a Phase 1 Ground Conditions and Contamination Desk Study to be provided and for the ES to assess significant effects on ground conditions where they are likely to occur.

<sup>2</sup> See **Chapter 14 Soils and Agricultural Land (Doc. Ref: 6.2 ES Vol.1, 6.2.14)** of this Environmental Statement (**Doc. Ref: 6.2 ES Vol.1**) for further details on the impacts upon the soil resource as a result of the Proposed Development.

## Summary

- 17.3.2 A ground conditions desk study was undertaken by Wardell Armstrong to support the application for the Proposed Development and is presented at **Appendix 17.1 Ground Conditions Desk Study (Document Ref: 6.3 ES Vol.2, 6.3.81)**. The desk study summarised the available information relating to ground and the potential risks associated with ground and the Site.
- 17.3.3 The Site is considered to present an overall low risk from past land use, surrounding land use, ground instability and contamination. This is attributed to the fact that the Site has generally remained in agricultural use throughout history. Therefore, the likely sources of potential contamination are from agricultural activities and practices.
- 17.3.4 As part of the desk study, a Preliminary Conceptual Site Model (PCSM) was undertaken (see **Appendix 17.1 Ground Conditions Desk Study (Document Ref: 6.3 ES Vol.2, 6.3.102)**). This is a representation of the environmental processes that occur on and in the vicinity of a site and comprises an initial assessment of all potential contaminant linkages (i.e. source, pathway and receptor) for a site, with the risk of contamination based upon such factors as probability of contaminants being present, the sensitivity of the receptor and the consequence severity. The PCSM for the Site indicated a low risk to receptors, considering the nature of the identified potential sources, the sensitivity of the receptors and the probability of a viable source-pathway-receptor linkage being present. Significant contamination is not anticipated at the Site.
- 17.3.5 Any potential contamination risks at the Site would be adequately addressed through industry best practice in accordance with standard construction environmental management and occupational health procedures. An Outline Construction Environmental Management Plan (OCEMP) has been prepared to support this application in **Appendix 2.4 (Document Ref: 6.3 ES Vol.2, 6.3.7)**. To provide verification of the preliminary qualitative risk assessments of the desk study, during the detailed design stage, a geotechnical ground investigation will be conducted for design purposes and as per **Appendix 17.1 Ground Conditions Desk Study (Document Ref: 6.3 ES Vol.2, 6.3.102)** will incorporate contamination testing of the soils, informed by the findings of the desk study.

## Conclusion

- 17.3.6 Therefore, as per **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.1)**, given that significant effects in relation to ground conditions are not considered likely to occur, it was not considered proportionate for a standalone chapter on this topic to be included within this ES.

## 17.4 Waste

### Introduction

- 17.4.1 **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.1)** and feedback from consultees (see **Consultation Report (Document Ref: 5.1)**) indicated that the topic of Waste was to be included, with rows 2.1.5 and 3.11.9 of the Scoping Opinion requesting specific information, which is included with

Sections 4 to 7 of **Appendix 17.2: Waste and Recycling Strategy, 6.3 ES Vol.2, 6.3.103**. An assessment of the likely significant effects of construction and component replacement is considered and what measures will be put in place to manage construction and operational waste and, where possible, divert from the waste chain (discussed within Appendix 17.2). The Scoping Opinion also requested quantities and types of waste to be considered (also discussed within Appendix 17.2), and stated that any likely significant effects from the decommissioning phase, should be assessed to the extent that is possible at this stage.

## Summary

- 17.4.2 **Appendix 17.2: Waste and Recycling Strategy (Document Ref: 6.3 ES Vol.2, 6.3.82)** has been developed by Wardell Armstrong to support the application for the Proposed Development. The Waste and Recycling Strategy has been prepared as an indicative document that is intended to inform the preparation of Site Waste Management Plan (SWMP) during the construction and decommissioning phases of the Proposed Development. The SWMP will be prepared as part of the preparation of the detailed Construction Environmental Management Plan and the detailed Decommissioning Environmental Management Plan prior to construction and decommissioning of the Proposed Development. For further details relating to the preparation of the SWMP, please refer to Section 5 of **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and Section 1.12 of **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) Strategy (Document Ref: 6.3 ES Vol.2, 6.3.8)**. The Waste and Recycling Strategy considers the aims of international, national and local policy in regard to commitments to manage resources more efficiently in order to prevent and minimise waste where possible, to sustainably manage waste and increase overall recycling rates.
- 17.4.3 The construction phase of the Proposed Development is not anticipated to generate large amounts of waste owing to the absence of large-scale earthworks and the fact that the electrical infrastructure will be manufactured offsite and delivered for installation when required. The types of waste associated with construction include (but are not limited to) general waste from site welfare facilities, packaging waste from incoming materials, and waste from construction of supporting infrastructure, such as fencing and access tracks/ roads.
- 17.4.4 The Waste and Recycling Strategy provides an estimated calculation of site welfare waste using the anticipated worst-case number of staff during peak deployment during the construction phase. Approximately 169 tonnes per annum of welfare waste is anticipated. This is considered to have a negligible impact on the local waste management facilities expected to deal with the waste. Similarly, due to the small number of structures to be constructed as part of the Proposed Development, the wider construction waste volume is also estimated to be negligible.
- 17.4.5 Operationally, waste will be predominantly associated with equipment replacement and maintenance and largely made up of recyclable materials, such as metals. Based on experience from other solar developments of a similar scale across the UK, substantial numbers of panel replacement are not

anticipated. In addition, solar panel and associated infrastructure technology is advancing, and so too will the treatment and recycling of solar development structures.

- 17.4.6 In terms of equipment, battery waste and the management of inverters and electrical grid infrastructure, is likely to be feasible via specialist waste electrical and electronic equipment (WEEE) waste providers and will be managed in accordance with relevant legislation.
- 17.4.7 As the lifespan of the Proposed Development is ~40 years, it is not possible at this stage to identify either the waste management routes or specific waste facilities to be utilised during the decommissioning phase. Nationally, there are limited off-takers, none of which currently process materials beyond initial shredding and metal separation. This market is anticipated to grow and evolve, and any waste generated during the decommissioning phase will be managed in a phased approach, in accordance with **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref 6.3 ES Vol.2, 6.3.8)** that has been prepared to support the application.

## Conclusion

- 17.4.8 Significant effects in relation to waste are not considered likely to occur due to the measures set out in **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref 6.3 ES Vol.2, 6.3.8)**, and appropriate legislative controls that are in place meaning that waste can be effectively managed throughout each stage of the Proposed Development.

## 17.5 Major Accidents and Disasters

### Introduction

- 17.5.1 The Infrastructure Planning (Environmental Impact Assessment (EIA)) Regulations 2017 (the 'EIA Regulations') state that an EIA should include a *"description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned"*.
- 17.5.2 'Risk' can be defined as the likelihood of an impact occurring, combined with the effect or consequence(s) of the impact on a receptor, if it does occur. A 'major accident' can be defined as events that threaten immediate or delayed serious damage to human health, welfare and/or the environment. A 'disaster' can be defined as naturally occurring extreme weather events or ground-related hazard events with the potential to cause an event or situation. Disaster and natural disaster are often used interchangeably.
- 17.5.3 Within **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.2)**, PINS confirmed that *"providing potential risks are assessed in the ES in relevant chapters and any relevant mitigation is secured through relevant management plans, the Inspectorate is content to scope this matter out"*.

## Summary

- 17.5.4 For the purposes of this ES, only those manmade and natural risks that are considered likely to occur have been considered. For them to be significant, the anticipated likely risk would result in substantial harm that the normal functioning of the Proposed Development is unable to cope with or rectify, or results in the loss of life or permanent injury, and/ or permanent long-lasting damage to an environmental receptor.
- 17.5.5 Table 17.3, below, sets out the accidents and disasters of relevance to the Proposed Development (based on the location of the Site and proposed land use) along with the corresponding ES chapter, assessment or management plan where relevant. The following accidents and disasters have been derived from the National Risk Register and feedback from consultees.

**Table 17.3 Major Accidents and Disasters associated with the Proposed Development**

Major Accident or Disaster	Potential Receptor	Relevant Chapter or Comment
Extreme weather events	Site users, energy network	The vulnerability of the Proposed Development from the risks posed from extreme weather events has been considered in <b>Chapter 12 Climate Change (Document Ref: 6.2 ES Vol.1, 6.2.12)</b> . The design and build of the Proposed Development will be sufficient to withstand extreme weather events in accordance with relevant regulations and building standards.
Flooding	Property and people in areas of increased flood risk	The risk of flooding at the Site along with the potential for the Proposed Development to increase the risk of flooding elsewhere are covered in <b>Chapter 11 Water Resources and Flood Risk (Document Ref: 6.2 ES Vol.1, 6.2.11)</b> . Flooding is also considered in <b>Chapter 12 Climate Change (Document Ref: 6.2 ES Vol.1, 6.2.12)</b> .
Fire	Local residents, habitats and species	The main potential hazard of Battery Energy Storage System (BESS) failure is thermal runaway and, if not controlled, fire. Consultation with Lincolnshire Fire & Rescue service and relevant legislation has influenced the overall Proposed Development design to ensure adequate siting of BESS and grid infrastructure away from sensitive receptors. This is discussed further below, and within the <b>Outline Battery Safety Management Plan (OBSMP) (Document Ref: 7.0 Other Reports, 7.2)</b> that has been prepared to support the application. The OBSMP includes (hydrogen fluoride (HF)) plume dispersion modelling.



Major Accident or Disaster	Potential Receptor	Relevant Chapter or Comment
Road accidents	Road users, habitats and species	The risk of road accidents and effects to road safety in relation to the Proposed Development including abnormal loads has been assessed in <b>Chapter 9 Access and Traffic (Document Ref: 6.2 ES Vol.1, 6.2.9)</b> and covered in <b>Appendix 9.4 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol.2, 6.3.57)</b> . Owing to the nature of the Proposed Development, <b>no significant effects</b> relating to hazardous loads are anticipated. Appropriate controls are also in place as referenced in <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP)</b> , regarding the management of import/export of materials and waste carriers.
Rail accidents	Rail users	An assessment of glint and glare on rail users is presented in <b>Chapter 13 Glint and Glare (Document Ref: 6.2 ES Vol.1, 6.2.13)</b> and identified that the effects from glint and glare will be <b>Not Significant</b> . As the Cable Route Corridor is intersected by a railway line, trenchless methods (such as horizontal directional drilling (HDD)) will be required. This is discussed further below and considered in <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> .
Aviation disasters	Pilots and aircraft users	An assessment of glint and glare on aviation receptors is presented in <b>Chapter 13 Glint and Glare (Document Ref: 6.2 ES Vol.1, 6.2.13)</b> and identified that the effects from glint and glare will be <b>Not Significant</b> .
Utilities failure	Employees and local residents	Utility searches have been undertaken. Via ongoing communications with the operators, potential impacts to known above and below ground utilities, as a result of excavation and engineering works associated with the construction of the Proposed Development, will be avoided or the assets protected. The management of potential utilities failure is, however, discussed in Section 17.6, below.
Plant disease	Habitats and species	New planting within the Proposed Development has been developed in line with the Landscape Institute guidance on Plant Health and Biosecurity <sup>3</sup> to comprise a

<sup>3</sup> Plant Health and Biosecurity: The Landscape Consultant's Toolkit LI Technical Guidance Note 01/19.

Major Accident or Disaster	Potential Receptor	Relevant Chapter or Comment
		planting mix of native species to limit the introduction of biosecurity risks from non-native plants. The proposed planting will be managed by <b>Appendix 6.7 Outline Landscape and Ecological Management Plan (OLEMP) (Document Ref: 6.3 ES Vol.2, 6.3.19)</b> and <b>no significant effects</b> in relation to plant disease are anticipated.
Criminal damage	Energy network	The security of the Site will be managed by the Contractor during construction and decommissioning (and by the Operator during operation) and will consist of safety measures such as security lighting, fencing and CCTV cameras where required. Full details of the security and safety measures incorporated into the Proposed Development design are detailed within Table and section of Chapter 2 Proposed Development (Document Ref: 6.2 ES Vol.1, 6.2.2) of this Environmental Statement,.
Unexploded Ordnance (UXO)	Employees and local residents	A Detailed UXO Risk Assessment was undertaken by Igne UXO limited to support the application and confirmed that the Site is at Low risk. This is included within Appendix 5 of <b>Appendix 17.1 Ground Conditions Desk Study (Document Ref: 6.3 ES Vol.2, 6.3.81)</b> . The mitigation measures presented in the assessment have been included in <b>Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)</b> .

## Fire

- 17.5.6 The Battery Energy Storage System (BESS) will be monitored by the onsite control systems, which will be active at all times and feed cloud monitoring services, and a 24/7 remote control room that will monitor for critical health and safety faults. Control room personnel will be experienced in both emergency response and the management of renewables and battery sites, trained for the specific BESS system installed on the site, and made aware of key local points of contact. Further information on fire safety can be found in the **Outline Battery Safety Management Plan (OBSMP) (Document Ref: 7.0 Other Reports, 7.2)**. Given the robust testing and stringent legislative controls that are in place regarding battery manufacture, significant effects in relation to fire are not considered to be likely and the topic, therefore, does not require further consideration within this ES.

## Rail Accidents

- 17.5.7 The railway, linking Heckington west to Sleaford and east to Swineshead, intersects the mid-section of the Cable Route Corridor. Trenchless techniques, such as horizontal directional drilling (HDD) will be utilised to construct the crossing of the Cable Route. The distance from (and depth below) the railway to where the crossing point will commence and emerge will be confirmed at the detailed design phase. The crossing will be managed in agreement with Network Rail as the operator of the railway. Protective provisions are required for the benefit of Network Rail along with engagement with their Asset Protection Engineers.
- 17.5.8 The works will be subject to detailed risk assessment and undertaken in line with the construction and environmental measures set out in **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) in (Document Ref: 6.3 ES Vol.2, 6.3.7)**. During the decommissioning phase of the Proposed Development, the cable route is proposed to remain *in situ*. Therefore, significant effects in relation to rail accidents are not considered likely and the topic does not require further consideration within this ES.

## Conclusion

- 17.5.9 Owing to the nature, scale, and location of the Proposed Development, it is not considered likely that there would be significant effects on the environment deriving from the vulnerability of the Proposed Development in relation to the risk of major accidents and disasters.

## 17.6 Utilities, Telecommunications & Television Reception

### Introduction

- 17.6.1 PINS were content that Utilities, Telecommunications and Television Reception could be scoped out of the ES providing the topic had been appropriately assessed and considered within the design, as the Proposed Development has the potential to affect such assets through construction and decommissioning of the Proposed Development.

### Summary

#### Utilities

- 17.6.2 As highlighted above, there is potential for utilities failure as a result of interaction through excavation and engineering works during construction and decommissioning of the Proposed Development.
- 17.6.3 Consultation with utility providers in the area has taken place to discuss protective provisions and inform statutory undertakers such as Anglian Water, National Grid Electricity Transmission, National Gas Transmission plc and Cadent Gas of the Proposed Development.
- 17.6.4 The utilities present within the Site consist of National Grid electricity lines (including both underground and overhead cables), private cables, Anglian Water mains infrastructure, private water mains, BT Openreach lines and a National Gas Transmission plc gas pipeline.

- 17.6.5 The National Gas Transmission plc gas pipeline is understood to cross an existing road within the Triton Knoll access track. As discussed in **Chapter 9 Access and Traffic, Section 9.4, (Document Ref: 6.2 ES Vol.1, 6.2.9)**, this track is to be used for access to the cable route and no excavation works are anticipated in this area.
- 17.6.6 For works taking place near utilities, avoidance measures such as mapping the infrastructure through ground-penetrating radar (GPR) and electromagnetic locators will be deployed. Standard working requirements will be agreed with the utility providers regarding safety clearances and best practice guidance, such as (but not limited to) 'HSE Guidance Note GS6 Avoidance of Danger from Overhead Electric Lines' and 'HSE Guidance Note G47 Avoiding Danger from Underground Services' will be adhered to throughout the construction and decommissioning phases, as outlined in the respective **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**.
- 17.6.7 Continual liaison with the utility providers regarding their assets and proposed activities will reduce the likelihood of effects on utilities. Engagement is also taking place to agree protective provisions to be included in the DCO. Therefore, significant effects in relation to utilities are not considered likely during the construction or decommissioning of the Proposed Development.
- 17.6.8 The decommissioning phase would require below ground works to remove the onsite infrastructure, but the underground cabling to the National Grid Bicker Fen Substation will remain *in situ*. In addition, significant effects on utilities are not considered likely as a result of the operational phase of the Proposed Development because there are no belowground works required during operation.

### Telecommunications

- 17.6.9 Data provided from Openreach confirmed that areas of the Site are traversed by BT telecommunications assets. There are no telephone masts present within the Site. Where works are proposed in proximity to telecommunications assets, further engagement will be undertaken prior to commencement to establish safe working procedures and acceptable distances to avoid and protect the assets during construction and decommissioning. The works will be subject to detailed risk assessment and undertaken in line with the measures set out in **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**. Therefore significant effects are not considered to be likely in relation to telecommunications.

### Television Reception

- 17.6.10 The Site and surrounding area are served by the Belmont transmitter, located approximately 34.5 km north east of the Proposed Development. Owing to the fixed and low-lying nature of the Proposed Development, it is considered unlikely it would interfere with digital television signals and therefore significant effects are not considered to be likely in the construction, operation and decommissioning phases.

## 17.7 Human Health

### Introduction

17.7.1 A health screening exercise was undertaken to inform the Scoping assessment in accordance with the Central Lincolnshire Healthy Planning Checklist, which concluded that the Proposed Development is only anticipated to potentially result in limited impacts on human health during construction and decommissioning. Potential effects of the Proposed Development of relevance to human health have been assessed throughout the ES within the following chapters:

- **Chapter 9 Access and Traffic (Document Ref: 6.2 ES Vol.1, 6.2.9);**
- **Chapter 10 Noise and Vibration (Document Ref: 6.2 ES Vol.1, 6.2.10);**
- **Chapter 11 Water Resources and Flood Risk (Document Ref: 6.2 ES Vol.1, 6.2.11);**
- **Chapter 13 Climate Change (Document Ref: 6.2 ES Vol.1, 6.2.13);**
- **Chapter 15 Socio Economics (Document Ref: 6.2 ES Vol.1, 6.2.15); and**
- **Chapter 16 Air Quality (Document Ref: 6.2 ES Vol.1, 6.2.16).**

17.7.2 Following the consideration of potential impacts in relation to human health, **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.2)** agreed that Human Health can be scoped out of the ES provided adequate signposting between aspect chapters is included. A summary of the relevant chapters in relation to human health is presented below.

### Summary

#### Chapter 9 Access and Traffic

17.7.3 The increase of traffic as a result of the Proposed Development, particularly during the construction and decommissioning phases, could potentially cause disruption to nearby residential and social receptors. This has been mitigated via the embedded mitigation measures discussed in detail within **Chapter 9 Access and Traffic (Document Ref: 6.2 ES Vol.1, 6.2.9)** of this Environmental Statement, and includes the following:

- *Suitable Routing and Timing of Construction Traffic* - Principal construction will access the Site from the A17 (left-in/left-out arrangement) via the Bespoke Access Road. All construction traffic will be subject to a detailed Construction Traffic Management Plan (CTMP)<sup>4</sup> and Delivery Management Plan (DMP) to safely manage construction traffic and ensure that highway safety and the free flow of traffic on public highway is maintained.
- *Encouraging Sustainable Travel* - A Construction Staff Travel Plan (TP)<sup>5</sup> will be implemented to minimise the impacts of construction staff travel

<sup>4</sup> At this stage, **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)** has been prepared. A detailed CTMP will be submitted for agreement by Lincolnshire County Council, Boston Borough Council and North Kesteven District Council before the commencement of the Proposed Development.

<sup>5</sup> At this stage, an **Outline Construction Staff Travel Plan** has been included as part of **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)** and is also to be agreed by Lincolnshire County Council, Boston Borough Council and North Kesteven District Council before the commencement of the Proposed Development.



to/ from the Site and the resultant impact on existing road users. Sustainable travel is to be achieved through a provision of minibuses from local pick-up points for construction workers to maximise the use of shared transport.

- *Site Access and Internal Access Roads* - To minimise impacts on local roads, principal construction access to the Site will be from the A17 via the Bespoke Access Road, and principal construction access to compounds 5 and 6 and the Bicker Fen NG Substation will be via the A17 and the private Triton Knoll access road. As per **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)**, Heavy Goods Vehicle (HGV) movements and abnormal loads will be restricted to the proposed access routes and, in the event of an A17 closure, managed accordingly to avoid diversion through Heckington. **Appendix 9.1 Transport Assessment (Document Ref: 6.3 ES Vol.2, 6.3.76)** has been prepared and demonstrates that suitable points of access for construction vehicles to accommodate swept paths and designed with adequate visibility are proposed, with any supporting improvements to take place within the highway boundary and/ or the Order Limits if required.
- *Abnormal Indivisible Loads (AIL)*<sup>6</sup> - The Bespoke Access Road provides embedded mitigation in respect of the two types of abnormal loads to access the Solar Array Area, which include flatbed HGVs (circa 80 tonne gross weight) and transformers transported by girder frame vehicles (circa 240 tonnes total gross weight). The AILs are to be addressed in detail within the detailed Construction Traffic Management Plan (CEMP) that is to be based upon **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)**. The detailed CEMP will set out traffic management and mitigation measures required to ensure safe and efficient transport of these loads.
- *Monitoring and Communication* - The detailed Construction Traffic Management Plan (CEMP) that is to be based upon **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)** will include a monitoring system to record the route of all HGVs travelling to/ from the Site to record any non-compliance with the agreed routing plan/ delivery hours and to communicate any issues to the relevant suppliers to ensure the correct routes and times are followed. A dedicated point of contact for traffic issues will be appointed by the contractor as part of the detailed CTMP.
- *Road Condition Surveys* - The detailed Construction Traffic Management Plan (CEMP) that is to be based upon **Appendix 9.3 Outline Construction Traffic Management Plan (OCTMP) (Document Ref: 6.3 ES Vol. 2, 6.3.78)** will provide for the local authorities and contractor to take part in road condition surveys pre-construction, and post-construction, to identify any defects that

<sup>6</sup> All abnormal load movements are regulated by National Highways and will be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system.

arise to the highway's assets/ verges during the construction phase of the Proposed Development for re-instatement.

- 17.7.4 As outlined in **Chapter 9 Access and Traffic (Document Ref: 6.2 ES Vol.1, 6.2.9)**, there would be **no significant residual effects** from the limited and temporary nature of the traffic increase.

### Chapter 10 Noise and Vibration

- 17.7.5 **Chapter 10 Noise & Vibration (Document Ref: 6.2 ES Vol.1, 6.2.10)** assesses the potential effects upon sensitive receptors as a result of changes in noise and vibration levels due to the Proposed Development during the construction, operational and decommissioning phases.
- 17.7.6 Onsite activities associated with both the construction and decommissioning phases of the Proposed Development have the potential to generate short-term increases in noise levels above those recommended in BS 5228-1:2009+A1:2014. Noise generated by the earthworks and construction and decommissioning phases of the Proposed Development may have a short-term, adverse effect at some Existing Sensitive Receptor (ESR) locations, but these are **Not Significant** since the activities would be transient.
- 17.7.7 In terms of vibration, it was assessed that vibration will be perceptible in residential environments during vibratory compaction activities, but the magnitude of impact will be low due to the distance of ESRs to the Proposed Development and the short duration of impacts as the works progress through the Site. Therefore, it is considered that the effect of vibration during construction would be **minor adverse** and **Not Significant**.
- 17.7.8 Given that both potential noise and vibration impacts have been assessed to be **Not Significant**, no secondary mitigation is required during the construction and decommissioning phases. To manage and minimise potential impacts, mitigation measures in the form of best practicable means (BPM) are suggested and implemented through **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**, with works to follow the guidelines in BS 5228.
- 17.7.9 During operation, for the daylight period (04:00-22:00), the worst-case magnitude of change is assessed to be medium and the level of impact is assessed as **moderate adverse**. Whilst 'potentially Significant', the effect is considered to be **Not Significant** as the sound level with a partially open window is unlikely to exceed recommended internal ambient sound levels in accordance with BS 8233; the assessment outcome is LOAEL<sup>7</sup> when considering planning policy. During operation, for periods of darkness (22:00-04:00), the worst-case magnitude of change is medium and the level of impact is **Moderate**. Whilst also 'potentially Significant', the effect is considered to be **Not Significant** as the sound level with a partially open window is unlikely to exceed recommended internal ambient sound levels in accordance with BS 8233; the assessment outcome is LOAEL when considering planning policy.

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<sup>7</sup> Lowest Observed Adverse Effect Level.

## Chapter 11 Water Resources and Flood Risk

- 17.7.10 **Chapter 11 Water Resources (Document Ref: 6.2 ES Vol.1, 6.2.11)** assesses the likely significant effects of the Proposed Development on Water Resources and Flood Risk, considering the potential for likely significant effects of changes to water quality and the hydrological regime. Potential effects on the water environment are those that may change the hydrological and hydrogeological flow regime, and those which may cause pollution and a degradation in water quality.
- 17.7.11 The magnitude of change from the baseline condition caused by the construction, operational and subsequent decommissioning phase activities has been assessed as negligible or low for all activities. The potential change to the water environment is likely to be small or slight with the use of SuDS and the implementation of measures such as pollution incident response plans and sediment runoff containment and treatment. No effect arising from the construction, operational or subsequent decommissioning phases was found to be greater than minor adverse, which is assessed as **Not Significant**.
- 17.7.12 The assessment concluded that with appropriate mitigation (secured via **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**), the scale of potential effects on the water environment were no greater than minor adverse and, as such, **Not Significant** and, therefore, **Not Significant** for human health.

## Chapter 12 Climate Change

- 17.7.13 **Chapter 12 Climate Change (Document Ref: 6.2 ES Vol.1, 6.2.12)** assesses the resilience of the Proposed Development to climate change based on the susceptibility and vulnerability of a range on different receptors. Human health receptors include construction workers, occupants and site users. Potential risks and climate change threats could result in increased energy demands, economic losses, and losses of life.
- 17.7.14 The impact of the proposed changes to climatic factors for the construction phase is determined to be of very low likelihood and therefore Negligible. This specifically relates to the impact of climatic effects on construction workers; the only receptor existing solely within the construction phase. Therefore, potential climate related effects for human health during construction are assessed to be **Not Significant**.
- 17.7.1 During operation, the residual effects of the Proposed Development compared to the generating technology it is most intended to replace, are considered. Whilst the emissions from the BESS increase the overall emissions from the Proposed Development, it would also allow the Proposed Development (as a whole) to offset much higher carbon generating assets. An emission saving of 8,330,640 tCO<sub>2</sub>e is predicted, when the renewable electricity generation is compared with a natural gas equivalent, which is considered to be a **Significant beneficial effect**.
- 17.7.2 During decommissioning, activities associated with this phase will likely mirror those during the construction phase, but the climate may have altered during the intervening period. Whilst weather during the decommissioning phase may

be more erratic and volatile than during construction, the process will be short and temporary and, provided suitable planning is made to ensure site safety during this time, there are not expected to be any excessive risks. The overall magnitude of the climatic impacts on receptors within the decommissioning phase is **negligible** and the effect would be **Not Significant**. In terms of climate change resilience during operation, the levels of effect are no more than **minor adverse** and, as such, **Not Significant**.

- 17.7.3 In addition, the implementation of solar power reduces the exploitation of fossil fuel (coal and natural gas) by generating electricity from a renewable source. This development offsets the emissions associated with non-renewable methods of electricity generation and therefore mitigates the impact of climate change to human health.

### Chapter 15 Socio-Economic

- 17.7.4 **Chapter 15 Socio-Economic (Document Ref: 6.2 ES Vol.1, 6.2.15)** has assessed the potential impacts of the Proposed Development on the social and economic environment, taking into account any likely effects on local communities, employment, housing and infrastructure.
- 17.7.5 Section 15.6 of **Chapter 15 Socio-Economic (Document Ref: 6.2 ES Vol.1, 6.2.15)** considers the effects of noise on human health, with paragraph 15.6.24 acknowledging that the World Health Organisation (WHO) recognises 'noise' to be a potentially harmful environmental stressor upon human health. Within **Chapter 10 Noise and Vibration (Document Ref: 6.2 ES Vol.1, 6.2.10)** the potential for significant effects on existing sensitive receptors during construction, operation and decommissioning is assessed. With mitigation measures in place, the residual effects during the construction and decommissioning phases assessed as **Not Significant**. The socio-economic impact from noise on human health and well-being during the construction and decommissioning phases is considered to be **minor adverse** and **Not Significant**.
- 17.7.6 During the (40-year) operation of the Proposed Development, there is the potential for a moderate effect for residential receptors located near to the Solar Array Area, but with the embedded mitigation measures discussed within **Chapter 10 Noise and Vibration (Document Ref: 6.2 ES Vol.1, 6.2.10)** in place, the effect is considered to be **Not Significant**. The socio-economic impact from noise on human health and well-being during the operational phase is considered to be up to **minor adverse** and **Not Significant**.
- 17.7.7 The connection between human health and wellbeing with recreation in the outdoors is well established. **Chapter 15 Socio-Economic (Document Ref: 6.2 ES Vol.1, 6.2.15)** has assessed the impacts of restricted access to recreation such as public rights of way (PROW) and cycle routes as **Not Significant**.
- 17.7.8 The potential socio-economic effects of the Proposed Development in terms of human health are assessed to be minor and **Not Significant**, with no adverse impacts on human health or wellbeing.

### Chapter 16 Air Quality

- 17.7.9 **Chapter 16 Air Quality (Document Ref 6.2 ES Vol.1, 6.2.16)** considered potential impacts on human receptors from construction and decommissioning activities, the operational phase, traffic emissions and dust generation. The closest Air Quality Management Area (AQMA) is located approximately 17km east of the Site; the Site is not located in or near to a known area of concern for air quality in relation to human health.
- 17.7.10 Human health risk is considered low for the earthworks, construction and decommissioning, and trackout activities. However, as some activities present a risk above negligible, site-specific mitigation measures will be implemented through **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**. During construction and decommissioning, the risk of dust soiling is low to medium and human health risks are low. Therefore, site-specific mitigation measures implemented via a Dust Mitigation Plan (DMP) as part of **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)** will reduce all dust and particulate impacts to a level which is **Not Significant**.
- 17.7.11 Traffic emissions during the considered phases are well below IAQM thresholds for detailed assessment under the IAQM/EPUK guidance and **no significant impacts** are anticipated. The residual impacts of the Proposed Development on human receptors during the construction and decommissioning phases are considered to be direct, temporary, medium-term and **Not Significant**. During the operational phase, the residual impacts of the Proposed Development on human receptors are considered to be direct, permanent, long-term and **Not Significant**.
- 17.7.12 Overall, effective mitigation measures ensure that the Proposed Development will result in **no significant air quality effects** on human receptors.

## Conclusion

- 17.7.13 As per **Appendix 1.2 Scoping Opinion in (Document Ref: 6.3 ES Vol.2. 6.3.2)**, given that **no significant effects** in relation to human health are considered likely to occur, it was not considered proportionate to include a standalone chapter for this topic within this Environmental ~~Statement~~Statement. Mitigation measures will be implemented (where required) to avoid the potential for adverse impacts relating to human health determinants.

## 17.8 Electromagnetic Fields (~~EMF~~EMFs)

### Introduction

- 17.8.1 ~~In~~This section considers the potential effects to receptors of EMFs produced by the Proposed Development.
- 17.8.2 Current Government policy is that power lines should comply with the 1998 International Commission on Non-Ionizing Radiation Protection (ICNIRP)



Guidelines<sup>8</sup> in line with relevant guidance (the terms of the 1999 EU Council recommendation on limiting public exposure to EMFs.

17.8.3 The Department of Energy and Climate Change (DECC) published 'Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice' in 2012), cables above 132kV have potential to cause electro-magnetic field effects. PINS considered that, setting out how compliance with the ESp public exposure guidelines should set out the design measures to be implemented to avoid the potential for likely significant effects of EMF on receptors, in line with evidenced. DECC's Voluntary Code of Practice 2012, requires a calculation or measurement of the maximum field directly above a cable, if the voltage of the cable exceeds 132kV.

17.8.4 There is no direct statutory provision in the planning system relating to protection from EMFs.

17.8.5 However, paragraph 2.10.11 of the National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security and Net Zero, 2023) states that an applicant should consider:

- 'height, position, insulation and protection (electrical or mechanical as appropriate) measures subject to ensuring compliance with the Electricity Safety, Quality and Continuity Regulations 2002;
- that optimal phasing of high voltage overhead power lines is introduced wherever possible and practicable in accordance with the Code of Practice to minimise EMFs; and
- any new advice emerging from the Department of Health and Social Care relating to government policy for EMF exposure guidelines.'

17.8.6 EN-5 also states at paragraph 2.10.12 that where it can be shown that the line will comply with the current public exposure guidelines, no further mitigation should be necessary.

17.8.7 Table 17.4 provides a summary of the consultation and engagement relevant to EMFs and how this has been addressed.

**Table 17.4 EMF related consultation**

<b><u>ORGANISATION</u></b>	<b><u>DATE</u></b>	<b><u>FORM OF CONSULTATION</u></b>	<b><u>SUMMARY OF OUTCOME</u></b>
<b><u>EIA Scoping</u></b>			
<u>Planning Inspectorate (PINS)</u>	<u>26/05/2023</u>	<u>Scoping Opinion</u>	<u>At the time of Scoping, the potential for overhead cables was still being considered. As such PINS requested that the ES should 'address the risks to human health arising from EMF to the extent that it is relevant to the nature of the development, taking into account relevant technical guidance, and where significant effects are likely to occur'. This chapter confirms, with reference to</u>

<sup>8</sup> Guidelines For Limiting Exposure To Time-Varying Electric, Magnetic And Electromagnetic Fields (up to 300 GHz). International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998). Online at: ICNIRPemfgdl.pdf (<https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf>).

<u>ORGANISATION</u>	<u>DATE</u>	<u>FORM OF CONSULTATION</u>	<u>SUMMARY OF OUTCOME</u>
			relevant technical guidance, that significant effects are not likely to occur.  PINS also requested that the ES should set out the design measures to be implemented to avoid the potential for likely significant effects in line with DECC's Voluntary Code of Practice 2012. This is set out within this chapter.
<b><u>Section 42</u></b>			
<u>UK Health Security Agency (UKHSA)</u>	<u>28/02/2024</u>	<u>Section 42 consultation response</u>	UKHSA advised that according to the DECC's voluntary Code of Practice, if the cable exceeds 132 kV, a calculation or measurement of the maximum fields directly above the cable is required to demonstrate compliance with ICNIRP exposure guidelines. This was considered within this chapter, with reference to relevant sources (including National Grid's website 'emfs.info').
<b><u>Pre-Examination</u></b>			
<u>UK Health Security Agency</u>	<u>26/06/2025</u>	<u>Relevant Representation</u>	UKHSA responding that they did not consider that the submitted ES provided a detailed EMF assessment. This chapter has been updated to provide further detail on EMF and a measurement of the maximum field directly above the cable.

17.8.8 The following section sets out the design measures which will be implemented to avoid likely significant effects of EMFs on receptors and provides an assessment of EMF effects associated with the Proposed Development.

## **Technical Background**

17.8.9 EMFs are produced by anything which uses or transmits electricity. Electrical appliances and wiring that is normally used in houses generate a magnetic field, so background magnetic fields are present in most homes. The magnetic field level in a house in the UK will typically be between 0.01 to 0.2 microtesla (µT).

17.8.10 The WHO has provided data on the typical magnetic field strength of household appliances at various distances, as summarised below in Table 17.5.

**Table 17.5 Typical magnetic field strength of household appliances at various distances<sup>9</sup>**

<b>ELECTRIC APPLIANCE</b>	<b>3 CM DISTANCE (μT)</b>	<b>30 cm distance (μT)</b>	<b>1 m distance (μT)</b>
Hair dryer	6 – 2000	0.01 – 7	0.01 – 0.03
Electric shaver	15 – 1500	0.08 – 9	0.01 – 0.03
Vacuum cleaner	200 – 800	2 – 20	0.13 – 2
Microwave oven	73 – 200	4 – 8	0.25 – 0.6
Electric oven	1 – 50	0.15 – 0.5	0.01 – 0.04
Washing machine	0.8 – 50	0.15 – 3	0.01 – 0.15
Dishwasher	3.5 – 20	0.6 – 3	0.07 – 0.3
Refrigerator	0.5 – 1.7	0.01 – 0.25	<0.01
Colour TV	2.5 – 50	0.04 – 2	0.01 – 0.15

17.8.11 At high levels, EMFs can cause induced currents to flow in the body, which if high enough can interfere with the nervous system. The UK Government set exposure guidelines at a national level for EMFs based on the ICNIRP Guidelines. The limits are designed to prevent all established effects of EMFs on the body.

17.8.12 As stated at paragraphs 2.9.56 – 2.9.58 of NPS EN-5:

- the balance of scientific evidence over several decades of research has not proven a causal link between EMFs and cancer or any other disease;
- the Department of Health and Social Care's Medicines and Healthcare Products Regulatory Agency does not consider that transmission line EMFs constitute a significant hazard to the operation of pacemakers; and
- there is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences.

## **Design Measures**

~~17.8.1~~17.8.13 At the time of submission of **Appendix 1.1 Scoping Report (Document Ref: 6.3 ES Vol.2, 6.3.1)**, both overhead and underground cabling was being considered, but ~~across the subsequent design stages, overhead cabling has been ruled out and underground cabling adopted. Positioning cabling underground minimises the potential effects of EMF—since underground cables generally have a negligible electric field with less radiation compared to overhead lines because emissions from adjacent conductors within a cable tend to cancel each other out. In addition, EMFs since~~ electrical fields from the underground power cables will be shielded by the surrounding cable duct and the conducting soil. ~~Thus, whilst~~Whilst magnetic fields from underground cables still exist, they decrease more rapidly with distance compared to fields from overhead cables.

~~17.8.2 The cable routes will not be powered during construction, or at least not be operating at full capacity and, therefore, the effects of EMFs from the cable~~

<sup>9</sup> Radiation: Electromagnetic fields, WHO <https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields> Accessed 05/08/2025

~~routes during construction will be less than or equal to the effects during operational phase, which represents a worst case scenario. In line with the National Policy Statement for Electricity Networks Infrastructure (EN-5) (Department for Energy Security & Net Zero, 2023), the electrical infrastructure will be designed to comply with current guidelines on levels of EMF exposure.~~

~~17.8.3 National Grid states that the typical magnetic field for an underground 400kV cable is 25 microteslas ( $\mu\text{T}$ ) at the centre line of the cable<sup>10</sup>. Magnetic fields from underground cables fall rapidly with distance from the cable, reducing to negligible levels ( $<1 \mu\text{T}$ ) at 20m from the centreline of the cable. As the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines<sup>11</sup> stated public exposure limit of 100  $\mu\text{T}$  would not be exceeded directly above the cable, it is considered that any EMF effects in terms of the underground cabling are not likely to be significant.~~

**17.8.14** Following consultation and engagement, and evolving design, several options were identified for potential cable route connection corridors, via site walkovers and surveys. Option 1 was considered to be the most direct route and is the most appropriate in terms of distances from properties, avoiding main settlements, as shown in **Appendix 3.1 Cable Route Connection Corridor Appraisal (Document Ref: 6.3 ES Vol.2, 6.3.9)**.

**17.8.15** Although the exact position of the Cable Route will be confirmed during detailed design, the closest residential receptor to the Cable Route Corridor is located approximately 20m from the Order Limits.

**17.8.16** The final alignment and detailed design of the Cable Route will be compliant with the Electricity Safety, Quality and Continuity Regulations 2002 and any new advice emerging from the Department of Health and Social Care relating to government policy for EMF exposure guidelines.

**17.8.17** The Cable Route Corridor predominantly comprises private land with no public access, however it does cross a number of highways, Public Rights of Way and a railway.

**17.8.18** The positioning of ancillary infrastructure within the Solar Array Area, such as for the locations of inverters, transformers and other sources of EMF/EMFs, have also been considered so they are at safe distances from sensitive receptors, considering the most advanced technology. These design choices are presented within **Chapter 3 Alternatives and Design Evolution (Document Ref: 6.2 ES Vol.1, 6.2.3)**. The closest residential property is located at least 700m from the BESS and Substation area. ~~Due to the distance, it is considered that EMF field strength will fall below the ICNIRP reference level at all residential receptors.~~

## **EMF Assessment**

### **Scope of Assessment**

<sup>10</sup> <https://www.emfs.info/electricity-system-and-sources/cables/transmission> (accessed March 2025)

<sup>11</sup> Guidelines For Limiting Exposure To Time-Varying Electric, Magnetic And Electromagnetic Fields (up to 300 GHz), International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998). Online at: [ICNIRPemfgdl.pdf \(https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf\)](https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf).

17.8.19 National Grid states that the electric fields from underground cables are contained within the cable's protective insulation and sheath, so there are no external electric fields<sup>12</sup>. Therefore, electric fields are not considered further in this assessment.

17.8.20 The Cable Route will not be powered during construction, or at least not be operating at full capacity and, therefore, the effects of EMFs from the Cable Route during construction will be less than or equal to the effects during operational phase, which represents a worst-case scenario. During the decommissioning phase, the Cable Route will be disconnected from the electricity network and remain in situ underground. As such, the assessment has considered the operational phase only.

### **Assessment of Maximum Field**

17.8.21 The ICNIRP guidelines sets out reference levels, as measurable values against which EMF exposure can be considered. The ICNIRP reference levels for magnetic fields are 100  $\mu$ T for the public. The occupational limits are five times higher at 500  $\mu$ T. These reference levels are not limits, but are values that should trigger further investigation into compliance with the exposure guidelines.

17.8.22 If the maximum field above the cable is less than the ICNIRP guideline levels, it can be assumed that all fields and exposures from that source will be compliant.

17.8.23 As set out in **Appendix 2.1: Grid Connection Construction Method Statement (Document Ref: 6.3 ES Vol 2, 6.3.4)** the Cable Route will be underground, either laid in trenches of up to 2.5m depth, with 1m to 1.25m of cover to the top of the cable duct or by using trenchless techniques, such as auger boring, HDD or micro-tunnelling. Trenchless techniques will be undertaken where environmental assessment has determined that mitigation for an environmental impact is required or design constraints conclude the need for an alternative to open trenching. In these locations, the cable will be buried up to a maximum depth of 25m.

17.8.24 National Grid guidance<sup>13</sup> provides information regarding magnetic fields for buried cables, at various distances from the centreline, as reproduced in Table 17.6 below.

**Table 17.6 Magnetic field for a 400kV cable in  $\mu$ T at distance from centreline**

		<b>0m</b>	<b>5m</b>	<b>10m</b>	<b>20m</b>
<u>Trough</u> <u>0.13m spacing; 0.3m depth</u>	<u>Max</u>	<u>83</u>	<u>7</u>	<u>1.8</u>	<u>0.5</u>
	<u>Typical</u>	<u>21</u>	<u>2</u>	<u>0.5</u>	<u>0.1</u>
<u>Direct Buried</u> <u>0.5m spacing; 0.9m depth</u>	<u>Max</u>	<u>96</u>	<u>13</u>	<u>3.6</u>	<u>0.9</u>
	<u>Typical</u>	<u>24</u>	<u>3</u>	<u>0.9</u>	<u>0.2</u>
<u>Deep bore tunnel</u> <u>25m depth</u>	<u>Max</u>	<u>0.11</u>	<u>0.10</u>	<u>0.09</u>	<u>0.05</u>
	<u>Typical</u>	<u>0.03</u>	<u>0.03</u>	<u>0.02</u>	<u>0.01</u>

<sup>12</sup> <https://www.emfs.info/electricity-system-and-sources/cables> (accessed July 2025)

<sup>13</sup> Undergrounding high voltage electricity transmission lines: The technical issues. National Grid (January 2015)



17.8.25 As illustrated within Table 17.6, the maximum field directly above the cable would be 96  $\mu$ T. Therefore, the magnetic field will not exceed 100  $\mu$ T and the reference levels for public or occupational exposure will not be breached.

17.8.26 As set out at paragraph 17.8.15, the closest residential receptor to the Cable Route Corridor is located approximately 20m from the Order Limits. As such it can be concluded that the maximum magnetic field at this property would not exceed 0.9  $\mu$ T.

## Conclusion

17.8.27 The Site is considered to present an overall low risk of potential EMF effects. This is attributed to embedded mitigation Measures have been incorporated within the Site design, evolution of the layout and choice for underground cabling. Any potential EMF risks at the Site, and near to the Site are considered to be adequately addressed in-line Proposed Development to minimise potential EMF effects.

17.8.28 In accordance with DECC's Voluntary Code of Practice 2012—, as the maximum value is less than the ICNIRP guideline levels, it may be assumed that all fields and exposures from that source will be compliant.

~~17.8.6~~17.8.29 Therefore, as per **Appendix 1.2 Scoping Opinion (Document Ref: 6.3 ES Vol.2, 6.3.2)** given that ~~no~~ it is considered that the Proposed Development will not result in significant effects in relation to ~~EMF~~ are considered likely to occur, it was not considered proportionate to include a standalone chapter for this topic within this ESEMF.

## 17.9 Health and Safety Executive (HSE)

### Introduction

- 17.9.1 Consultation with HSE indicated that the Proposed Development is within the consultation zone of a Major Accident Hazard Pipeline (MAHP). This is identified as National Grid Gas plc's '7 Feeder Hatton/ Gosberton', HSE reference number 6910 (Transco ref. 1185). The MAHP intersects with the Site in one location along the Triton Knoll access track (the access track from the A17 to the South Forty Foot Drain), which was used to facilitate the construction of the Triton Knoll Onshore Substation.
- 17.9.2 As discussed within **Appendix 9.1 Transport Assessment (Document Ref: 6.3 ES Vol.2, 6.3.76)**, the Triton Knoll access road passes over the pipeline and construction traffic accessing compounds 5 and 6 and Bicker Fen National Grid Substation will cross the MAHP. The worst-case estimate of daily traffic crossing this route, assuming works at both compounds and the National Grid Substation is undertaken simultaneously, comprises 32 HGV movements and 10 staff minibus movements. This is likely to be less than the maximum daily flows during the Triton Knoll substation project for which the access road was designed.
- 17.9.3 A small number of movements will be abnormal loads for the delivery of cable drums to the Cable Route compounds. The total gross weight of these loads is 78 tonnes, but the load per axle line of the cable drum vehicles is less than 11 tonnes and materially different to a conventional 44 tonne HGV. It is,

therefore, likely that the Triton Knoll access road is of sufficient construction to convey these loads safely across the pipeline. Due diligence will be undertaken by the Cable Route contractor to ensure conveyance methods for all equipment and materials are suitable for the present condition of the road.

- 17.9.4 Apart from this one location where the MAHP crosses the access track, the MAHP runs parallel to (and outside of) the Site with distance increasing from the point of intersection before it passes to the east of the Solar Array Area. At the closest point, the MAHP is located 3.3km east of the Solar Array Area.
- 17.9.5 Consultation Zones are determined by a detailed assessment of the risks and/or hazards of the installation or pipeline which takes into account the following factors:
- The quantity of hazardous substances for which the Site has hazardous substances consent and details of the storage and/ or processing; and
  - Hazard ranges and consequences of major accidents involving the toxic and/ or flammable and/ or other hazardous substances that could be present.
- 17.9.6 The risks and hazards from the major hazard are greatest in the Inner Consultation Zone, with risk reducing with distance across the Middle and Outer Zones.

## Mitigation

- 17.9.7 All work conducted within the consultation zone of the MAHP will be carried out in compliance with applicable legislation and regulatory requirements. This includes:
- Pipelines Safety Regulations 1996, which set out the legal framework for the design, construction, operation and maintenance of pipelines to ensure safety;
  - Control of Major Accident Hazards (COMAH) Regulations 2015, which require the identification and mitigation of risks associated with hazardous substances; and
  - Health and Safety at Work etc. Act 1974, which places a duty on employers to ensure the health, safety, and welfare of employees and others who may be affected by the work.
- 17.9.8 Compliance with this legislation ensures that risks associated with hazardous pipelines are properly assessed and managed, incorporating best practices for safety, environmental protection, and emergency preparedness during each phase of the Proposed Development.
- 17.9.9 As per **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3 ES Vol.2, 6.3.7)** and **Appendix 2.5 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3 ES Vol.2, 6.3.8)**, both:
- Emergency procedures would be established through consultation with the pipeline operator, HSE and relevant authorities; and
  - Prior to commencement of construction and the decommissioning phase, the Principal Contractor(s) would liaise with HSE to ensure that traffic

routes do not encroach within a defined proximity of the identified asset, and any further mitigation measures are agreed.

## Summary

17.9.10 Whilst it is acknowledged that the Site intersects with the MAHP, as mentioned above, major hazards or accidents are not anticipated from the Proposed Development being located within the consultation zone of a MAHP. During construction, operation and decommissioning, statutory legislation will be followed to ensure people and property are protected from any potential major hazards or accidents. Throughout the process, all necessary consultations with the HSE and relevant authorities will be undertaken to ensure full regulatory compliance and risk mitigation.

# BFEP Appendices