



# Longfield Solar Farm

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## 16. Other Environmental Topics

### 16.1 Introduction

- 16.1.1 The purpose of this Environmental Statement (ES) chapter is to collate the assessment of other environmental topics that do not warrant individual chapters, either due to the brevity of the assessment or the small impact associated with the Scheme.
- 16.1.2 This chapter describes and assesses the potential effects of the Scheme on:
- Glint and Glare (Section 16.2);
  - Ground Conditions (Section 16.3);
  - Major Accidents or Disasters (Section 16.4);
  - Telecommunications, Television Reception and Utilities (Section 16.5);
  - Waste (Section 16.6).
- 16.1.3 Where relevant, the legislation and guidance, baseline conditions, assessment methodology, and mitigation measures are outlined in the following sections for each topic.
- 16.1.4 This chapter is supported by the following technical appendices provided in Volume 2 of this ES [EN010118/APP/6.2]:
- Appendix 10G: Glint and Glare Assessment;
  - Appendix 16A: Phase 1 Preliminary Risk Assessment;
  - Appendix 16B: BESS Plume Assessment
- 16.1.5 This chapter is also supported by the following technical documents:
- Outline Construction Environmental Management Plan (OCEMP) [EN010118/APP/7.10]
  - Outline Operational Environmental Management Plan (OOEMP) [EN010118/APP/7.11]
  - Decommissioning Strategy [EN010118/APP/7.12]; and
  - Outline Landscape and Ecological Management Plan (OLEMP) [EN010118/APP/7.13].
- 16.1.6 Abbreviations and capitalised terms are defined in the Glossary, **Chapter 0** of the ES.
- 16.1.7 For each topic the engagement with the Host Authorities (Essex County Council, Braintree District Council, and Chelmsford City Council) is set out within the Consultation Report.

### **Concept Design Parameters, Design principles, and the Rochdale Envelope**

- 16.1.8 As discussed in **Chapter 2: The Scheme** of the ES, a Rochdale Envelope approach is being used to provide flexibility in the ES and the Development

Consent Order (DCO), to allow for the most up to date technology possible to be utilised by the Scheme at the time of construction.

16.1.9 A number of elements of detailed design for the Scheme cannot be confirmed until the tendering process for the design and construction of the Scheme has been completed. For example, due to the rapid pace of technological development in the solar photovoltaic (PV) and energy storage industry, the Scheme could utilise technology which does not currently exist and therefore sufficient flexibility needs to be incorporated into the Application.

16.1.10 To address this, a 'Rochdale Envelope' approach is used. This involves assessing the maximum (and where relevant, the minimum) parameters for the Scheme where flexibility needs to be retained. The principles and justification for this approach are set out in **Chapter 5: Environmental Impact Assessment Methodology** of this ES.

16.1.11 The peak construction years for the purpose of the EIA is anticipated to be no earlier than 2025; this assumes commencement of construction no earlier than Q1 2024 and that the Scheme is built out over a 24-month period. This is a likely 'worst case' for most environmental aspects because it compresses the onsite activity into a shorter duration and represents the greatest impact. Although the Battery Energy Storage System (BESS) may be built in two phases five years apart, this does not change the approach to, or impacts associated with any of the issues in this chapter, as the compressed construction represents the worst case scenario for potential impacts.

## 16.2 Glint and Glare

### *Introduction*

16.2.1 This section summarises the potential effects of the Scheme on glint and glare for surrounding receptors.

16.2.2 The definition of glint and glare can vary; however, the definition used within this assessment is as follows (Ref 16-1):

- a. 'Glint' refers to a momentary flash of bright light typically received by moving receptors or from moving reflectors.
- b. 'Glare' refers to a continuous source of bright light typically received by static receptors or from large reflective surfaces.

16.2.3 The full study on glint and glare, undertaken for the Scheme by Neo Environmental is available in **Appendix 10G** of the ES. The Glint and Glare Report assumes a PV Table angle of between 10 and 30 degrees from horizontal in a fixed tilt arrangement, with a maximum height of 3m across the Order limits. Further information on Scheme components including the PV Mounting Structures is presented in **Chapter 2: The Scheme** of the ES.

16.2.4 The glint and glare assessment has been based on the Concept Design so that a specific solar PV setup can be modelled. The narrower rows allowed by the Design Principles and extra solar PV panels if Phase 2 of the BESS and some BoSS / Solar Stations are not built would not affect the conclusions of the assessment. The conclusions of the glint and glare assessment therefore

remain valid for any scheme that could be constructed within the Design Principles.

### **Relevant Legislation, Guidelines and Policy**

#### **Planning Practice Guidance – Renewable and Low Carbon Energy**

16.2.5 UK national Planning Practice Guidance dictates that in some instances, a glint and glare assessment is required (Ref 16-69); however, there is no specific guidance with respect to the methodology for assessing the impact of glint and glare.

16.2.6 Paragraph 2.52 of the Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) states:

*“In some instances, it may be necessary to seek a glint and glare assessment as part of the application...The potential for solar PV panels, frames and supports to have a combined reflective quality should be assessed. This assessment needs to consider the likely reflective capacity of all of the materials used in the construction of the solar PV farm”.*

16.2.7 Planning Practice Guidance from the Ministry of Housing, Communities and Local Government (Ref 16-70) emphasises the need to consider the landscape effects as well as neighbouring uses and aircraft safety with regard to glint and glare assessments.

#### **Railway Assessment Guidelines**

16.2.8 Railway Assessment Guidelines on signal positioning and visibility (Ref 16-25) provides guidance with respect to the effects of solar glare on train drivers and railway signals. This guidance has been taken into account in the development of the methodology for the glint and glare assessment.

### **Consultation Responses**

16.2.9 Consultation undertaken to date in relation to glint and glare is outlined in the Consultation Report submitted with the application. **Table 16-1** outlines the matters raised within the Scoping Opinion and key themes raised during statutory consultation and how these have been addressed through the ES.

**Table 16-1: Consultation matters raised and responses for glint and glare**

<b>Consultee</b>	<b>Matter raised</b>	<b>Response</b>
Planning Inspectorate	The description of baseline conditions in Section 13.4 of the Scoping Report makes no mention of the Great Eastern Main Line (GEML) railway, which is located immediately adjacent to the southern boundary of the application site. Impacts to rail travellers, including train drivers, such as those associated with visual amenity and glint and glare, should be assessed where significant effects are likely to occur. Appropriate cross-referencing and explanation between relevant ES aspect chapters should be provided.	Railway lines are assessed within the glint and glare assessment and a Rail Receptor map included within that assessment.  The glint and glare assessment is included in <b>Appendix 10G</b> of the ES and a summary is presented in this section. The assessment includes

Consultee	Matter raised	Response
		impacts to sensitive receptors.
<p>Planning Inspectorate</p>	<p>The Applicant proposes to scope out a standalone ES aspect chapter for Glint and Glare, noting that impacts from glint and glare on landscape would be considered within the LVIA chapter of the ES. Section 14.7 of the Scoping Report (Major Accidents or Disasters) also refers to consideration of glint and glare. The results and recommendations of glint and glare calculations would be incorporated into the design of the Proposed Development and presented as a technical appendix to the ES. The Inspectorate is content that any significant effects that arise from glint and glare can be assessed within relevant aspect chapters of the ES and summarised within the 'Other Environmental Issues' chapter. A standalone chapter for Glint and Glare is not required. It should however be clear in the ES, with appropriate cross-referencing and explanation, how the findings presented in the glint and glare technical appendix have been integrated with relevant aspect assessments including Landscape and Visual Impact Assessment (LVIA), cultural heritage, transport and major accidents or disasters.</p>	<p>The results and recommendations of the glint and glare assessment in <b>Appendix 10G</b> of the ES have been incorporated into the Scheme design. Glint and glare effects have been mitigated where necessary through hoarding and/or planting, and incorporated within <b>Chapter 10: Landscape and Visual Amenity</b> of the ES [6.2].</p>
<p>Planning Inspectorate</p>	<p>Assessment of impacts from glint and glare during construction and decommissioning.</p> <p>Based on the nature of the activities, the distances to receptors and the use of a CEMP, the Applicant proposes to scope an assessment of impacts from glint and glare during construction and decommissioning out of the ES.</p> <p>The Inspectorate has considered the nature and characteristics of the Proposed Development and is content with this approach. An assessment of impacts from glint and glare during construction and decommissioning can be scoped out of the ES.</p>	<p>The glint and glare assessment for operational effects is included in <b>Appendix 10G</b> of the ES. A summary is presented in this section.</p> <p>An Outline CEMP has been prepared.</p> <p>Noted</p>
<p>Planning Inspectorate</p>	<p>The technical appendix to the ES must clearly explain the assessment methodology (with reference to appropriate modelling and predictive techniques, charts/diagrams and visual representations such as GIS based viewshed analyses) to indicate the likely extent and distance of potential glint and glare. Where professional judgement has been applied, this should be identified.</p>	<p>The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. The assessment methodology is included in Section 4 (Methodology) of the Glint and Glare assessment. A</p>

Consultee	Matter raised	Response
		summary is presented in this section.
Planning Inspectorate	The Applicant is advised to use the Zone of Theoretical Visibility (ZTV) developed for the LVIA to identify sensitive receptors with potential views of the site, which may therefore be affected by glint and glare. Effort should be made to agree the sensitive receptors with relevant consultation bodies. In addition to the receptors identified in Section 14.4 of the Scoping Report, the Applicant should also assess impacts to residential receptors, rail travellers on the GEML (including train drivers), aircraft (as indicated in Table 14-1 of the Scoping Report) and cultural heritage assets and their settings, where significant effects are likely. The locations of the sensitive receptors should be shown on an accompanying plan.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. A summary is presented in this section. Sensitive receptors have been informed by the production of ZTVs, and discussed and agreed with the Host Authorities.  Receptors have included residential receptors, rail travellers, aircraft, and cultural heritage assets.
Planning Inspectorate	Where flexibility remains regarding the location and orientation of the solar panels, the technical appendix to the ES should identify and assess the worst case applicable to the design of the Proposed Development and its impacts. The likely timing and duration of the impact should be noted. The assessment must cover the anticipated operational lifespan of the Proposed Development.	The glint and glare assessment identifies and assesses the worst case, and likely timings and duration of predicated impacts. The glint and glare assessment also covers the operational lifespan of the Scheme.
Chelmsford City Council	The relationship to Glint and Glare Assessment and residential amenity are also material to the consideration of the proposal.	Noted and has been considered within <b>Chapter 10: Landscape and Visual</b> of the ES [6.2].
Chelmsford City Council	Cross reference shall be made to the Glint and Glare Assessment to ensure that highway users are not materially affected by the proposal.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES and cross referenced in <b>Chapter 10 Landscape and Visual Amenity</b> , and <b>Chapter 13 Transport</b> .
Chelmsford City Council	The potential impact of glint and glare from the solar panels on landscape/visual amenity, aircraft, rail and road safety and residential amenity will be material to the consideration of the proposal.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. A summary is presented in this section.  Sensitive receptors have been informed by



Consultee	Matter raised	Response
		<p>the production of ZTVs, and discussed and agreed with the Host Authorities.</p> <p>Receptors have included residential receptors, rail travellers, aircraft, and cultural heritage assets.</p>
Chelmsford City Council	<p>Consideration needs to be given to the individual households sited next to and within the vicinity of the site and to the communities of Boreham and the Chelmsford Garden Community.</p>	<p>Noted. Sensitive receptors have been informed by the production of ZTVs, and discussed and agreed with the Host Authorities.</p> <p>Receptors have included residential receptors, rail travellers, aircraft, and cultural heritage assets.</p> <p>The glint and glare assessment is included in <b>Appendix 10G</b> of the ES.</p>
Chelmsford City Council	<p>The Glint and Glare Assessment should cross reference to other policy sections including Landscape and Visual Amenity and Transport and Access.</p>	<p>Noted. This is included in the glint and glare assessment included in <b>Appendix 10G</b> of the ES. Policy relating to Landscape and Visual Amenity, and Transport and Access is cross referenced in Section 3: Legislation and Policy, of the glint and glare assessment.</p>
Chelmsford City Council	<p>The effect of the proposal upon the quality of life and amenities of individual households, local residents and the communities of Boreham, the Chelmsford Garden Community and others in Braintree District will be material to the consideration of the application and will include amongst others...                      Glint and Glare</p>	<p>The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. The effects of glint and glare and their impact on local receptors has been analysed in detail within the assessment, and no significant effects have been identified. A summary of the assessment results is included in paragraph 8.6 of the glint and glare assessment. A</p>

Consultee	Matter raised	Response
Essex County Council	There will need to be cross-referencing to other technical assessments where any potential and/or significant effects are identified. For example, in relation to air quality, visual effects (including 'glint and glare') and any impact on heritage assets.	<p>summary is presented in this section.</p> <p>The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. A summary is presented in this section. No significant effects are predicted as a result of glint and glare from the Scheme.</p> <p>Significant effects identified by other technical assessments are cross referenced in <b>Chapter 17: Effect Interactions</b> of the ES.</p>
Essex County Council	ECC recommends consideration is given to the design, alignment and movement of the solar panels, as this will have potential implications on the impact of the proposal through 'glint and glare' on the existing communities, CNEB and Chelmsford Garden Community. This will impact on visual amenity to new and existing residents and potential road safety along the new bypass, and potentially A12.	<p>Details on panel design, location and orientation are presented in <b>Chapter 2: The Scheme</b> of the ES. There is no movement associated with the Solar PV Arrays.</p> <p>The results and recommendations of the glint and glare assessment in <b>Appendix 10G</b> of the ES have been incorporated into the Scheme design. Glint and glare effects have been mitigated where necessary through hoarding and/or planting, and incorporated within <b>Chapter 10: Landscape and Visual Amenity</b> of the ES [6.1].</p>
Suffolk County Council	As Suffolk is located to the north/north-east of the site, the likelihood of glint and glare is very limited, as solar panels would be orientated either west and east or south, and would cause glint and glare into those directions.	The results and recommendations of the glint and glare assessment in <b>Appendix 10G</b> of the ES have been incorporated into the Scheme design. Glint and glare effects have been mitigated where necessary through

Consultee	Matter raised	Response
		hoarding and/or planting, and incorporated within <b>Chapter 10: Landscape and Visual Amenity</b> of the ES [6.1].
Terling and Fairstead Parish Council	The Parish Council welcomes the opportunity to engage further with the proposal and supports the need for further assessment to be undertaken prior to any submission of the DCO application. This includes reviewing glint and glare..	The Parish Councils had the opportunity to review the information provided in the PEI Report and have been kept informed at regular liaison meetings / leaflets/events, and Statutory Consultation, which included a summary of the environmental surveys and findings.  Details of the Scheme design are presented in <b>Chapter 2: The Scheme</b> of the ES.
Terling and Fairstead Parish Council	The loss of amenity with regards to the extensive network of PRow across the proposed site must be assessed and the effect of glint and glare on those utilising the PRow is also a factor.	Full details of the baseline conditions and receptors are presented in <b>Chapter 10: Landscape and Visual Amenity</b> of the ES. The glint and glare assessment does not assess the impact on PRow as it is not standard practice and it is considered that users of PRow are not sensitive receptors in that they are mobile and are able to limit their exposure to any glint and glare by turning away from the area.
Terling and Fairstead Parish Council	Glint and glare stated that this can be significant but appears to be minimised in the report, though this is covered later in section 14.4.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES.
Terling and Fairstead Parish Council	The Parish Council seeks assurance that Glint and Glare will be assessed from all roads and PRow within the buffer-zoned areas.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES and has assessed the impacts on six roads within the 1km

Consultee	Matter raised	Response
Terling and Fairstead Parish Council	An assessment of snow and its possible temporary affects (perhaps on glinting) should be considered.	study area for glint and glare.  The glint and glare assessment in <b>Appendix 10G</b> of the ES does not assess snow on panels, which should reduce the reflectivity of the panels and mitigate glint and glare.
Terling and Fairstead Parish Council	The Parish Council notes from the booklet and questionnaire circulated on 30 October 2020 to all residents within the proposed site and buffer zone the statement on page 10: "We will conduct ..assessments of the scheme's potential environmental impacts such as .. glint and glare." The Parish Council expects the applicant to deliver on its undertaking to the community.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES.
Boreham Parish Council	BPC supports the need for further detailed assessment to be undertaken prior to any submission of the DCO application and welcomes the opportunity to participate at all stages of the process. This includes reviewing ... glint and glare....	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES.
Boreham Parish Council	There is a risk that glint, glare from site lighting may also disrupt the activities of wildlife including bats and owls.	The Design Principles set out the method of lighting the Scheme without disruption to wildlife, and is also referenced in <b>Chapter 8: Ecology, Chapter 10: Landscape and Visual Amenity [6.1]</b> , and the <b>Outline CEMP</b> .
Boreham Parish Council	The impact of glint and glare is given low priority in documents provided. Glint and glare may impact users of public rights of way, road users and may impact wildlife. There are anecdotal reports of migrating waterfowl striking panels in solar fields, mistaking them for water, although BPC is unaware of any specific evidence for this.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. The effects of glint and glare, and their impact on road receptors is assessed in the glint and glare assessment. Ecological impacts are presented in <b>Chapter 8: Ecology</b> of the ES, no significant effects on birds are predicted as a result of the Scheme.

Consultee	Matter raised	Response
Hatfield Peverel Parish Council	While acknowledged that 'glint and glare' can be significant, it seems to be downplayed elsewhere in the report (section 14). The assessment will need to be robust and independent for a proposal of this size. Detailed information is unavailable to comment further at this moment in time.	The glint and glare assessment is included in <b>Appendix 10G</b> of the ES. Each technical assessment has been completed by suitable qualified and experienced persons. The expertise and qualifications held by each technical lead is included within the Statement of Competence <b>[EN010118/APP/6.2]</b> .

### Assessment Methodology

16.2.10 The glint and glare assessment methodology has been defined with reference to consultation from stakeholders, as presented in **Table 16-1** and a review of available guidance and studies. No process for determining and contextualising the effects of glint and glare are provided in the available guidance. Additionally, there are no specific guidelines for assessing the impact of solar reflections upon surrounding roads, byways, footpaths, and dwellings.

16.2.11 Therefore, the approach has been informed by the legislation and guidance presented in **Appendix 10G: Glint and Glare Assessment** of the ES and stakeholder consultation carried out. The approach is to determine whether a reflection from the Scheme is geometrically possible and then to compare the results against the relevant guidance and studies to determine whether the reflection is significant.

16.2.12 In summary, the assessment methodology includes the following:

- a. Identifying receptors in a study area surrounding the Order limits. The study area varies depending on the type of receptor:
  - i. Aviation receptors: within 30km of the Order limits; and
  - ii. Ground-based receptors (including railway, road, and residential): within 1km of the Order limits and have a potential view of the panels as informed by the ZTVs (see Figure 10-8 and Figure 10-9; and **Appendix 10B: LVIA Methodology [6.2]**;
- b. Considering direct solar reflections from the Scheme towards the identified receptors by undertaking geometric calculations;
- c. Considering the visibility of the panels from the receptor's location. If the panels are not visible from the receptor then no reflection can occur;
- d. Based on the results of the geometric calculations, determining whether a reflection can occur, and if so, at what time it will occur;

- e. Considering both the solar reflection from the Scheme and the location of the direct sunlight with respect to the receptor's position;
- f. Considering the solar reflection with respect to published studies and guidance – including intensity calculations where appropriate; and
- g. Determining whether a significant detrimental effect is expected in line with the significance criteria outlined below.

16.2.13 Within the assessment model, the Scheme and relevant receptor locations are defined. From this information, criteria is produced that states whether a reflection can occur, the duration, and the part of the development that can produce the solar reflection towards the receptor. The glint and glare assessment bases the initial modelling on a flat earth and bare earth scenario (i.e. no vegetation or topography) and assumes clear skies 100% of daylight hours, using these assumptions to model the 'worst-case' predictions.

16.2.14 Although there is no specific guidance set out to identify the magnitude of impact from solar reflections on static receptors, the following criteria has been set out for the purposes of the glint and glare assessment:

- a. High - Solar reflections impacts of over 30 hours per year or over 30 minutes per day;
- b. Medium - Solar reflections impacts between 20 and 30 hours per year or between 20 minutes and 30 minutes per day;
- c. Low - Solar reflections impacts between 0 and 20 hours per year or between 0 minutes and 20 minutes per day; and
- d. None - Effects not geometrically possible or no visibility of reflective surfaces likely due to high levels of intervening screening.

### **Baseline Conditions**

16.2.15 The agricultural land use within the study area results in a generally 'open' character to the landscape, although there are notable areas of vegetation, in terms of field boundaries, roadside and residential garden vegetation and woodland blocks, such that the vegetation patterns are varied across the Order limits and the glint and glare study area, and provide existing screening for surrounding receptors.

16.2.16 Full details of the baseline conditions, and future baseline can be found in **Chapter 10: Landscape and Visual Amenity** of the ES.

### **Receptors**

16.2.17 Within the respective study areas, there are 133 residential receptors, 80 road receptors, 8 rail receptors, and 20 aviation receptors considered in the glint and glare assessment. The receptor locations are shown within Appendix A of the glint and glare assessment.

### **Residential Receptors**

16.2.18 Residential receptors that are within or close to 1km of the Order limits and have potential views of the panels are considered in the assessment. Where there are a number of residential receptors within close proximity, a representative dwelling or dwellings has been chosen for detailed analysis as

the impacts will not vary to any significant degree. Where small groups of receptors are evident, the receptors on either end of the group have been assessed in detail. A total of 99 residential receptors have been assessed, as 34 residential receptors were located within no-reflection zones.

### *Road and Rail Receptors*

- 16.2.19 Roads that are within or close to 1km of the Order limits and have potential views of the panels have been considered in the assessment. There are six roads within the 1km study area that required a detailed glint and glare assessment: the A12, Leighs Road, Boreham Road, Cranham Road, Terling Hall Road, and Waltham Road. There are some minor roads which serve dwellings; however, these have been dismissed as vehicle users of these roads will likely be travelling at low speeds and therefore, there is a negligible risk of safety impacts resulting from glint and glare of the Scheme.
- 16.2.20 There is one railway line that passes along the southern boundary of the Order limits which required assessment.

### *Aviation Receptors*

- 16.2.21 Should a solar farm be proposed within the safeguarded zone of an aerodrome then a full geometric study may be required which would determine if there is potential for glint and glare at key locations, most likely on the descent to land. Buffer zones to identify aviation assets vary depending on the safeguarding criteria of that asset. All aerodromes within 30km will be identified, however generally the detailed assessments are only required within 20km for large international/licensed aerodromes. There are 20 aerodromes within 30km of the Order limits. However, only Earls Colne and Andrewsfield required a detailed assessment as the Scheme is located within the 20km safeguarding buffer zone for international airports and licensed airfields.

### *Embedded Design Mitigation*

- 16.2.22 The embedded design mitigation for screening the Scheme from view of receptors to glint and glare as well as landscape and visual impacts is described in detail in **Chapter 10: Landscape and Visual Amenity** of the ES. These measures will be secured through the Outline Landscape and Ecology Management Plan (LEMP).
- 16.2.23 This includes:
- a. Careful siting of the Scheme in the landscape with offsets from existing residential areas, vegetation patterns and road networks;
  - b. Conserving landscape, ecology and archaeological features (including below ground) within the Order limits; and
  - c. Creating new Green Infrastructure (i.e. vegetation planting) within the Order limits with extensive planting proposals.

### *Assessment of Potential Effects*

- 16.2.24 Solar reflections are possible at 93 of the 99 residential receptors assessed within the 1km study area. The initial bald-earth scenario identified potential impacts as **High** at 75 receptors, **Medium** at six receptors, **Low** at 12

receptors and **None** at the remaining 6 receptors. Upon reviewing the actual visibility of the receptors, glint and glare impacts remain **High** for 10 receptors and reduce to **Low** for 7 receptors, and **None** for all remaining receptors, this is because the model does not consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills and buildings. Once mitigation was implemented within the Scheme design, impacts remained **Low** for 7 receptors and reduced to **None** for all remaining receptors. Therefore, overall impacts on residential receptors are **acceptable** and **not significant**.

16.2.25 Solar reflections are possible at 53 of the 56 road receptors assessed within the 1km study area. Upon reviewing the actual visibility of the receptors, glint and glare impacts remain **High** for 8 receptors and reduce to **None** for the remaining 48 receptors. Once mitigation was implemented, overall impacts at all road receptors reduce to **None** and are therefore **not significant**.

16.2.26 Solar reflections are possible at 2 of the 3 rail receptors assessed within the 1km study area. Upon reviewing the actual visibility of the receptors, glint and glare impacts reduce to **None** for all receptors. Therefore, overall impacts for rail receptors are **None** and are therefore **not significant**.

16.2.27 4 runways and 2 Air Traffic Control Towers were assessed in detail at Earls Colne Airfield and Andrewsfield Airfield and the impacts were found to be **None** and **not significant** as there is no glare anticipated at the runways or Air Traffic Control Towers.

### **Mitigation Measures**

16.2.28 Mitigation measures are required to be put in place due to the **High** impacts that were found during the visibility analysis at 10 Residential Receptors and 8 Road Receptors. As part of the development of the Scheme, three categories of planting have been proposed:

- a. Advanced Mitigation Planting (planted 2021/2022);
- b. Construction Day 1 Planting (planted at the beginning of construction);  
and
- c. Residual Mitigation Planting (planted at the end of construction).

16.2.29 This includes hedgerows to be grown, infilled, gapped up and maintained to a height of at least 3m. It is assumed that planting will grow at 33cm per year (as set out in **Chapter 10 Landscape and Visual Assessment** Section 10.3) and therefore until those hedgerows are grown sufficiently, a temporary 3m temporary wooden solid hoarding will be implemented and then removed once the hedgerows are of a sufficient height. Further information is presented in **Appendix 10G: Glint and Glare Assessment** of the ES. These measures will be secured through the Outline Landscape and Ecology Management Plan (LEMP).

16.2.30 The effects of glint and glare and their impact on local receptors has been analysed in detail and there is predicted to be **Low** impacts at 7 Residential Receptors, whilst the remaining ground-based receptors are expected to have **No Impacts** once mitigation measures have been considered. Impacts upon



aviation receptors are predicted to be **None**. Therefore, overall impacts are **Negligible**.

### **Residual Effects**

16.2.31 With the proposed embedded design and additional mitigation including Advanced Mitigation Planting, Construction Day 1 Planting, and Residual Mitigation Planting, gapping up existing hedgerows, and planting new hedgerows and trees, **no significant residual effects** are anticipated as a result of the Scheme.

### **Cumulative Effects**

16.2.32 The long list of cumulative schemes is presented in **Appendix 5A** of the ES. The assessment summarised above identified that with the introduction of the additional mitigation, receptors will not experience significant effects as a result of the Scheme, which are judged to be negligible. Therefore, cumulative effects would be unlikely and are not considered to arise for glint and glare. The overall impact of the Scheme is considered not significant.

## **16.3 Ground Conditions**

### **Introduction**

16.3.1 This section of the Other Environmental Topics chapter reviews Land Condition and Ground Conditions.

16.3.2 The Scoping Report identified that an assessment of impacts relevant to Land Quality would be presented as part of an 'Other Environmental Issues' chapter of the ES. **Chapter 12: Socio-Economics and Land Use** of the ES provides further details of the agricultural land quality of the Order limits and percentage proposed use of each grade.

16.3.3 The Phase 1 Preliminary Risk Assessment (PRA) assesses the land condition within the Order limits prior to construction. The PRA has been developed based on desk-top studies and site walkovers and was based on the area of the site presented within the PEI Report (the PEI Boundary) which was greater than the Order limits forming the Application. The assessment was undertaken on a precautionary basis based on the larger area of land being considered, and therefore ensures the area of land being considered is greater than the Order limits. The full PRA is presented in **Appendix 16A of the ES**. This section provides a summary of the assessment within the PRA.

16.3.4 The Model Procedures for the Management of Land Contamination indicates that the first step in evaluating land contamination risks is a PRA. The objective of the PRA is to identify and evaluate potential land quality risks and development constraints associated with the Scheme and to construct an initial conceptual site model that can be used to inform future decision making and the design future ground investigation.

16.3.5 A Phase 1 PRA report has been prepared, covering land within the Order limits, and is available in **Appendix 16A** of the ES.

16.3.6 The Phase 1 PRA includes the following:

- a. Details of land within the Order limits and surrounding land including development history, geology, hydrogeology, hydrology, soil and groundwater quality and environmental setting;
- b. Details of any available site investigation reports for land within the Order limits;
- c. Details from a site walkover documenting:
  - i. The existing layout, current operations and condition of land within the Site, the property boundaries and immediately surrounding land;
  - ii. The visual inspection of any accessible site storm-water, foul and offsite effluent discharges;
  - iii. A visual inspection (non-intrusive) of the external building fabric of potential structures and inspection of an asbestos register (if available);
- d. An initial Conceptual Model (iCM) and an evaluation of potential contamination linkages; and
- e. Conclusions and recommendations based on the findings.

### **Relevant Legislation, Guidelines and Policy**

16.3.7 The Phase 1 PRA report in **Appendix 16A** [6.2] provides an overview of the relevant legislation, guidance and policy for ground conditions.

### **Consultation Responses**

16.3.8 Consultation responses to the EIA Scoping Report are summarised below in **Table 16-2**.

**Table 16-2: Consultation matters and responses for Ground Conditions**

<b>Consultee</b>	<b>Matter raised</b>	<b>Response</b>
Planning Inspectorate	Noting that a Phase 1 Preliminary Risk Assessment (PRA) “is being prepared”, the Scoping Report states that incorporation of the results and recommendations of the PRA and the measures set out in Table 14-1 of the Scoping Report (pages 144 and 145) into an Outline CEMP would negate the need for a specific Ground Conditions chapter in the ES. As the results of the PRA are not yet available, there is insufficient information at this stage regarding the baseline and potential impacts to allow the Inspectorate to conclude that construction and decommissioning of the Proposed Development will not significantly affect ground	<p>The Phase 1 PRA includes an assessment of potential impacts on ground conditions during construction and decommissioning of the Proposed Development, where significant effects are likely, and is available within <b>Appendix 16A</b>. The potential risks have been identified as very low to low.</p> <p>A number of environmental design and management measures will be employed as standard industry good practice to minimise impacts to both human health and controlled waters during the construction and decommissioning phases of the Scheme. These have been incorporated into the</p>

Consultee	Matter raised	Response
	<p>conditions and that a detailed assessment is not required. Braintree District Council has also advised that there are records of contaminated land within the application site (see Appendix 2 of this Opinion). The ES should include an assessment of potential impacts on ground conditions during construction and decommissioning of the Proposed Development, where significant effects are likely. Potential operational impacts are discussed below. The ES should describe the measures relied upon to manage impacts on ground conditions during construction and decommissioning of the Proposed Development and explain how these would be delivered and secured, through cross-reference to the PRA, Outline CEMP and the DCO.</p>	<p>Outline CEMP. The Outline CEMP is presented in <b>Volume 7</b> of the ES [EN010118/APP/7.10].</p> <p>A Decommissioning Strategy has been prepared to identify required measures to prevent pollution during this phase of the development, based on the detailed decommissioning plan. The Decommissioning Strategy is presented in <b>Volume 7</b> of the ES [EN010118/APP/7.12]</p>
<p>Planning Inspectorate</p>	<p>The Scoping Report explains that an Operational Environmental Management Plan, to include a spillage Emergency Response Plan, would address any risks arising from maintenance activities during operation of the Proposed Development. The Inspectorate has considered the nature and characteristics of the Proposed Development and agrees that significant effects are not likely to occur. An assessment of impacts from operational activities on ground conditions can be scoped out of the ES. However, the Applicant should append a draft/ outline copy of the Operational Environmental Management Plan, including the spillage Emergency Response Plan, to the ES and/ or demonstrate how this will be secured through the DCO or other legal mechanism.</p>	<p>The Outline CEMP is presented in <b>Volume 7</b> of the ES [EN010118/APP/7.10].</p> <p>The Outline OEMP is presented in <b>Volume 7</b> of the ES [H EN010118/APP/7.11].</p> <p>The Outline OEMP includes mitigation measures to address any potential risks from spillages during the operational phase of the Scheme.</p>
<p>Planning Inspectorate</p>	<p>Any impacts from ground conditions on the health of construction/ maintenance/</p>	<p>The Phase 1 PRA addresses impacts from ground conditions on workers, and is available</p>

Consultee	Matter raised	Response
	decommissioning workers should be assessed where significant effects are likely.	<p>within <b>Appendix 16A</b> of the ES. The potential risks have been identified as very low to low.</p> <p>Construction workers are protected under existing health and safety legislation, any potential effects are considered to be temporary and will be avoided, prevented and reduced through the implementation of standard mitigation measures incorporated within the Outline CEMP.</p>
Essex County Council	Paragraph 14.5.3 states that details of land designated for Mineral Safeguarding will be included in a Phase 1 Preliminary Risk Assessment (PRA). From this, it is not possible to understand the extent to which details will be provided and the context within which conclusions, if any, will be drawn.	Further details are included in the Planning Statement <b>[EN010118/APP/7.2]</b> , the <b>Minerals Safeguarding Assessment [EN010118/APP/7.7]</b> and <b>Chapter 12: Socio-Economics</b> which are submitted with the Application.
Essex County Council	As set out in Policy S8 of the MLP, applications for non-mineral development in land designated as a Minerals Safeguarding Area are required to be supported by a Minerals Resource Assessment (MRA). Further detail is provided in Appendix 3 of this response. It is assumed that the PRA is not intended to substitute for the requirements of MRA.	A Minerals Safeguarding Assessment has been prepared. The PRA is not intended as a substitute for the requirements of the MRA.
Terling and Fairstead Parish Council	The Parish Council notes from the booklet and questionnaire circulated on 30 October 2020 to all residents within the proposed site and buffer zone the statement on page 10: "We will conduct a ...assessments of the scheme's potential environmental impacts such as ... ground conditions ..." The Parish Council expects the applicant to deliver on its undertaking to the community.	<p>The Phase 1 PRA is available within <b>Appendix 16A</b> of the ES and the potential risks have been identified as very low to low.</p> <p>This section provides a summary of the PRA.</p>

Consultee	Matter raised	Response
<b>Planning Inspectorate</b>	The Applicant proposes that an assessment of impacts relevant to Land Quality is presented as part of an 'Other Environmental Issues' chapter of the ES. The Inspectorate agrees with this approach and is content that any significant effects on land quality can be assessed within the 'Other Environmental Issues' chapter of the ES.	Noted

### Assessment Methodology

16.3.9 The assessment of ground conditions is based on the maximum parameters set out by the Design Principles. This includes the maximum depth of construction activities and infrastructure, along with the maximum area allowed to be disturbed during construction and developed by the Scheme.

16.3.10 The assessment involved a desk-based review of the Order limits to identify historic land uses and the geological, hydrological, hydrogeological, and ecological setting of the Order limits. A walkover of publicly accessible land was undertaken to identify environmental and ground conditions which may represent a potential future liability. A study area has been defined as the Order limits plus a 1km radius.

16.3.11 The risk assessment is based on current good practice guidance. This is presented in **Appendix 16A: Phase 1 PRA** of the ES [EN010118/APP/6.2]. The magnitude of risk associated with potential contamination within the Order limits has been assessed. To do this, an estimate has been made of:

- The magnitude of the potential consequence (i.e. severity), which is classified according to the criteria in **Table 16-3**; and
- The magnitude of probability (i.e. likelihood) which is classified in accordance with the criteria in **Table 16-4**.

**Table 16-3: Description of Severity of Risk**

Term	Description
Severe	<ul style="list-style-type: none"> <li>– Highly elevated concentrations likely to result in significant harm to human health.</li> <li>– Catastrophic damage to crops, buildings or property (e.g. by explosion).</li> <li>– Equivalent to Environment Agency (EA) Category 1 pollution incident including persistent and/or extensive effects of water quality.</li> <li>– Major damage to aquatic or other ecosystems.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>– Elevated concentrations which could result in significant harm to human health.</li> <li>– Significant damage to crops, buildings or property (e.g. damage to building rendering it unsafe).</li> <li>– Equivalent to EA Category 2 pollution incident including significant effect on water quality.</li> <li>– Significant damage to aquatic or other ecosystems.</li> </ul>
Mild	<ul style="list-style-type: none"> <li>– Exposure to human health unlikely to lead to significant harm.</li> </ul>

<i>Term</i>	<i>Description</i>
	<ul style="list-style-type: none"> <li>– Minor damage to crops, buildings or property (e.g. surface spalling to concrete).</li> <li>– Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality.</li> <li>– Minor or short-lived damage to aquatic or other ecosystems.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>– No measurable effect on humans.</li> <li>– Repairable effects of damage to buildings, structures and services.</li> <li>– Equivalent to insubstantial pollution incident with no observed effect on water quality of ecosystems.</li> </ul>

**Table 16-4: Likelihood of Risk Occurrence**

<i>Likelihood</i>	<i>Explanation</i>
High	Contaminant linkage may be present that appears very likely in the short-term and risk is almost certain to occur in the long term, or there is evidence of harm to the receptor.
Likely	Contaminant linkage may be present, and it is probable that the risk will occur over the long term.
Low	Contaminant linkage may be present and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.

16.3.12 An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in **Table 16-5**.

**Table 16-5: Evaluation of Risk Level**

		<i>Severity</i>			
		<b>SEVERE</b>	<b>MEDIUM</b>	<b>MILD</b>	<b>MINOR</b>
<i>Likelihood</i>	<b>HIGH</b>	Very High	High	Moderate	Low
	<b>LIKELY</b>	High	Moderate	Moderate/Low	Low
	<b>LOW</b>	Moderate	Moderate/Low	Low	Very Low
	<b>UNLIKELY</b>	Moderate/Low	Low	Very Low	Very Low

16.3.13 The requirements for further works or mitigation are dependent on the significance of the risk. Generally, ‘moderate’ to ‘very high’ risks are considered to be significant and in need of further assessment/ mitigation and ‘very low’ to ‘low’ risks are generally considered insignificant and not requiring further assessment/mitigation. Professional judgement is often required in the determination of whether an effect is considered to be significant by taking account of whether effects are considered to be positive or negative, permanent or temporary, direct or indirect, the duration and frequency of the effect and whether any secondary effects are caused.

16.3.14 A detailed unexploded Ordnance (UXO) Assessment was undertaken by 1st Line Defence in July 2021, as the regional unexploded bomb (UXB) mapping published by Zetica shows that although the Order limits lie within a zone that experiences a low risk of UXB, they are in close proximity (250m) to a former airfield, which is considered a wartime site of interest, and ordnance was reported to have been identified to the south of the Order limits.

### **Baseline Conditions**

- 16.3.15 The Order limits comprises agricultural fields, with the River Ter and the Boreham Tributary flowing across the northern and south-western extent of the Order limits, respectively.
- 16.3.16 The anticipated geology includes quaternary deposits over sedimentary bedrock of the London Clay Formation. The superficial deposits are classified as Secondary Aquifers and the solid geology of the London Clay Formation is classified as Unproductive Strata.
- 16.3.17 The indicative floodplain map for the area, published by the Environment Agency, shows that the risk of surface water flooding at the Order limits is generally very low (annual chance of flooding of less than 0.1%) with isolated patches of low (chance of flooding of between 0.1% and 1%), medium (chance of flooding of between 1% and 3%) and high risk (chance of flooding of greater than 3.3%) generally associated with the River Ter in the northern part of the Order limits and its tributaries, as well as isolated patches across the Order limits. Further details on flood risk and hydrology can be found within **Chapter 9: Water Environment** of this ES [6.2].
- 16.3.18 Based on a review of historical maps, the Order limits was undeveloped land/agricultural fields since the earliest available historical maps (late 1800's), with part of the Order limits used as orchard or nursery between the 1920s and 1950s. From the 1920's to 1940's Boreham Rifle Range is shown in the southern part of the Order limits.
- 16.3.19 Potential contaminative sources identified locally on-site may be associated with historical pits, of small size, scattered across the Order limits or bordering the Order limits, which may have been filled with a variety of (potentially unlicensed) waste materials. Off-site sources may include farmland, with farm buildings and yards where fuel and agricultural materials were/are stored, shown at various locations adjacent to the Order limits. No change is expected to apply to the Future Baseline of the Order limits.

### **Assessment of Potential Effects**

- 16.3.20 A risk assessment of the identified plausible contaminated linkages has been undertaken for the study area in line with current legislation. The assessment takes into consideration the sources of possible contaminant risks and the presence of any plausible pathways or receptors. Potential contaminative sources identified locally on-site may be associated with historical pits, of small size, scattered across the Order limits or bordering the Order limits, which may have been filled with a variety of (potentially unlicensed) waste materials. Off-site sources may include farmland, with farm buildings and yards where fuel and agricultural materials were/are stored, shown at various locations adjacent to the Order limits.
- 16.3.21 The potential risks that have been identified have all been assessed by the PRA as being very low to low, presented in **Table 16-6**.
- 16.3.22 The information collected as part of the PRA suggests that there are no significant constraints with regards to contamination of soil and groundwater that would limit the development of the Order limits.

**Table 16-6 Potential Sources Pathways and Receptors**

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
S1: Made Ground and Historical Boreham Rifle Range (metals, semi-metals, asbestos, organic and inorganic compounds. Gases such as methane or carbon dioxide and leachate)	P1: Direct contact, dermal absorption or ingestion of soil.	R2: Current Site Users	Mild	Unlikely	Very Low	Made ground of unknown quality may be associated with any infilling of the small historical pits on site. The volume of the infill is relatively small and unlikely to represent a significant widespread issue. Current users are farmers and general public who might be exposed to soils. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the current use of the site as agricultural fields.
	P1: Direct contact, dermal absorption or ingestion of soil.	R3: Future Site Users	Mild	Unlikely	Very Low	Made ground of unknown quality may be associated with any infilling of the small historical pits on site. Future users include site visitors/trespassers/general public on the Order limits using the PRoW who might be exposed to soils. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable, given the proposed use of the site.
	:P1: Direct contact, dermal absorption or ingestion of soil.	R8: Fauna (livestock/ small grazing animals)	Minor	Unlikely	Very Low	Livestock may be currently present on-site; and small grazing animals such as sheep may be present on-site after construction. The risk of harm to livestock and small grazing animals is considered to be very low, since limited potential for ground contamination has been identified at the Order limits. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P2: Ingestion of fruit and vegetables and/ or waters.	R2: Current Site Users	Mild	Unlikely	Very Low	Limited potential for ground contamination has been identified at the Order limits. Therefore, risk of harm to human health from ingestion of



Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
						fruit/vegetables/water is considered to be very low. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P2: Ingestion of fruit and vegetables and/or waters.	R8: Fauna (livestock/ small grazing animals)	Minor	Unlikely	Very Low	Limited potential for ground contamination has been identified at the Order limits. The risk of harm to livestock/small grazing animals is considered to be very low. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P3: Inhalation of soil particulates and vapour derived from soils.	R2: Current Site Users	Mild	Unlikely	Very Low	Limited potential for ground contamination has been identified at the Order limits. Limited potential for soil vapour exists at the Order limits, given the age of the potentially infilled historical pits. Therefore, risk of inhalation of soil particulates is considered to be very low. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P3: Inhalation of soil particulates and vapour derived from soils.	R3: Future Site Users	Mild	Unlikely	Very Low	Limited potential for ground contamination has been identified at the Order limits. Limited potential for soil vapour exists at the Order limits, given the age of the potentially infilled historical pits. Therefore, risk of inhalation of soil particulates is considered to be very low. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P3: Inhalation of soil particulates and vapour derived from soils.	R8: Fauna (livestock/ small grazing animals)	Minor	Unlikely	Very Low	Limited potential for ground contamination has been identified at the Order limits. Limited potential for soil vapour exists at the Order limits, given the age of the potentially infilled historical

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
						pits. The risk of harm to livestock/small grazing animals is considered to be very low. Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P4: Migration of hazardous gases/vapours via permeable strata into confined spaces (asphyxiation/explosion)	R3: Future Site Users	Medium	Unlikely	Low	Ground gas accumulation and potential explosion risk is generally unlikely at the Order limits, given that limited potential sources of hazardous gases/vapours have been identified on-site. The Scheme will include switch housing/control room in terms of structures, and are not located in areas where substantial infilled pits have been identified (in the south western corner of the Order limits the only infilled pit identified is a gravel pit approximately 3m across shown on the 1874 map). Contaminant linkage may be present but the circumstances under which harm would occur even in the long-term are improbable.
	P6: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R5: Superficial Aquifers	Minor to Medium	Unlikely	Very Low to Low	Complete pathways may be present but current information suggests a gross source is unlikely. The risk of harm to groundwater from leaching of contaminants is considered between low (for Secondary A Aquifers - Glaciofluvial deposits and Alluvium) and very low (for Secondary B Aquifer - Brickearth deposits; and Secondary Undifferentiated Aquifers - Head deposits and Lowestoft Formation).
	P7: Direct contact with contaminated soils	R7: Flora (plants, trees, landscaping, crops)	Minor	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. Potential risk from direct contact with contaminated soils for plants, trees, landscaping and crops is considered very low. As indicated in the Outline CEMP, <i>"the Scheme would avoid, as far as reasonably practicable,</i>

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
						<i>areas of high-quality habitat, such as mature trees and woodland/wetland habitats” and “throughout the Scheme, undeveloped buffers will be included to protect all hedgerows, veteran/ancient trees, ponds and ancient woodland during construction and operation”.</i>
	P8: Uptake via root system	R7: Flora (plants, trees, landscaping, crops)	Minor	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. Potential risk from direct contact with contaminated soils for plants, trees, landscaping and crops is considered very low.
	P9: Direct contact of buried concrete with contaminated soils (i.e. hydrocarbons) and aggressive ground conditions (pH and sulphate).	R9: Buildings and Infrastructure: Concrete (PV Mounting Structure and cables)	Minor	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. Potential risk from direct contact with contaminated soils for buried concrete and infrastructure (PV Mounting Structure and cables) is considered very low.
	P10: Direct contact of services and supply pipes with contaminated soils.	R11: Buildings and Infrastructure: Supply pipes	Minor	Unlikely	Very Low	Complete pathways may be present for water supply pipes at properties located off-site from on-site sources, but current information suggests a gross source is unlikely.
	P11: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R10: Buildings and Infrastructure: Structures	Mild	Low	Low	Ground gas accumulation and potential explosion risk is generally unlikely at the Order limits, given that limited potential sources of hazardous gases/vapours have been identified.
S2: Off-site farm buildings and yards where fuel and	P3: Inhalation of particulates derived from soils	R2: Current Site Users	Mild	Unlikely	Very Low	Potential localised contaminant hotspots may be associated with the farm buildings located adjacent to the Order limits at various locations.

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
agricultural materials were/are stored. (metals, semi-metals, asbestos, organic and inorganic compounds, pesticides and fertilizers).	P3: Inhalation of particulates derived from soils	R3: Future Site Users	Mild	Unlikely	Very Low	Potential localised contaminant hotspots may be associated with the farm buildings located adjacent to the Order limits at various locations.
	P3: Inhalation of particulates derived from soils	R8: Fauna (livestock/ small grazing animals)	Minor	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. The risk of harm to livestock/small grazing animals is considered to be very low.
	P5: Spillage/loss/run off from surface directly to receiving water	R6: Surface waters	Minor to Medium	Unlikely	Very Low to Low	Complete pathways may be present but current information suggests a gross source is unlikely. The risk of harm to surface waters from run off from off-site contaminated soil is considered between very low (for drains and ponds located on-site) to low (River Ter, and Boreham Tributary and tributaries).
	P6: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R5: Superficial Aquifers	Minor to Medium	Unlikely	Very Low to Low	Complete pathways may be present but current information suggests a gross source is unlikely. The risk of harm to groundwater from leaching of contaminants and lateral migration to the Site is considered between low (for Secondary A Aquifers - Glaciofluvial deposits and Alluvium) and very low (for Secondary B Aquifer - Brickearth deposits; and Secondary Undifferentiated Aquifers - Head deposits and Lowestoft Formation)
S3: Off-site historical quarries. (metals, semi-metals, asbestos, organic and inorganic compounds. Gases such as methane	P3: Inhalation of soil particulates or vapour derived from soils	R2: Current Site Users	Mild	Unlikely	Very Low	Infilled unlicensed materials may be associated with the former quarries located adjacent west of the Order limits (although unlikely). Current users are farmers and general public who might be exposed to soil vapour deriving from these areas.
	P3: Inhalation of soil particulates or vapour derived from soils	R3: Future Site Users	Mild	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. Future site users (trespassers/site visitors/general public on the Order limits using the PRow (if

Source	Pathway	Receptor	Potential Severity	Likelihood of Occurrence	Potential Risk (LCRM)	Justification
or carbon dioxide and leachate)						retained)) might be exposed to soil vapour deriving from these areas.
	P3: Inhalation of soil particulates or vapour derived from soils	R8: Fauna (livestock / small grazing animals)	Minor	Unlikely	Very Low	Complete pathways may be present but current information suggests a gross source is unlikely. The risk of harm to livestock / small grazing animals is considered to be very low.
	P4: Migration of hazardous gases/vapours via permeable strata into confined spaces (asphyxiation/explosion)	R3: Future Site Users	Mild	Low	Low	Complete pathways may be present but current information suggests a gross source is unlikely. Ground gas accumulation and potential explosion risk (deriving from off-site sources, associated with infilled land in the historical quarries) is considered unlikely at the Order limits.
	P6: Leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater	R5: Superficial Aquifers	Minor to Medium	Unlikely	Very Low to Low	Complete pathways are unlikely, given that most of the Order limits extends east of the former quarries (except for the area of the Bulls Lodge Substation), and assuming a groundwater flow direction towards the south. The risk of harm to groundwater from leaching of contaminants and lateral migration to the Order limits is considered between low (for Secondary A Aquifers - Glaciofluvial deposits and Alluvium) and very low (for Secondary B Aquifer - Brickearth deposits; and Secondary Undifferentiated Aquifers - Head deposits and Lowestoft Formation)
	P11: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches	R10: Buildings and Infrastructure: Structures	Mild	Low	Low	Complete pathways may be present but current information suggests a gross source is unlikely. Ground gas accumulation and potential explosion risk (deriving from off-site sources, associated with historical quarries) is unlikely at the Order limits.

## Mitigation Measures

16.3.23 The assessment of potential effects takes into account that the measures included in **Table 16-7** will be implemented. These standard (or tertiary) mitigation measures are included in **Volume 7: Outline CEMP** of the ES.

**Table 16-7 Construction Standard Environmental Mitigation Measures**

<i>Potential Impact</i>	<i>Mitigation / Enhancement Measure</i>
<p>Potential for risks to human health associated with waste generation, land contamination, airborne contamination and groundwater contamination. The discovery of ground contamination during groundworks. Levelling of the Order limits including the possible introduction of new fill materials.</p>	<p>Ground investigation works (if any) will be undertaken prior to commencing construction and will be included within the detailed CEMP produced prior to construction. Results would be reviewed by the appointed contractor, including any additional investigation or mitigation measures beyond the impact avoidance measures stated here.</p> <p>Best practice avoidance and mitigation measures proposed include:</p> <ul style="list-style-type: none"> <li>• All workers would be required to wear Personal Protective Equipment (PPE) such as dust masks as applicable;</li> <li>• Containment measures would be implemented, including drip trays, bunding or double-skinned tanks of fuels and oils; all chemicals would be stored in accordance with their COSHH guidelines, whilst spill kits would be provided in areas of fuel/oil storage;</li> <li>• All plant and machinery would be kept away from surface water bodies wherever possible, checked regularly and, where necessary, the use of drip trays would be employed. Refuelling and delivery areas would be located away from surface water drains;</li> <li>• An emergency spillage action plan will be produced, which staff would have read and understood, and provisions made to contain any leak/spill;</li> <li>• Should any potentially contaminated ground, including isolated 'hotspots' of contamination and/or potential deposits of asbestos containing materials (ACM), be encountered, the contractor would be required to investigate the areas and assess the need for containment or disposal of the material. The contractor would also be required to assess whether any additional health and safety measures are required;</li> <li>• To further minimise the risks of contaminants being transferred and contaminating other soils or water, construction workers would be briefed as to the possibility of the presence of such materials;</li> <li>• In the event that contamination is identified, appropriate remediation measures would be taken to protect construction workers, future site users, water resources, structures and services;</li> <li>• The contractor would be required to place arisings and temporary stockpiles away from watercourses and drainage systems, whilst surface water would be directed away from stockpiles to prevent erosion;</li> <li>• The risk to surface water and groundwater from run-off from any contaminated stockpiles during construction works would be reduced by implementing suitable measures to minimise rainwater infiltration and/or capture runoff and leachates, through use of bunding and/or temporary drainage systems. These mitigation measures would be designed in line with current good practice, follow appropriate guidelines and all relevant licences/permits;</li> </ul>

### **Potential Impact**

### **Mitigation / Enhancement Measure**

- The contractor would ensure that all material is suitable for its proposed use and would not result in an increase in contamination-related risks on identified receptors, including any landscaped areas and underlying groundwater;
- Any waters removed from excavations by dewatering would be discharged appropriately, subject to the relevant permits being obtained from the Environment Agency;
- The contractor will implement a dust suppression/management system in order to control the potential risk from airborne contamination migrating off-site to adjacent sites; and
- Piling design and construction works will be completed following the preparation of a piling risk assessment.

16.3.24 The preliminary risk assessment undertaken does not consider acute linkages for construction and maintenance workers. It is anticipated that these acute linkages will be managed by appropriate health and safety measures. As construction workers are protected under existing health and safety legislation, any potential effects are considered to be temporary and will be avoided, prevented and reduced through the implementation of standard mitigation measures (including personal protective equipment, training and toolbox talks) as included in the outline CEMP. Work will be carried out in accordance with relevant Construction Design Management (CDM) Regulations 2015.

### **Decommissioning (not earlier than 2066)**

16.3.25 Potential impacts from the decommissioning of the Scheme are assumed for the purposes of the assessment to be up to 24 months, and would be similar in nature to those during construction, as some ground work would be required to remove infrastructure. A Decommissioning Strategy has been prepared to identify required measures to prevent pollution during this phase of the development, based on the detailed decommissioning plan.

16.3.26 As a result, it is considered that the decommissioning impacts and effects would mirror those of the construction phase. Standard industry good practice mitigation measures (refer to **Table 16-7**) are expected to be applied during decommissioning, as set out within the Decommissioning Strategy.

### **Residual Effects**

16.3.27 Given the risks of contaminated land are deemed very low to low, and the well-established good industry practices in construction for managing contaminated land which will be incorporated into the CEMP and Decommissioning Strategy, it is considered that the potential effects of contamination or risk of contamination will be **negligible** and not significant.

### **Cumulative Effects**

16.3.28 Provided that the requirements of relevant policy and legislation relating to land contamination and remediation are integrated within the design and appropriate mitigation measures are applied during the demolition and construction phases of each cumulative scheme, it is considered that the cumulative effect on ground conditions will be **negligible**.

## 16.4 Major Accidents or Disasters

### *Introduction*

- 16.4.1 This section summaries 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.
- 16.4.2 'Accidents' are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g. major emission, fire or explosion).
- 16.4.3 'Disasters' are naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).
- 16.4.4 The Design Principles have been used to inform the major accidents or disasters assessment, with the exception of consideration of an accident from the BESS which has needed to be based on a Concept Design, to take account of a certain technology and number of battery cells (which is not fixed by the Design Principles). The flexibility allowed by the Design Principles do not change the conclusions of the BESS Plume Assessment, which is presented in Appendix 16B. In the event that only Phase 1 of the BESS is constructed, with the second phase not required, the area of land allocated would instead be utilised for Solar PV Arrays. Construction and operation of both phases of the BESS is considered to have the potential to result in greater effects than construction and operation of Solar PV Arrays, given its greater height and mass. The Concept Design assessed therefore assumes Work No. 2B would be occupied by Phase 2 of the BESS.

### *Relevant Legislation, Guidelines and Policy*

- 16.4.5 The EIA Regulations require consideration to be given to the risks of major accidents and disasters.
- 16.4.6 The EIA Regulations cite two specific directives as examples of risk assessments to be considered within EIA. These are the Directive 2012/18/EU of the European Parliament and of the European Council (which deals with major accident hazard registered sites) (Ref 16-22) and the Council Directive 2009/71/Euratom (which deals with nuclear sites) (Ref 16-23). Neither of these Directives is relevant to this Scheme.
- 16.4.7 The IEMA guidance document 'Major Accidents and Disasters in EIA' (Ref 16-64) has been taken into account in the assessment of major accidents or disasters.

### *Consultation Responses*

- 16.4.8 Table 16-8 presents the consultation responses and matters raised relating to major accidents and disasters, showing how and where these have been addressed in the ES. The Consultation Report (Table 8-1) records any ongoing engagement with the relevant consultation bodies.



**Table 16-8: Consultation matters and responses for Major Accidents or Disasters**

Consultee	Matter raised	Response
Planning Inspectorate	<p>The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.</p>	<p>This section summaries the potential effects of the Scheme on the environment as a result of the risk of major accidents or disasters occurring, in line with appropriate guidance. Major accidents or disasters shortlisted for further consideration within this assessment are included in <b>Table 16-9</b>. Minimising the risk of major accidents during construction, operation, and decommissioning will be addressed through appropriate risk assessments as required in the Outline CEMP, OEMP, and Decommissioning Strategy</p>
Planning Inspectorate	<p>The Inspectorate is content that any significant effects resulting from major accidents or disasters can be assessed within relevant aspect chapters of the ES and summarised within the 'Other Environmental Issues' chapter. With appropriate cross-referencing and explanation, a standalone chapter in the ES for Major Accidents or Disasters is not required.</p>	Noted.
Planning Inspectorate	<p>The Applicant proposes that construction workers, as a receptor, can be excluded from the assessment, because existing legal protection is sufficient to minimise any risk from major accidents or disasters to a reasonable level. The Inspectorate has considered the nature and characteristics of the Proposed Development and is content that significant effects on construction workers as a result of major accidents or disasters are not likely. This matter can be scoped out of the assessment.</p>	Noted
Planning Inspectorate	<p>The Scoping Report refers to a lack of established guidance for this aspect topic. The assessment should refer to the new IEMA</p>	<p>The IEMA guidance document (Ref 16-64) has been taken</p>

	guidance document 'Major Accidents and Disasters in EIA' <sup>22</sup> , where relevant.	into account within this section.
Planning Inspectorate	The Inspectorate does not consider there to be sufficient evidence available at this stage for the Applicant to omit any major accidents or disasters from the scope of assessment and expects all shortlisted accidents and disasters to be fully considered within the ES.	Major accidents or disasters shortlisted for further consideration are floods, fire, road accidents, rail accidents, aircraft disasters, flood defence failure, utilities failure, mining, and plant disease. These are presented in <b>Table 16-9</b> .
Planning Inspectorate	Table 14-1 of the Scoping Report (page 148) explains that there may be some potential for fire as a result of the battery energy storage system. Any mitigation measures relevant to safety risks associated with the battery storage system should be described in the ES and their delivery secured through the DCO (for example, the Applicant's attention is drawn to the extensive examination discussions relating to Cleve Hill Solar Park, which required the preparation of (and a DCO requirement in relation to) an Outline Battery Safety Management Plan). Effort should be made to agree any necessary measures with relevant consultation bodies.	Mitigation measures associated with battery energy storage system are presented in the Outline Battery Safety Management Plan (BSMP) <b>[EN010118/APP/7.6]</b> .  The Outline BSMP will be secured via the application.  Consultation has been undertaken with the Host Authorities, the Environment Agency and Essex Fire and Rescue and is outlined in the Consultation Report <b>[EN010118/APP/5.1]</b> submitted with the application.
Health and Safety Executive	Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development's vulnerability to major accidents. HSE's role on NSIPs is summarised in the following Advice Note 11 Annex on the Planning Inspectorate's website - Annex G – The Health and Safety Executive.	Noted. Major accidents and disasters are assessed in this Section 16.4.

<p>Health and Safety Executive</p>	<p>According to HSE's records there are no major accident hazard sites and no major accident hazard pipelines within the proposed DCO application boundary of the proposed Longfield Solar Farm for this nationally significant infrastructure project.</p>	<p>Noted.</p>
<p>Terling and Fairstead Parish Council</p>	<p>Of particular concern are the Lithium-ion batteries which are a major fire risk. The applicant has confirmed to the Planning Inspectorate [minutes of a meeting held 4th September 2020] that they are aware of safety concerns which came to light during the Cleve Hill application. Measures to mitigate, and the reality of the potential dangers, must be clearly set out for the public consultation. Consideration must be given to both internal causes of fire to the enclosures and grass fires [exceptionally]. Table 14.1 - This table lists the potential for fire as result of battery storage elements of the scheme. The EIA will have to clearly show mitigation for this risk. It also comments on the bio-diversity risk from imported non-native planting schemes introduced. The Parish Council would seek further assurances on these potential risks.</p>	<p>A summary of the fire risk considered is included in this Section 16.4. Mitigation measures associated with battery energy storage system are presented in the Outline Battery Safety Management Plan (BSMP)</p> <p>The Outline BSMP will be secured via the DCO.</p> <p>Biosecurity risks are included in <b>Table 16-9</b>: Major accidents or disasters shortlisted for further consideration.</p> <p>The planting strategy for the Scheme has been developed to use native species as described in the OLEMP [EN010118/APP/7.13]</p>
<p>Natural England</p>	<p>General Principles: Schedule 4 of the Town &amp; Country Planning (Environmental Impact Assessment) Regulations 2017, sets out the necessary information to assess impacts on the natural environment to be included in an ES, specifically:</p> <p>A description of the expected significant adverse effects of the development to the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters that are relevant to the project concerned. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</p>	<p>Noted. Where appropriate this Section 16.4, includes mitigation measures to reduce the effects of major accidents or disasters. Minimising the risk of major accidents during construction, operation, and decommissioning will be addressed through appropriate risk assessments as required in the Outline CEMP</p>

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[EN010118/APP/7.10], Outline, OEMP [EN010118/APP/7.11], and Decommissioning Strategy [EN010118/APP/7.12], respectively; and in the Outline Battery Safety Management Plan (BSMP) and the Flood Risk Assessment (FRA) [EN010118/APP/6.2] of the ES.

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16.4.9 The above responses have been taken into account and considered in the assessment below.

### *Assessment Methodology*

16.4.10 The following methodology has been adopted to assess major accidents or disasters; in general, major accidents or disasters, as they relate to the Scheme, fall into three categories:

- a. Events that could not realistically occur, due to the nature of the Scheme or its location;
- b. Events that could realistically occur, but for which the Scheme, and associated receptors, are no more vulnerable than any other development; and
- c. Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate. These events are considered within this assessment.

16.4.11 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme. This list was drawn from several sources, including the UK Government's Risk Register of Civil Emergencies (Ref 16-24). Major accidents or disasters with little relevance in the UK were not included, such as volcanic eruptions for example.

16.4.12 The long list was screened to form a shortlist of events to be taken forward for further consideration. The shortlist of events and the list of relevant chapters and assessments in which they have been scoped in to are summarised in **Table 16-9** below.

16.4.13 Although the majority of the major accidents or disasters on the long list are already considered under other legislative or design requirements, this is not considered to be sufficient reason to automatically eliminate the major accident or disaster from any further consideration. This is consistent with the approach for other topics, for example that the need to comply with nature conservation legislation does not mean that ecology and nature conservation do not need to be considered in EIA. However, where it is concluded that the need for compliance is so fundamental, and the risk of any receptors being

affected differently so remote, major accidents or disasters on the long list are not included on the shortlist.

16.4.14 Likewise, it is considered reasonable and proportionate to exclude certain receptor groups from the outset. Construction workers, as a receptor, can be excluded from the assessment (as agreed by PINS in its scoping opinion), because existing legal protection is considered to be sufficient to minimise any risk from major accidents or disasters to a reasonable level. Legislation in force to ensure the protection of workers in the workplace includes:

- a. Health and Safety at Work etc. Act 1974 (Ref 16-60);
- b. The Management of Health and Safety at Work Regulations 1999 (Ref 16-61);
- c. The Workplace (Health, Safety and Welfare) Regulations 1992 (Ref 16-62); and
- d. Construction (Design and Management) (CDM) 2015 Regulations (Ref 16-63).

**Table 16-9: Major accidents or disasters shortlisted for further consideration**

Major Accident or Disaster	Potential receptor	Comments
<b>Floods</b>	Property and people in areas of increased flood risk.	Both the vulnerability of the Order limits to flooding and climate change, and the potential for the Scheme to exacerbate flooding, are covered in <b>Chapter 6: Climate</b> of the ES [EN010118/APP/6.1], and within the Flood Risk Assessment (FRA), presented in <b>Appendix 9A</b> of the ES.
<b>Fire</b>	Local residents, habitats and species.	If there is a malfunction to one of the battery arrays, there is a range of integrated controls that will activate depending on the extent and severity of the event. In case the malfunction progresses to a catastrophic fire event and so long as there are no lives under threat, the fire brigade would ensure surrounding elements and structures (intact battery arrays nearby, other electrical equipment, trees etc.) are kept adequately wet and cool to prevent the fire from expanding any further but the battery infrastructure may be allowed to burn within the controlled area. There is a potential fire risk associated with certain types of batteries such as lithium ion. An Outline Battery Safety Management Plan (BSMP) has been prepared and is provided with the Application.
<b>Road accidents</b>	Aquatic environment Road users	An assessment of accidents and safety is presented in <b>Chapter 13: Transport and Access</b> of the ES [EN010118/APP/6.1]. With regard to Hazardous and Dangerous Loads, the analysis of the road network within the study area indicates that there are no particular features, such as a significant vertical drop immediately beyond the carriageway, which would suggest that the transfer of materials poses a particular risk beyond that which would be expected on the general highway network. The transport of the battery cells are not considered a risk; in accordance with good practice and legislation the vehicle would include a road handling label so emergency response teams to any road traffic accident would be aware of the vehicle contents, and the handler would adhere to the Dangerous goods regulations. It is concluded that

Major Accident or Disaster	Potential receptor	Comments
		<p>no further assessment on hazardous loads is required in <b>Chapter 13: Transport and Access</b> of the ES [EN010118/APP/6.1]. The risk posed by chemical spillage during construction or decommissioning is considered in <b>Chapter 9: Flood Risk, Drainage and Surface Water</b> of the ES [EN010118/APP/6.1]. The Glint and Glare Assessment presented in <b>Appendix 10G: Glint and Glare Assessment</b> of the ES [EN010118/APP/6.2] identifies that with the proposed embedded design mitigation and the additional mitigation in the form of hedgerows, <b>no significant residual effects</b> from glint and glare are anticipated as a result of the Scheme, including effects to road users and residential receptors.</p>
<b>Rail accidents</b>	Rail Users	<p>The Glint and Glare Assessment presented in <b>Appendix 10G: Glint and Glare Assessment</b> of the ES identifies that with the proposed embedded design mitigation and the additional mitigation in the form of hedgerows, <b>no significant residual effects</b> from glint and glare are anticipated as a result of the Scheme.</p> <p>The site is located adjacent to the railway line connecting Chelmsford to Colchester. <b>No significant effects</b> from glint and glare are predicted on rail receptors. Glint and glare effects will be negligible on local road users and at residential dwellings, and therefore <b>not significant</b>.</p>
<b>Aircraft disasters</b>	Pilots and aircraft	<p>Section 6.142 of the Glint and Glare Assessment presented in <b>Appendix 10G:</b> of the ES identifies that the impact on aviation assets is <b>not significant</b>.</p>
<b>Flood defence failure</b>	Employees	<p>No development or solar PV panels will be located within flood risk areas; therefore, flood risk is not increased to the development or elsewhere. This is considered in <b>Chapter 9: Flood Risk, Drainage and Surface Water</b> of the ES and in <b>Appendix 9A: FRA</b> of the ES.</p>
<b>Utilities failure (gas, electricity, water, sewage, oil, communications)</b>	Employees and local residents	<p>The Scheme has the potential to affect existing utility infrastructure above and below ground. To identify any existing infrastructure constraints, both consultation and a desk-based study has been undertaken. It is known that there is an overhead electricity line located within the Order limits.</p>
<b>Mining / Extractive Industry</b>	Employees	<p>There is the potential for current or past quarrying activity in the vicinity to lead to unstable ground conditions due to nearby active quarries. However, the risk has been considered as part of the geotechnical design, ensuring that the risk is designed out.</p>
<b>Plant Disease</b>	Habitats and species	<p>New planting may be susceptible to biosecurity issues, such as the increased prevalence of pests and diseases, due to climate change. The planting design will take account of biosecurity risks through a wider mix of species including some non-natives. Further information on proposed planting is presented in <b>Chapter 10: Landscape and Visual Impact Assessment</b> [EN010118/APP/6.1], the OLEMP and <b>Figure 10-12</b> of the ES.</p>

- 16.4.15 It is considered that the presence of the Scheme would not make heritage assets any more vulnerable to those accidents or disasters as identified for consideration in the ES chapter, than they would be if the Scheme was not in place.
- 16.4.16 Those major accidents and disasters listed in Table 16-9 that are not being considered within another technical assessment (fire) have been reviewed by the design team to ensure risks are addressed through the design as necessary. These events are assessed below.
- 16.4.17 Where there is potential for interaction between a major accident and disaster, receptor, and the Scheme, these have been shortlisted (see **Table 16-9**) and a qualitative evaluation is provided below. An effect is considered significant based on the effect it would have on the environment, as a result of the assessed accident or disaster occurring as a result of the Scheme. Details on appropriate prevention measures and mitigation for significant effects on the environment from such events are either provided in the sections below or within the referenced topic chapters.

### **Baseline Conditions**

- 16.4.18 A number of receptors are present in the vicinity of the Scheme which could be vulnerable to major accidents or disasters, either because of their proximity to the Scheme or their importance to the surrounding area. These include:
- Towns, villages, farms and residential homes;
  - Commercial sites and buildings;
  - Roads;
  - Railways;
  - Designated ecological sites, woodland, farmland, and waterbodies; and
  - Underground infrastructure services including electricity, water, communications, and gas.
- 16.4.19 Details of the specific receptors that fall into the above categories are provided in **Chapter 2: The Scheme** of the ES [EN010118/APP/6.1]. These receptors have been considered in this assessment. In the absence of the Scheme, the future baseline is anticipated to remain the same.

### **Assessment of Potential Effects**

#### **Construction and Decommissioning Phase**

- 16.4.20 Risks of major accidents and disasters occurring during construction and decommissioning are assessed in the relevant chapters outlined in **Table 16-9**. All works will be subject to risk assessments as required by the Outline CEMP (**Volume 7** of the ES [EN010118/APP/7.10]) and the Decommissioning Strategy (**Volume 7** of the ES [EN010118/APP/7.12]). Mitigation measures to be implemented during construction and decommissioning are listed within the Outline CEMP and the Decommissioning Strategy respectively, which will be secured by requirements in the DCO.
- 16.4.21 As described in **Chapter 2: The Scheme** of this ES, National Grid Electricity Transmission (NGET) may undertake maintenance works and restringing of

the overhead lines within the Order limits during construction of the Scheme. To provide safe access the Applicant will delay installation of solar PV within the working corridor beneath these overhead lines or, if already installed, temporarily remove panels to allow NGET to carry out this work safely.

#### *Utilities failure (gas, electricity, water, sewage, oil, communications)*

16.4.22 Electrical cables are required to connect generating and storage components with electricity management infrastructure within the Solar PV Array Areas and BESS before connecting to the Longfield Substation. This will include an underground diversion of existing overhead lines adjacent to Stocks Farm and a temporary diversion as part of the Bulls Lodge Substation Extension. These works are subject to a risk assessment as set out in the outline CEMP.

#### *Fire*

16.4.23 Health and Safety on site would be managed by the contractor during construction and decommissioning to mitigate the risk of fire in line with legislative safety requirements. An Outline Battery Safety Management Plan (BSMP) has been prepared and is provided with the application. The implementation of the Outline BSMP will be secured by a requirement to the DCO. The Outline CEMP and the Decommissioning Strategy also include measures to reduce risk of fire during construction and decommissioning, secured by a requirement to the DCO. During construction and decommissioning, the Scheme is not expected to have an effect on the environment due to the risk of a major accident occurring as a result of fire during construction and decommissioning.

#### *Plant Disease*

16.4.24 The planting strategy for the Scheme has been developed to use native species as described in the Outline LEMP of the ES. It is not proposed that planting is removed during decommissioning of the Scheme.

#### Operational Phase

16.4.25 An Outline Operational Environmental Management Plan (OEMP) has been prepared to manage environmental risks during operation. This is provided in **Volume 7** of the ES [EN010118/APP/7.11]. The approval and implementation of the OEMP will be secured by a requirement to the DCO.

#### *Fire*

16.4.26 There is a potential fire risk associated with certain types of batteries such as lithium ion. An Outline Battery Safety Management Plan (BSMP) has been prepared and is provided with the application. The implementation of the Outline BSMP will be secured by a requirement to the DCO. This fully considers the risks associated with fires from BESS equipment and minimises the impact of an incident during construction, operation, and decommissioning, and includes the following:

- a. Details of the hazards associated with lithium-ion (li-ion) batteries;
- b. Isolation of electrical sources to enable firefighting activities;
- c. Measures to extinguish or cool batteries involved in fire;
- d. Minimise environmental impact of an incident;



- e. Containment of fire water run-off;
- f. Handling and responsibility for disposal of damaged batteries; and
- g. Establishment of regular onsite training exercises.

16.4.27 A summary of the anticipated site-wide fire safety provisions provided in the Outline Battery Safety Management Plan (BSMP) are as follows:

- a. Designed and installed in accordance with international good practice and related standards;
- b. Risk assessments will be undertaken for the entire system and elements across the project lifecycle;
- a. The selected location for the BESS as shown on the Concept Design and specified within the Outline Design Principles, has sought to minimise the proximity to receptors of any nuisance with the distance to properties maximised where possible, and as such the BESS is around 500m from any properties. It also incorporates sufficient separation distance between components to prevent any fire spreading;
- c. Equipment will, where possible, be selected to be fire limiting, such as selection of transformer oils with low flammability and the fire resistance of the Energy Storage System enclosure;
- d. In the case of the Energy Storage System; designed with multiple layers of protection to minimise the chances of a fire or thermal runaway;
- e. All equipment will be monitored maintained and operated in accordance with manufacturer instructions;
- f. Energy Storage System will be integrated with fire detection with automated suppression systems;
- g. 24h monitoring of the system via a dedicated control room;
- h. The Applicant will have a dedicated emergency plan in place, which will be prepared following receipt of the DCO; and
- i. Communication with the local fire services with engagement early in the project and continuing across design and construction phases.

16.4.28 A BESS Plume Assessment has been produced by the Applicant and is presented in the Battery Safety Management Plan. This document provides an assessment of the potential worst case credible air quality impacts of a fire incident at the BESS. The assessment has been based on a 400MW x 4 hour BESS, which forms the Concept Design. The design of the BESS may change at detailed design stage, when a decision is made to select a supplier, product, and battery chemistry. Any selection made will be compliant with the Rochdale envelope principles listed within Work No.2 of the Outline Design Principles [EN010118/APP/7.3]. The Applicant will update the Battery Safety Management Plan and BESS Plume Assessment at detailed design stage to reflect the chosen technology, which would be shared with the council(s) and the local fire service for approval prior to construction of the BESS. Technology will only be selected if it shows to produce a plume which is the same or less harmful than the LFP (Lithium Iron Phosphate) technology which has been selected as the concept design, and modelled at time of DCO submission.

There are several safety measures to prevent a fire if a defect occurs, but the assessment has assumed none of these are successful and is therefore to overestimate the impact associated with a fire.

- 16.4.29 A number of credible worst case scenarios have been developed and modelled for the Concept Design battery system. These scenarios are typically the release of toxic gas(es), a fire event, and or an explosion from the ignition of gasses, or a combination thereof. For these to occur, a number of failures of protection systems would have to occur before and during the event. i.e., cell and module monitoring systems, system monitoring and gas detection systems.
- 16.4.30 The findings of the study have shown that the worst case impact of a toxic release varies dependent upon the prevailing wind direction and speed. The only toxic gas with the potential to extend beyond the site boundary is hydrogen fluoride (HF). The concentration of HF is predicted not to exceed the safe limits at any properties under worst case conditions (three times lower than the safe level). Therefore, the likely impact on the general public, particular nearby residents is deemed to be very low.
- 16.4.31 Smoke may also accompany the toxic gas release, and an Emergency Response Plan will be prepared post consent to ensure protocols are in place for notifying local residents should they be advised to stay indoors, keep windows shut, or not exercise outdoors (as secured by the OEMP). It is anticipated that the emergency response would take no more than a few tens of minutes, however the precise procedure and response time will be finalised post consent.
- 16.4.32 In the more unlikely scenario there is an unconfined explosion, following several successive technology failures, the worst case modelling scenario shows the explosion would be limited to slightly under 20m from the affected cell. There are no PRoW, public access, or properties within this distance.
- 16.4.33 In addition to the above, a Fire Service Site Specific Risk Assessment has been produced for the BESS. The implementation of this is secured via a requirement to the DCO.
- 16.4.34 With the above embedded mitigation, the risk of fire or explosion is minimised and would be very low. In the event it did occur, the concentration of pollutants is predicted not to exceed the safe limits at any properties under worst case conditions. Therefore, the likely impact on the general public, particular nearby residents is deemed to be very low and no significant effect on the environment and people from a major accident is anticipated.

### ***Plant Disease***

- 16.4.35 The establishment, monitoring and protection of the Advanced Mitigation Planting, Construction Day 1 Planting, and Residual Mitigation Planting, and its management, is set out within the Outline Landscape and Ecological Management Plan (OLEMP).

### ***Mitigation Measures***

- 16.4.36 Minimising the risk of major accidents during construction, operation, and decommissioning will be addressed through appropriate risk assessments as

required in the Outline CEMP, OEMP, and Decommissioning Strategy. The implementation of those plans will be secured via a requirement to the DCO.

- 16.4.37 An Outline Battery Safety Management Plan (BSMP) has been produced for the Scheme and will be updated and maintained as a 'live document' throughout the operational phase of the Scheme. The implementation of the strategy will be secured via a requirement to the DCO.

### **Residual Effects**

- 16.4.38 Given the nature of accidents and disasters, there is the potential for significant effects if an event does occur, however, the assessment has concluded that the risk of such events occurring is low for the Scheme, and significant effects on the environment are therefore not anticipated. On the rare occasion that a major accident and disaster does occur, the significance of the effect would correlate to the scale of the major accident and disaster event. The focus is on prevention of major accidents and disasters, and mitigation if an event does occur. Taking into account the good industry practice and additional mitigation measures discussed above, the risk of accidents and disasters is considered low. However, the assessment has concluded that the risk of such events occurring is low for the Scheme. The assessment has considered the likely effects resulting from an event, should one occur, and has concluded there would be no significant effects on the environment or people.

### **Cumulative Effects**

- 16.4.39 Increased traffic during construction and decommissioning phases of the Scheme in combination with other developments could result in a greater risk of road accidents in combination. This is assessed in **Chapter 13: Transport and Access** of the ES [EN010118/APP/6.1].
- 16.4.40 With embedded mitigation and additional mitigation listed above to reduce the risk of fire and other shortlisted events included in **Table 16-9**, it is not expected that any cumulative schemes would increase the risk or severity of the residual effects associated with major accidents and disasters affecting the Scheme.

## **16.5 Telecommunications, Television Reception and Utilities**

### **Introduction**

- 16.5.1 This section evaluates the effects of the Scheme on telecommunication infrastructure, television reception and existing utilities.

### **Relevant Legislation, Guidelines and Policy**

- 16.5.2 Effects relating to existing infrastructure are not environmental effects and there is no requirement to include an assessment of these effects under the EIA Regulations (Ref 16-34). However, given the nature of solar park developments, they have the potential to affect existing utility infrastructure above and below ground.

## Consultation Responses

16.5.3 Consultation responses in relation to telecommunications, television reception, and utilities are summarised in **Table 16-10**.

**Table 16-10: Consultations matters and responses for Telecommunications, Television Reception and Utilities**

Consultee	Matter raised	Response
Planning Inspectorate	The Applicant proposes that an assessment of impacts on Telecommunications, Television Reception and Utilities is presented as part of an 'Other Environmental Issues' chapter of the ES. The Inspectorate agrees with this approach and is content that any significant effects that arise from impacts on telecommunications, television reception and utilities can be assessed within the 'Other Environmental Issues' chapter of the ES.	Information on Telecommunications, Television Reception and Utilities is presented in this section.
Planning Inspectorate	It should be clear how the results of the desk study and consultation have informed the layout of the Proposed Development. Should any diversions of utility or telecommunications infrastructure be required, these should be described in the ES and any resultant likely significant effects should be assessed.	Alternative designs and design evolution are presented in <b>Chapter 3: Alternatives and Design Evolution</b> of the ES [EN010118/APP/6.1]  Utilities diversions are included in <b>Chapter 2: The Scheme</b> of the ES. The Outline CEMP provides good practise and mitigation measures to reduce potential impacts as a result of utility diversions.

## Assessment Methodology

16.5.4 To identify any existing infrastructure constraints, both consultation and a desk-based study will be undertaken prior to construction. Consultation with relevant telecommunication and utilities providers is a routine part of solar development.

16.5.5 Consultees include water, gas and electricity utilities providers and telecommunications providers. Telecommunications and television providers are unlikely to be affected by Electromagnetic Interference (EMI) unless transmitters are near electrical infrastructure associated with the solar PV array (Ref 16-58).

16.5.6 A desk-based search has been undertaken for the presence of telecommunications, television reception and utilities infrastructure within the Order limits and within the vicinity. A qualitative approach undertaken by

competent experts is used to assess the likelihood of significant effects on telecommunications, television reception and utilities.

16.5.7 The assessment of effects on telecommunications, television, and radio is based on the maximum parameters set out by the Design Principles. This includes the maximum depth of construction activities and infrastructure, the maximum area allowed to be disturbed during construction and developed by the Scheme, and the maximum heights and massing allowed by the application.

### ***Baseline Conditions***

#### Telecommunications

16.5.8 There are several mobile phone masts present with the Order limits.

#### Television Reception

16.5.9 The area surrounding the Scheme receives television signals from the Chelmsford DAB transmitter.

#### Utilities

16.5.10 Consultation has been and will continue to be undertaken with the following organisations:

- a. National Grid Electricity Transmission Plc;
- b. National Grid Gas;
- c. Canal and River Trust;
- d. BT Ltd
- e. Cadent Gas Ltd.
- a. ESP Utilities Group Ltd;
- b. Essex and Suffolk Water Ltd;
- c. UK Power Networks Group (Trustee) Ltd;
- d. Gigaclear Ltd;
- e. AWG Group Ltd;
- f. Lumen Technologies UK Ltd;
- g. CityFibre Ltd;
- h. Colt Technology Services;
- i. ENGIE Gas Ltd;
- j. GTG Infrastructure Ltd;
- k. Mobile Broadband Network Ltd;
- l. Utility Assets Ltd;
- m. Edgecast Ltd;
- n. Virgin Media Ltd; and
- o. Vodafone Ltd.

16.5.11 On-site utilities could include water, sewers, gas or oil pipelines and electrical cables. Knowledge of the utilities during design and construction allows any effects to be negated by avoiding them or by use of suitable structures, such as pipe bridges.

16.5.12 Through consultation and a desk-based search of existing datasets, the following utilities and infrastructure that have the potential to be affected by the Scheme have been identified:

- a. Electricity Lines;
- b. Electricity transmission lines and pylons;
- c. Overhead lines;
- d. Gas pipelines;
- e. Buried cables; and
- f. Water mains, resource mains or discharge pipes.

### ***Assessment of Potential Effects***

#### **Telecommunications**

16.5.13 The Scheme is unlikely to interfere with telecommunications infrastructure and therefore no effects are anticipated in the construction, operation, and decommissioning phases. In any event, the DCO will include the standard protective provisions for the protection of telecommunications operators, so measures will be in place for the protection of telecommunications infrastructure.

#### **Television Reception**

16.5.14 The Scheme consists of fixed low-lying infrastructure and is therefore unlikely to interfere with digital television signals and therefore no effects are anticipated in the construction, operation and decommissioning phases.

#### **Utilities**

16.5.15 The potential exists for utilities to be affected during the construction of the Scheme through damage caused as a result of excavation and engineering operations. Without any precautionary measures to avoid damage to utilities, this could lead to a short-term adverse effect.

16.5.16 Precautionary measures have been included as part of the embedded mitigation for the Scheme, which included developing the detailed design of the Scheme having regard to utilities protected zones; the use of ground penetrating radar before excavation to identify any unknown utilities (secured through the Outline CEMP; and the inclusion of protective provisions in the DCO which ensure appropriate protections are in place for assets, and allows for consultation with utility undertakers where works may affect their assets prior to works commencing. These measures, along with those listed within the CEMP, would reduce the likelihood of effects on utilities during construction. Therefore, no adverse effects are expected during construction.

16.5.17 The decommissioning phase would require below ground works to remove the cables within the Solar Farm Site, but the Grid Connection Route Cables would remain in situ; however, works would be undertaken within the footprint

excavated during construction. Additionally, the embedded mitigation measures used during construction would also apply during decommissioning. Therefore, no adverse effects are predicted during decommissioning.

- 16.5.18 No effects on utilities are predicted as a result of the operational phase of the Scheme because no below-ground works will be required during operation. The Scheme includes the undergrounding of a short section of 33kV OHL adjacent to Stocks Farm [Figure 2-32] during the construction period. The protective provisions would remain in place throughout operation, for the protection of utility assets.

### **Mitigation Measures**

- 16.5.19 The risk of damage to utilities during construction would be minimised through embedded mitigation, which would involve those measures listed above and mapping infrastructure that crosses the Scheme and avoiding it through the design. The draft DCO also includes protective provisions for the protection of electronic communication networks and utilities, and engagement with relevant statutory undertakers in this respect is ongoing. No additional mitigation is required.

### **Cumulative Effects**

- 16.5.20 The Scheme has been assessed to have no effect on telecommunication, television or utilities. It is expected that the other solar developments included within the cumulative schemes shortlist would also have no effect on telecommunications and television reception and would adhere to the same mitigation as set out above to reduce the risk of damaging utilities. Therefore, no cumulative effects are expected on telecommunications, television reception, or utilities.

## **16.6 Waste**

### **Introduction**

- 16.6.1 This section discusses the expected waste streams during each phase of the Scheme, and assesses the likely significant effects that may arise from waste as a result of the Scheme. The legal definition of waste is “*any substance or object which the producer discards or intends or is required to discard*”<sup>1</sup>.
- 16.6.2 The legal definition of waste also covers substances or objects, which fall outside of the commercial cycle or out of the chain of utility. In particular, most items that are sold or taken off site for recycling are wastes, as they require treatment before they can be resold or reused.
- 16.6.3 In practical terms, wastes include surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment and materials.

### **Relevant Legislation, Guidelines and Policy**

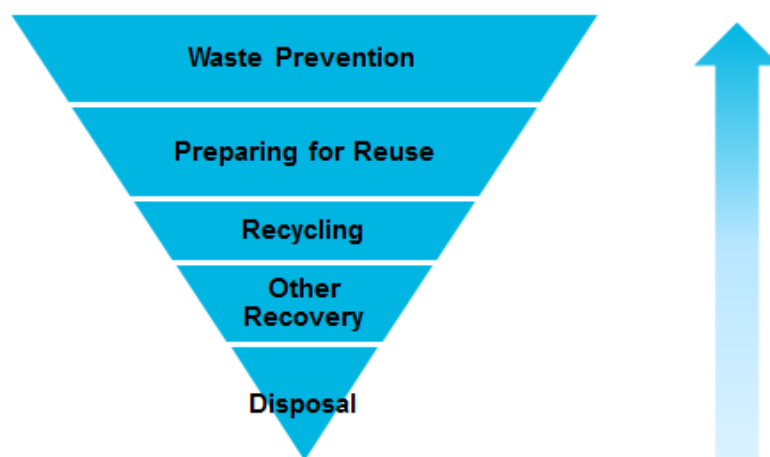
- 16.6.4 The Waste Framework Directive 2008/98/EC (Ref 16-55) provides a framework for the management of waste across the European community. The revised Directive (2018) (Ref 16-56) introduced new provisions in order to

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<sup>1</sup> Guidance on the legal definition of waste and its application, DEFRA 2012

boost waste prevention and recycling as part of the Waste Hierarchy. All Member States of the EU are required to adopt this approach.

- 16.6.5 The Waste (England and Wales) Regulations 2011 (as amended) (Ref 16-57) transposed the Waste Framework Directive 2008/98/EC into domestic law in England and Wales and require waste prevention programmes and waste management plans that apply the Waste Hierarchy. The main principles of the Waste Hierarchy are summarised in Plate 16-1.
- 16.6.6 The Waste Hierarchy will be adopted throughout the construction, operation and decommissioning phases of the Scheme.



**Plate 16-1: The Waste Hierarchy**

- 16.6.7 The requirement originally under Section 34 of the Environmental Protection Act 1990 (Ref 16-51) and in the Waste (England and Wales) Regulations 2011 (Amended 2014) places a duty on producers and holders of waste to:
- Prevent illegal disposal, treatment or storage of waste;
  - Handle their waste safely;
  - Know whether the waste is hazardous or non-hazardous;
  - Store waste securely in a manner that prevents release of the waste;
  - Provide an accurate written description of the waste in order to facilitate the compliance of others with the Duty and avoidance of the offences under Section 33 of the Environmental Protection Act 1990: via a compulsory system of Controlled Waste Transfer Notes (WTNs) which controls the transfer of waste between parties; and
  - Ensure anyone dealing with their waste has the necessary authorisation.
- 16.6.8 The Hazardous Waste Regulations (England and Wales) 2005 (amended in 2016) (Ref 16-53) places a requirement on the producer of the waste to:
- Classify the waste;
  - Separate hazardous waste from other general waste streams;
  - Use authorised businesses to collect, recycle or dispose of your waste; and



- d. Complete relevant hazardous waste consignment note.
- 16.6.9 Under the Control of Pollution Act 1974 (as amended) (Ref 16-54), it is a criminal offence for anyone not registered as a carrier, to transport Controlled Waste.
- 16.6.10 Once appointed, details of the waste carriers and contractors will be included in the Construction Resource Management Plan (CRMP) including copies of appropriate licences. Waste carrier licences will be reviewed prior to works commencing. The CRMP will be finalised prior to the start of construction, pursuant to the CEMP.
- 16.6.11 Paragraph 5.15.7 of the Draft National Policy Statements (EN-1) states: *“Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible”*. This is considered in this Section 16.6 and will be further addressed in the CRMP. Details of waste management are also provided in the Outline CEMP.
- 16.6.12 From January 2014, anyone undertaking the following activities as part of their business must register as a waste carrier, broker or dealer to (Ref 16-67):
- Transport their own waste;
  - Transport or dispose of waste for someone else;
  - Buy or sell waste; or
  - Act as a waste broker (arrange for someone to handle other people’s waste).
- 16.6.13 Essex and Southend-on-Sea Waste Local Plan 2017 (Ref 16-67) has been prepared to help ensure that all types of waste arising in Essex and Southend, now and in the future, are managed in a way which is least damaging to the environment and helps maintain the best possible quality of life for residents. The waste planning policies found in the local plan provide up-to-date planning policy for waste development in Essex and Southend-on-Sea until 2032.

### Consultation Responses

- 16.6.14 Consultation responses to the EIA Scoping Report are summarised below in **Table 16-11**.

**Table 16-11: Consultation matters and responses for Waste**

Consultee	Matter raised	Response
Planning Inspectorate	The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be	Information on waste management is presented in the Outline CEMP  Information on the type and quantity of waste is presented in <b>Chapter 6: Climate Change</b> the ES.

Consultee	Matter raised	Response
	integrated into the relevant aspect assessments.	A summary of waste management is provided in this section.
<b>Planning Inspectorate</b>	<p>The Inspectorate agrees that a standalone chapter on waste is not required in the ES and that the description of the potential streams of construction waste and estimated volumes can be included in the ES description of development chapter. A similar description and estimates should be provided in respect of decommissioning. The ES should assess any impacts resulting from the transport of waste generated during construction and decommissioning of the Proposed Development which are likely to result in significant effects. Any assumptions made (such as with regard to quantities of contaminated material) should be clearly set out and justified in the ES. In addition, the ES should describe any measures implemented to minimise waste and state whether the waste hierarchy will be utilised. The Outline CEMP should include as much detail as possible on on-site waste management, recycling opportunities and off-site disposal.</p>	<p>Information on waste management is presented in the Outline CEMP and Decommissioning Strategy and also in <b>Chapter 2: Scheme Description</b> of the ES</p> <p>Information on the type and quantity of waste is presented in <b>Chapter 6: Climate Change</b> the ES.</p> <p>A summary of waste management is provided in this section. <b>Chapter 13: Transport and Access</b> of the ES assesses the impacts of transporting waste from the Order limits during construction and decommissioning.</p>
<b>Essex County Council</b>	<p>With reference to Table 14.1, it is stated at Row 6 (Waste) that “Waste materials will be disposed of by the contractor(s) to appropriate recycling facilities or appropriately licensed landfills in line with a Construction Resource Management Plan (equivalent to a Site Waste Management Plan)”. This is supported. Information within or accompanying the ES should also quantify the volumes of waste re-used on site and leaving the site, as well as demonstrate how the amount of waste forecasted to leave the site has been proactively minimised at construction, operation and deconstruction stages by incorporating sustainable working practices, including a consideration of the material used and their procurement. Waste arising from the site should be assessed in light of the available capacity to manage it where such an assessment can be made.</p>	<p>Noted. Information on waste management is presented in the Outline CEMP and summarised in this section.</p> <p>A CRMP will be prepared by the Contractor, which will specify the waste streams to be estimated and monitored and goals set with regards to the waste produced. The CRMP will be finalised with specific measures to be implemented prior to the start of construction, in accordance with the CEMP, which is secured via a DCO Requirement.</p>

Consultee	Matter raised	Response
<b>Essex County Council</b>	We would prefer that minerals and waste matters were considered as part of a standalone chapter, contrary to paragraph 14.9.4, even if this mainly serves to signpost other relevant documents.	A Minerals Safeguarding Assessment has been prepared [EN010118/APP/7.7], and the Planning Statement will also address minerals matters.
<b>Essex County Council</b>	That aside, paragraph 14.9.1 states that “A description of the potential streams of construction waste and estimated volumes will be described within the description of development chapter of the ES” but that “the CEMP, which would be produced following receipt of a DCO, will set out how waste will be managed on-site, and opportunities to recycle waste will be explored”. It is questioned how the ES can comment on volumes of waste arising ahead of the consideration of how waste will be managed on-site and recycling opportunities explored. Those issues set out to be assessed following DCO consent should instead be addressed as part of the Outline CEMP and submitted at the same time as the ES such that the description of development chapter of the ES is suitably informed.	Noted.  Information on the type and quantity of waste is presented in <b>Chapter 6: Climate Change</b> the ES.  The Outline CEMP outlines measures to manage recycling and the disposal of waste.

### Assessment Methodology

- 16.6.15 Waste streams and quantities have been estimated using industry standards, based on activities, material requirements and staff requirements during the construction, operation and decommissioning phases. This is considered in relation to the waste hierarchy minimising, reducing and re-use of waste as appropriate.
- 16.6.16 The assessment of effects on waste is based on the maximum parameters set out by the Design Principles. This includes the maximum depth and area allowed to be disturbed during construction and developed by the Scheme, along with the maximum number, locations, and surface area of Scheme infrastructure.

### Baseline Conditions

- 16.6.17 The commercial nature of the waste to be produced during both construction, operation and decommissioning will mean it will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements. The waste carriers and landfill sites used will be determined by the contractor pre-construction. Quantities of construction waste arisings have been estimated, as these will be based on a number of factors that include construction methodologies and the nature of the materials used. Waste quantity estimates are presented in **Chapter 6: Climate Change** of the ES.

### Assessment of Potential Effects

16.6.18 Given the nature of the Scheme, significant quantities of waste are not anticipated. Expected waste streams during the construction, operation and decommissioning phases are discussed below.

16.6.19 A detailed Construction Resource Management Plan (CRMP), CEMP, Decommissioning Environmental Management Plan (DEMP) and Decommissioning Resource Management Plan (DRMP) will be prepared for the construction and decommissioning phases. An Outline CEMP and Decommissioning Strategy have been submitted with the DCO application. These include measures to control and manage waste on-site. These will be secured through a DCO Requirement.

#### Construction Phase

16.6.20 A description of the potential streams of construction waste and estimated volumes are included within **Chapter 6: Climate Change** of the ES. In addition to this, the detailed CEMP, which would be produced following receipt of a DCO, will set out how waste will be managed on-site, and opportunities to recycle waste will be explored.

16.6.21 The majority of construction equipment will be delivered to site for assembly and installation (mounting structures) and connection (solar panels).

16.6.22 A Waste Infrastructure Impact Assessment [**EN010118/APP/7.9**] has been prepared for the application, which concludes that the Scheme would not experience significant adverse effects as a result of the ongoing operations at Boreham Recycling Centre or Bulls Lodge Inert Recycling, nor significantly affect these existing operations. No traffic associated with the Scheme will use the section of Waltham Road south of Boreham Recycling Centre and there will be no impact on the capacity of Boreham Interchange. Overall, it therefore follows that the Scheme complies with Policy 2 (Safeguarding Waste Management Sites and Infrastructure) of the Essex and Southend-on-Sea Waste Local Plan (2017), and Policy S5 of the Essex Minerals Local Plan which requires that development proposals for non-waste development within Waste Consultation Areas (WCAs) do not adversely impact on the operation of safeguarded waste sites or infrastructure, including site allocations.

16.6.23 The types of waste streams and vehicles associated with the removal of waste material during construction is summarised in **Table 16-12**.

**Table 16-12: Waste arisings during construction**

Waste	Destination
Metals (aluminium, iron and steel)	Recycling or recovery of metals and metal components
Mixed construction / demolition wastes that do not contain hazardous substances	Recycling plant / Landfill for Construction and Demolition Waste
Cables that do not contain hydrocarbons, coal tar or other hazardous substances	Recycling plant
Plastic	Recycling plant

Waste	Destination
Paper and cardboard containers	Recycling plant
Wood	Recycling plant
Absorbents, cleaning cloths	Authorised recycling plant or authorised landfill for hazardous waste
Aerosol sprays	Authorised recycling plant or authorised landfill for hazardous waste
Land and stones containing hazardous substances	Authorised recycling plant or authorised landfill for hazardous waste
Empty containers of contaminated metal or plastics	Authorised recycling plant or authorised landfill for hazardous waste
Used oils	Authorised recycling plant or authorised landfill for hazardous waste
Oil filters	Authorised recycling plant or authorised landfill for hazardous waste

16.6.24 All waste transported off site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Scheme will be subject to their own consenting procedures.

16.6.25 Prior to construction, opportunities to minimise waste produced through the construction phase as far as possible will be explored. Possibilities to re-use or recycle materials will be explored before resorting to landfill options.

16.6.26 Solid waste materials generated during construction will be segregated and stored onsite in containers of up to 30m<sup>3</sup> capacity prior to transport to an approved, licensed third party landfill and recycling facilities. During construction removal of waste is estimated to require approximately 330 HGV loads over a period of 12 months, which equates to an average of 1 load per day. These traffic movements have been assessed in **Chapter 13: Transport** of the ES.

16.6.27 Re-usable waste includes soil excavated for trenches, roads, compound areas and foundations. These will be re-used on-site where possible.

16.6.28 Toxic and/or hazardous waste must be treated by an authorised operator. Transportation of hazardous waste will also require an authorised carrier. Materials are to be dealt with in accordance with the CEMP and CRMP which will be secured through a DCO Requirement. With these in place and the appropriate control measures followed, no significant effects are anticipated.

### Operational Phase

16.6.29 During the operational phase of the Scheme there will be up to eight permanent staff, although given the scale of the Scheme maintenance personnel would be expected to be present on-site most days. Waste arisings are expected to be minimal, and would include:

- a. Welfare facility waste;
- b. Equipment needing replacing;
- c. Waste metals; and
- d. General waste (paper, cardboard, wood, etc.).

16.6.30 During the operational phase of the Scheme, waste arisings are expected to be minimal and as they would be considered to be commercial waste this will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements. It is therefore not anticipated to result in a significant impact. Details of how waste during operation will be dealt with are provided in the Outline OEMP. The implementation of the OEMP is secured by DCO requirement.

#### Decommissioning Phase

16.6.31 It is expected that waste streams during decommissioning could include:

- a. Solar panels and mounts;
- b. Waste materials from foundations;
- c. Electrical equipment;
- d. Batteries;
- e. Cables;
- f. Welfare facility waste;
- g. Waste chemicals, fuels and oils;
- h. Waste metals;
- i. Waste water from dewatering of excavations; and
- j. Waste water from cleaning activities (e.g. wheelwash).

16.6.32 The Solar PV Arrays and related components, Ancillary Infrastructure, Longfield Substation, and the BESS Compound will be removed and recycled or disposed of in accordance with good practice and market conditions at that time.

16.6.33 The underground cable within the Grid Connection Route would be either left in-situ or removed and the ground reinstated.

16.6.34 The effects of decommissioning are similar to, or often of a lesser magnitude than construction effects and will be considered in the relevant sections of the ES. However, there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies are likely to change over the operational life of the Scheme.

16.6.35 All waste transported off site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Scheme will be subject to their own consenting procedures. It is worth noting that it is not possible to forecast the capacity of the landfill sites for decommissioning at this stage due to potential change in waste generation and operators at that time.

16.6.36 Removal of waste is estimated to require approximately 2,457 HGV loads over a period of 12 months, which equates to an average of 6 loads per day, as set out in **Chapter 13: Transport and Access** of the ES.

16.6.37 Prior to decommissioning, opportunities to minimise waste as far as possible will be explored. Possibilities to re-use or recycle materials will be explored before resorting to landfill options. There is a new industry emerging for recycling solar panels. This would be explored, in addition to any resale of any operational panels. Waste during the decommissioning phase will be dealt with as part of the Decommissioning Strategy, and in line with relevant legislation and guidance at that time. Therefore, the effect is anticipated to be **not significant**.

### **Mitigation Measures**

16.6.38 As part of the embedded mitigation, a detailed CEMP and DEMP will be secured through a DCO requirement, prior to the commencement of construction and decommissioning phases.

16.6.39 Waste arisings will be prevented and designed out where possible. Opportunities to re-use material resources will be sought where practicable. Where re-use and prevention are not possible, waste arisings will be managed in line with the Waste Hierarchy and detailed CRMP.

### **Cumulative Effects**

16.6.40 A long list of cumulative schemes is presented in **Appendix 5A** of the ES [EN010118/APP/6.2]. Cumulative effects may occur from increased HGVs transporting waste to recycling plants and landfill. This is assessed in **Chapter 13: Transport and Access** of the ES. The Essex and Southend-on-Sea Waste Plan considers waste needs up to 2035 and considers allocated sites and other forms of strategic development therefore consideration has been made at the regional level for the cumulative waste generated by these schemes. It is also assumed that each of the cumulative schemes will also be considering and implementing the waste hierarchy. Therefore, no significant effects cumulative are anticipated.

## 16.7 References

- Ref 16-1 Department for Environment, Food and Rural Affairs (Defra) (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.
- Ref 16-2 H.M. Government (2000). The Air Quality Standards Regulations (2000).
- Ref 16-3 H.M. Government (2010). The Air Quality Standards Regulations 2010.
- Ref 16-4 H.M. Government (2016). The Air Quality Standards (Amendment) Regulations 2016.
- Ref 16-5 Department for Environment Food and Rural Affairs (Defra) (2019). Clean Air Strategy.
- Ref 16-6 H.M. Government (1972). European Communities Act 1972
- Ref 16-7 H.M. Government (2018). European Union (Withdrawal) Act 2018.
- Ref 16-8 European Parliament, Council of the European Union (2008). Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe, 21 May 2008.
- Ref 16-9 Air Quality News (2011). Pippa Neill – (Article) Top court confirms UK has broken air pollution law. – The UK has '*systematically and persistently exceeded legal limits for nitrogen dioxide since 2010*'.
- Ref 16-10 Ministry of Housing, Communities & Local Government (2019). National Planning Policy Framework.
- Ref 16-11 Ministry of Housing, Communities & Local Government (2019). Planning Practice Guidance: Air Quality.
- Ref 16-12 H.M. Government (2010). The Conservation of Habitats and Species Regulations 2010.
- Ref 16-13 Braintree District Council (2005). Braintree District Council Local Plan.
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- Ref 16-16 Braintree District Council (2021). Core Strategy.
- Ref 16-17 Chelmsford City Council (2020). Chelmsford Local Plan: Adopted 27 May 2020.
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- Ref 16-23 OJEU (2009) Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations.
- Ref 16-24 Cabinet Office (2017) National Risk Register of Civil Emergencies.
- Ref 16-25 Guidance on Signal Positioning and Visibility (2003) Railway Group Guidance Note.
- Ref 16-26 HMSO (2015) Construction (Design and Management) Regulations 2015.
- Ref 16-27 BRE (2005) Concrete in aggressive ground. BRE Special Digest 1 (SD1:2005). Brussels: BRE.



- Ref 16-28 Department of Energy & Climate Change, (2011); Overarching National Policy Statement for Energy (EN-1).
- Ref 16-29 Department of Energy & Climate Change, (2011); National Policy Statement for Electricity Networks.
- Ref 16-30 HMSO, (2009); The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009.
- Ref 16-31 HMSO, (2003); The Water Act 2003.
- Ref 16-32 HMSO, (1984); The Building Act 1984.
- Ref 16-33 HMSO, (2015); The Building Regulations & c (Amendment) Regulations 2015.
- Ref 16-34 HMSO, (2008); Infrastructure Planning Act 2008.
- Ref 16-35 HMSO, (1995); The Environment Act 1995.
- Ref 16-36 HMSO, (2016); Environmental Permitting (England and Wales) Regulations 2016.
- Ref 16-37 The Hazardous Waste (England and Wales) (Amendment) Regulations 2016.
- Ref 16-38 The Contaminated Land (England) (Amendment) Regulations 2012.
- Ref 16-39 HMSO, (2015); Environmental Damage (Prevention and Remediation) Regulations 2015.
- Ref 16-40 HMSO, (1999); The Anti-Pollution Works Regulations 1999.
- Ref 16-41 Ministry of Housing, Communities and Local Government (MCHLG), (2019); National Planning Policy Framework (NPPF).
- Ref 16-42 Environment Agency, (2009); Updated technical Background to the CLEA model; Science Report: SC050021/SR3 (Contaminated land exposure assessment (CLEA) spreadsheet based tool).
- Ref 16-43 Environment Agency, (2006); Remedial Targets Methodology: Hydrogeological Risk Assessment for Land Contamination Environment Agency.
- Ref 16-44 Environment Agency, (2009); Human Health Toxicological Assessment of Contaminants in Soil, Science Report SC050021/SR2.
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- Ref 16-48 The Chartered Institute of Environmental Health (CIEH) Local Authority Handbooks (various publication dates, 2006 - 2009).
- Ref 16-49 British Standard (BS) 8485:2015; Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
- Ref 16-50 CIRIA, (2007); CIRIA Guidance C665. Assessing risks posed by hazardous ground gases to buildings.
- Ref 16-51 HMSO (1990) Environmental Protection Act 1990.
- Ref 16-52 Infrastructure (EN-5) Her Majesty's Stationery Office (HMSO), (1990); Part IIA of the Environment Protection Act 1990.
- Ref 16-53 HMSO (2016) The Hazardous Waste (England and Wales) (Amendment) Regulations 2016.
- Ref 16-54 HMSO (1989) Control of Pollution (Amendment) Act 1989.

- Ref 16-55 Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and repealing certain Directives (Waste Framework Directive).
- Ref 16-56 Directive 2018/851/EC of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (Waste Framework Directive).
- Ref 16-57 HMSO (2011) The Waste (England and Wales) Regulations 2011. (as amended by The Waste (England and Wales) (Amendment) Regulations 2014).
- Ref 16-58 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe.
- Ref 16-59 MAFF (1988). Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land.
- Ref 16-60 HMSO (1974) Health and Safety at Work Act 1974.
- Ref 16-61 HMSO (1999) The Management of Health and Safety at Work Regulations 1999.
- Ref 16-62 HMSO (1992) The Workplace (Health, Safety and Welfare) Regulations 1992.
- Ref 16-63 HMSO (2015) Construction (Design and Management) Regulations 2015.
- Ref 16-64 IEMA guidance document 'Major Accidents and Disasters in EIA'22
- Ref 16-65 Natural England's Technical Information Note: Agricultural Land Classification: protecting the best and most versatile agricultural land (TIN049) (2009).
- Ref 16-66 Defra Code of Practice for the sustainable use of soils on construction sites (2009)
- Ref 16-67 Waste Carrier: Registration Guidance.
- Ref 16-68 Essex and Southend-on-Sea Waste Local Plan 2017.
- Ref 16-69 Department for Business, Energy and Industrial Strategy (2021); Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref 16-70 Ministry of Housing, Communities and Local Government; Renewable and low carbon energy