
EAST YORKSHIRE SOLAR FARM

**East Yorkshire Solar Farm
EN010143**

Environmental Statement

**Volume 1, Chapter 16: Other Environmental Topics
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16. Other Environmental Topics

16.1 Introduction

- 16.1.1 The purpose of this Environmental Statement (ES) chapter is to present the assessment of environmental topics that do not warrant individual chapters. These topics are not scoped out of the environmental assessment; rather they are included within this single chapter due to the limited nature of the impact associated with the Scheme.
- 16.1.2 This chapter describes and assesses the potential effects of the Scheme on:
- a. Air Quality (section 16.2);
 - b. Glint and Glare (section 16.3);
 - c. Ground Conditions (section 16.4);
 - d. Major Accidents and Disasters (section 16.5);
 - e. Telecommunications, Television Reception and Utilities (section 16.6);
 - f. Materials and Waste (section 16.7); and
 - g. Electric and Electro-magnetic Fields (section 16.8)
- 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 For the topics covered in this chapter, the assessments of potential effects do not strictly follow the approach and methodology outlined in **Chapter 5: Environmental Impact Assessment Methodology** of this ES, where doing so is not necessary to reach a conclusion that there are no likely significant effects. For example, a detailed overview of current baseline conditions is not necessarily required if the effects can clearly be considered negligible, such that a more general overview of baseline conditions is sufficient; and, similarly, it is unnecessary to determine sensitivity of receptors and magnitude of impacts to define significance of effects if there are clearly no likely significant effects. The purpose of this chapter is to provide a high level assessment of other environmental topics where a full chapter adhering to the Chapter 5: EIA methodology is not considered necessary. Within this chapter, the alternative methodology used is clearly outlined for each topic.
- 16.1.5 This chapter is supported by the following Appendices in **ES Volume 2 [EN010143/APP/6.2]**:
- a. **Appendix 16-1: Legislation, Policy and Guidance (Other Environmental Topics)**;
 - b. **Appendix 16-2: Glint and Glare Assessment** (which accompanies section 16.3);
 - c. **Appendix 16-3: Phase 1 Preliminary Risk Assessment Report** (which accompanies section 16.4); and
 - d. **Appendix 16-4: Framework Site Waste Management Plan** (which accompanies section 16.7).

- 16.1.6 This chapter is supported by the following Figures in **ES Volume 3 [EN010143/APP/6.3]**:
- a. **Figure 16-1: Dust Risk Assessment Zones** (which accompanies section 16.2); and
 - b. **Figure 16-2: Authorised and Historic Landfills, Permitted Waste Sites and Waste Site Applications** (which accompanies section 16.4).
- 16.1.7 A glossary and list of abbreviations are defined in **Chapter 0: Table of Contents, Glossary and Abbreviations, ES Volume 1 [EN010131/APP/3.1]**.

Development Parameters Assessed

- 16.1.8 **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]** sets out the development parameters for the Scheme, against which the effects covered in this chapter have been assessed. The assessment has been based on likely worst-case parameters, in accordance with the Rochdale Envelope approach. The actual impacts of the Scheme may therefore be less than anticipated if the Scheme is built to a lesser scale.

16.2 Air Quality

Introduction – Air Quality

- 16.2.1 This section of the ES presents the findings of an assessment of the likely significant effects from Air Quality as a result of the proposed East Yorkshire Solar Farm (hereafter referred to as the Scheme). For a description of the Scheme, refer to **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**.
- 16.2.2 This section identifies and proposes measures to address the potential impacts and likely significant effects of the Scheme on Air Quality, during the construction, operation, and decommissioning phases. It is supported by the following appendices in **ES Volume 2 [EN010143/APP/6.2]**:
- a. **Appendix 16-1: Legislation, Policy and Guidance for Other Environmental Topics.**
- 16.2.3 This section is supported by the following figures in **ES Volume 3 [EN010143/APP/6.3]**:
- a. **Figure 16-1: Dust Risk Assessment Zones.**
- 16.2.4 This section should be read in conjunction with **Chapter 8: Ecology, and Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1]**.

Legislation, Policy and Guidance – Air Quality

- 16.2.5 Legislation, planning policy, and guidance relating to Air Quality and pertinent to the Scheme comprises of the documents listed below. More detailed information can be found in **Appendix 16-1: Legislation, Policy and Guidance for Other Environmental Topics, ES Volume 2 [EN010143/APP/6.2]**.

Legislative Framework – Air Quality

- a. Air Quality Standards Regulations (as amended 2016) (Ref. 16-1);
- b. The Environment Act (1995) (Ref. 16-2);

- c. The Environment Act (2021) (Ref. 16-3); and
- d. The Environmental Targets (Fine Particulate Matter) (England) Regulations (2023) (Ref. 16-4).

National Policy – Air Quality

- a. The UK National Air Quality Strategy (2000) (Ref. 16-5) and Air Quality Strategy 2007 (Ref. 16-6);
- b. Clean Air Strategy (2019) (Ref. 16-7);
- c. National Policy Statement for Energy (EN-1) (2011) (Ref. 16-8); and
- d. Draft National Policy Statement for Energy (Draft EN-1) (2023) (Ref. 16-9); and
- e. National Planning Policy Framework (NPPF) (2023) (Ref. 16-10).

Guidance – Air Quality

- a. Land-Use Planning & Development Control: Planning for Air Quality (EPUK and IAQM), (2017) (Ref. 16-11);
- b. Environmental Improvement Plan (2023) (Ref. 16-12);
- c. Institute of Air Quality Management (IAQM) (2014) Guidance on the assessment of dust from demolition and construction (Ref. 16-13); and
- d. Local Air Quality Management Technical Guidance 2022 (LAQM TG22) (Ref. 16-14).

Consultation – Air Quality

- 16.2.6 A scoping exercise was undertaken in September 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.2.7 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Air Quality.
- 16.2.8 The Scoping Opinion was received on 20 October 2022 (**Appendix 1- 2, ES Volume 2 [EN010143/APP/6.2]**). The feedback received from stakeholders at scoping and Applicant responses in relation to Air Quality are presented in **Appendix 1-3, ES Volume 2 [EN010143/APP/6.2]**. This is also summarised in **Table 16-1**.

Table 16-1. Scoping opinion responses (Air Quality)

Consultee	Summary of comment	How and where addressed	Location of response
Planning Inspectorate	The Scoping Report describes that minimal traffic movements are anticipated during operation; it is anticipated that there will be seven operational arrivals and seven departures daily from light vehicles for maintenance and deliveries. On this basis, the Inspectorate is content to scope this matter out. The ES project description should confirm that there are no emissions from operational plant that require further assessment.	Operational traffic movements are scoped out of the assessment. See also Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1] .	Paragraph 16.2.22 sets out that there are no operational plant emissions.
Planning Inspectorate	The Inspectorate understands from information presented in the Scoping Report that it is proposed to scope out detailed air quality modelling and assessment of effects from construction including dust, and emissions from construction vehicles and plant, on the basis that a qualitative dust assessment and Framework Construction Environmental Management Plan (CEMP) taking account of IAQM guidance are proposed. Subject to the Inspectorate's comments above at ID 3.11.3 to 3.11.4 and confirmation that the proposed construction	A Framework CEMP including air quality management measures in line with Institute of Air Quality Management (IAQM) guidance has been prepared. Heavy Goods Vehicle (HGV) numbers generated by the construction phase are below the IAQM screening criteria where assessment of road traffic impacts on air quality are required, and as such an assessment has been scoped out. Additionally, the majority of tractor-trailer movements generated by the Scheme will not be on the public highway, but will instead be on internal access tracks, as described in Chapter 13: Transport and Access, ES	Framework CEMP [EN/010143/APP/7.7] Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1] Framework Construction Traffic Management Plan (Appendix 13-5, ES Volume 2 [EN010143/APP/6.2] This table. Also paragraph 16.2.40 of this chapter sets out that HGV numbers generated by the construction phase are below the

Consultee	Summary of comment	How and where addressed	Location of response
	<p>vehicle numbers alone or cumulatively with other proposals on relevant links will not exceed the relevant IAQM Environmental Protection UK (EPUK) thresholds, the Inspectorate considers that the need for detailed construction air quality modelling and assessment can be scoped out.</p>	<p>Volume 1 [EN010143/APP/6.1] and the Framework Construction Traffic Management Plan (Appendix 13-5, ES Volume 2 [EN010143/APP/6.2]).</p> <p>None of the developments identified in Appendix 17-1: Cumulative Schemes ES Volume 2 [EN010106/APP/6.2] have undertaken detailed construction air quality modelling. Furthermore, at this time, the timing and routing of construction traffic routing from other developments and how they would interact with that of the Scheme are not known. It is acknowledged that detailed level data on traffic flows/routing and programme for each cumulative scheme would be required for detailed construction air quality modelling to be undertaken. Therefore, as discussed in the Additional Mitigation section below, should an overlap in traffic routing and timing be identified post-consent the Applicant will endeavour to engage with the other schemes on considerate traffic routing. It is noted that all schemes have a shared responsibility to reduce traffic and air quality impacts.</p>	<p>IAQM screening criteria for needing assessment, and as such road traffic impacts have been scoped out of the assessment.</p>
<p>Planning Inspectorate</p>	<p>The ES project description should confirm that there are no emissions from operational plant that require further assessment.</p>	<p>There are no atmospheric emissions from this infrastructure that require further assessment. As discussed in Chapter 2: The Scheme there are no atmospheric emissions from panels and</p>	<p>Paragraph 16.2.22 sets out that there are no operational plant emissions.</p>

Consultee	Summary of comment	How and where addressed	Location of response
		although the greenhouse gas SF ₆ will most likely be used in the switchgear at Field Stations these are 'sealed for life' solutions with no emissions predicted.	See also Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]
Planning Inspectorate	The ES should assess any impacts resulting from the transport of waste generated during construction and decommissioning, which are likely to result in significant effects.	The transport of waste has been included in the total Heavy Goods Vehicle (HGV) trips generated during construction and decommissioning and are therefore assessed within Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1] .	Paragraph 16.2.40 of this chapter sets out that HGV numbers generated by the construction phase are below the IAQM screening criteria for needing assessment, and as such road traffic impacts have been scoped out of the assessment.
Planning Inspectorate	The Scoping Report makes reference to information about existing air quality levels that is available from local authority monitoring programmes, primarily for nitrogen dioxide (NO ₂). It is unclear whether any further monitoring is proposed as part of the ES. Effort should be made to reach agreement with relevant consultation bodies, including the local authorities, as to whether any additional survey or monitoring work is required to inform the baseline, including for other pollutants. The Inspectorate notes that there is potential for air quality impacts on designated nature conservation sites. Baseline information from the Air Pollution Information System	Specific monitoring has not been undertaken and is not proposed as the levels of construction traffic (as presented in Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1]) are below the threshold for triggering a detailed assessment and it is therefore not required.	Not applicable

Consultee	Summary of comment	How and where addressed	Location of response
Planning Inspectorate	<p>(APIS) may also be of relevance to the assessment.</p> <p>The Scoping Report describes that the Proposed Development is surrounded by ecological sites, which may be receptors for air quality impacts. Figure 8.1 shows the location of designated nature conservation sites relative to the scoping area; it includes a number of European, nationally and locally designated sites within a 2km and 10km radius. In addition to these receptors being screened for impacts from construction dust in the ES, the Inspectorate considers that sites that are sensitive to changes in air quality, including nitrogen and acid deposition, should also be considered for impacts arising from construction vehicle movements when details of the construction routes are known. In doing so, reference should be made to relevant guidance, e.g. Institute for Air Quality Management (IAQM) Air Quality Impacts on Designated Sites (2019). Where significant effects are likely to occur, an assessment should be included in the ES.</p>	<p>HGV numbers generated by the construction phase are below the screening criteria for needing assessment, and as such road traffic impacts to European, nationally and locally designated ecological sites have been scoped out of the assessment.</p> <p>An assessment of the impacts of construction dust is included in the Dust Risk Assessment.</p>	<p>Paragraph 16.2.40 sets out that HGV numbers generated by the construction phase are below the IAQM screening criteria for needing assessment, and as such road traffic impacts have been scoped out of the assessment.</p> <p>The Dust Risk Assessment is provided in Table 16-6</p>

Consultee	Summary of comment	How and where addressed	Location of response
Planning Inspectorate	<p>The Scoping Report indicates that the IAQM Guidance on the assessment of dust from demolition and construction (2014) is proposed to be used to inform the study area. The ES should explain how the screening criteria have been applied in the selection of the final study area for dust impacts; it is noted for instance that in addition to the 350m study area from the site boundary a potentially wider study area of up to 500m from the site entrance could be applicable in some circumstances.</p>	<p>This is agreed.</p>	<p>As detailed in paragraph 16.2.26 of this chapter potentially affected air quality sensitive receptors have been identified through a review of Ordnance Survey (OS) mapping and aerial photography</p>
Planning Inspectorate	<p>The ES should include a plan showing the extent of the final study area, including proposed construction routes, the location of receptors (human and ecological) considered in the assessment and the proximity of the study area to the nearest air quality management area (AQMA) in Selby.</p>	<p>This information is set out in Figure 16-1, ES Volume 3 [EN/010143/APP/6.3].</p> <p>Figure 8-1 and Figure 8-2, ES Volume 3 show the location of Statutory and Non-Statutory designated ecological sites in relation to the Order limits.</p>	<p>Figure 16-2, ES Volume 3 [EN/010143/APP/6.3].</p> <p>Figure 8-1 and Figure 8-2, ES Volume 3 EN/010143/APP/6.3].</p>
Planning Inspectorate	<p>The ES should include information about the Air Quality Standards Regulations 2010 and the Air Quality Objectives</p>	<p>Legislation relevant to the Air Quality assessment is listed in in paragraph 16.2.5 of this chapter, with further detail, including the Air Quality Objectives presented in Appendix 16-2, ES Volume 2 [EN/010143/APP/6.2].</p>	<p>Paragraph 16.2.5 of this chapter and Appendix 16-2: Legislation, Policy and Guidance for Other Environmental Topics, ES Volume 2 [EN/010143/APP/6.2].</p>

Consultee	Summary of comment	How and where addressed	Location of response
Natural England	<p>Air quality in the UK has improved over recent decades but air pollution remains a significant issue. For example, approximately 85% of protected nature conservation sites are currently in exceedance of nitrogen levels where harm is expected (critical load) and approximately 87% of sites exceed the level of ammonia where harm is expected for lower plants (critical level of 1µg). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity.</p>	<p>Sensitive Ecosystems have been screened for in the Dust Risk Assessment. The assessment follows IAQM guidance.</p> <p>Impacts from road traffic emissions on sensitive ecosystems has been scoped out of further assessment as HGV numbers generated by the construction phase are below the screening criteria for requiring assessment (see paragraph 16.2.40).</p>	<p>Dust Risk Assessment presented in Table 16-6.</p>
Natural England	<p>The EIA Scoping document states in section 16.2.7 that during the construction and decommissioning phases of the development there may be an increase in traffic associated with the site. However, information on anticipated access routes has not yet been provided,</p>	<p>HGV numbers generated by the construction phase are below the screening criteria for needing assessment, and as such road traffic impacts have been scoped out of the assessment.</p>	<p>Paragraph 16.2.40</p>

Consultee	Summary of comment	How and where addressed	Location of response
	<p>therefore it is unknown whether there will be an increase in traffic within 200m of any European sites. Natural England advises that ammonia sourced from traffic emissions should be included for assessment within the HRA.</p>		
<p>Natural England</p>	<p>If access roads are identified as being within 200m of River Derwent SAC, Natural England also advises that potential air quality impacts on supporting habitats associated with the River Derwent SAC, including riparian habitats, such as wet woodland and fen, should be assessed.</p>	<p>Total HGV numbers generated by the construction phase are below the screening criteria for needing assessment, and as such road traffic impacts have been scoped out of the assessment. Sensitive Ecosystems have been screened for in the Dust Risk Assessment. The assessment follows IAQM guidance.</p>	<p>Paragraph 16.2.40 sets out that HGV numbers generated by the construction phase are below the IAQM screening criteria for needing assessment. The Dust Risk Assessment is presented in Table 16-6.</p>

16.2.9 Further consultation in response to formal pre-application engagement was undertaken through the Preliminary Environmental Information Report (PEI Report), issued in May 2023. Responses to this statutory consultation are presented in the **Consultation Report [EN010143/APP/5.1]. Table 16-2** outlines the statutory consultation responses relating to Air Quality and how these have been addressed through the ES.

16.2.10 Further detail on consultation can also be found in **ES Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1].**

Table 16-2. Statutory consultation responses (Air Quality)

Consultee	Summary of comment	How matter has been addressed	Location of response
North Yorkshire Council	The main Air Quality effects for North Yorkshire Council are likely to be experienced during the construction phase of the grid connection/cable corridor. Overall, the mitigation measures are proportionate and, while there may be some dust effects experienced during the construction phase, the proposed measures are consistent with what we would expect.	The comment is noted. No further response required	N/A
East Riding of Yorkshire Council	The Specialist team has commented on Air Quality. The impact of dust during the three phases of the development are likely to be negligible and not significant. Dust emissions associated with the construction and demolition phases are expected to be mitigated through the CEMP and DEMP.	The comment is noted. No further response required	N/A

Additional Consultation

- 16.2.11 Additional consultation was undertaken with Natural England (through the Discretionary Advice Service, DAS) in relation to the **Habitats Regulations Assessment (HRA) [EN010143/APP/7.12]**. In an email dated 20 October 2023, Natural England confirmed the level of HGV generated by the Scheme is below the level where significant air quality impacts to European designated sites would occur (determined as no Likely Significant Effect (LSE) within the HRA).
- 16.2.12 Natural England also state that the IAQM guidance used within the Dust Risk Assessment (**Table 16-6**) *"determines a zone of influence of 50 m is required for impacts due to dust pollution, and therefore potential for LSE has been determined [within the HRA] for River Derwent Special Area of Conservation (SAC). Natural England advise that the potential impact zone for dust should be 200 m, however based on the location of the work area we agree that it is likely that River Derwent SAC will be the only European designated site with potential for impacts"*. The Dust Risk Assessment presented in this chapter is based upon IAQM guidance and the HRA provides further consideration of dust impacts to the River Derwent SAC.

Assessment Methodology – Air Quality

Assumptions, Limitations and Uncertainties

- 16.2.13 To present a reasonable worst case, the Dust Risk Assessment has made a number of assumptions:
- a. The renovation works at Johnson's Farm (Solar PV Area 1e, **Figure 2-3, ES Volume 3 [EN/010143/APP/6.3]**) to provide office accommodation for the operational solar farm requires some very small scale demolition operations, which fall well below the top end of the "small" magnitude, therefore are still worst case;
 - b. Activity is assumed to be able to take place at any location within the Order limits;
 - c. Although site access points are shown in **Figure 2-3, ES Volume 3 [EN/010143/APP/6.3]** and discussed in the **Transport Assessment, Appendix 13-4, ES Volume 2 [EN/010143/APP/6.2]**, to ensure that good industry practice is captured, site access points have been assumed to be at worst case locations for air quality impacts (located such that there are receptors within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s));
 - d. The construction period has been assessed using the construction programme as set out in **Chapter 2** of this ES (12 months for the Grid Connection Cables and 24 months for the Solar PV Site and Interconnecting Cables) as this provides a worst case assessment - a longer construction period would require fewer daily HGV movements and less activity on site; and
 - e. It has been assumed that decommissioning will have a similar impact as construction as a worst case (anticipated to be of lower impact) and be managed by appropriate on site mitigation measures, such as

those described in the **Framework Decommissioning Environmental Management Plan (DEMP) [EN/010143/APP/7.9]**.

Matters scoped in/scoped out

- 16.2.14 As noted in **Table 16-1**, as minimal traffic movements are anticipated during operation, the impact of operational traffic movements has been scoped out of the assessment in agreement with the Planning Inspectorate.
- 16.2.15 Similarly it was agreed with the Planning Inspectorate that detailed air quality modelling and assessment of effects from construction including dust, and emissions from construction vehicles and plant was not required, on the basis that a qualitative Dust Risk Assessment and CEMP were to be prepared. The qualitative Dust Risk Assessment is presented in **Table 16-6**. A **Framework CEMP [EN/010143/APP/7.7]** is submitted with the DCO Application, with delivery of the detailed CEMP secured through the DCO.
- 16.2.16 At PEI Report stage, it was concluded that the HGV numbers generated by the construction phase would be below the IAQM screening criteria for needing assessment, and as such road traffic impacts were not assessed within the PEI Report. It has been confirmed that the HGV numbers remain below the IAQM screening criteria and construction phase traffic impacts are therefore also not assessed in this ES.

Study Area

- 16.2.17 The Study Area includes features likely to be at risk from possible direct and indirect impacts that might arise from the Scheme, termed the Zone of Influence (Zoi). The potential Zoi for Air Quality includes sensitive receptors within 350 m of the Order limits, as shown on **Figure 2-1, ES Volume 3 [EN/010143/APP/6.3]**, up to 500 m from the site access points, and within 50 m of the roads expected to be affected by the construction phase traffic (following IAQM guidance (Ref. 16-13)). It is noted that a detailed access strategy is presented in the **Transport Assessment, Appendix 13-5, ES Volume 2 [EN/010143/APP/6.2]** and discussed in **Chapter 13: Transport and Access, ES Volume 1 [EN/010143/APP/6.1]**, and site access points are shown in **Figure 2-3 ES Volume 3 [EN/010143/APP/6.3]**. However, to present a worst case for the assessment, worst case access points in terms of potential Air Quality impacts have been considered as discussed in point c of paragraph 16.2.13.
- 16.2.18 The Site is surrounded by numerous ecological sites, which are potential receptors for impacts on air quality. These will be screened for sensitivity to construction dust impacts and nitrogen deposition and included as receptors as appropriate.
- 16.2.19 The assessment relates to dust generation, as well as additional road traffic and plant emissions during the construction and decommissioning phases. The potential for operational impacts is also addressed.
- 16.2.20 The potential impact of the Scheme on local air quality has been determined at the sensitive receptors (human and ecological) identified in the vicinity of the Site.

Methodology

- 16.2.21 There is currently no statutory guidance on the methodology for air quality impact assessments. Several non-statutory bodies have published their

own guidance relating to air quality and development control, such as that jointly issued by Environmental Protection UK and the Institute of Air Quality Management (IAQM) (Ref. 16-11). This assessment has been undertaken based on this guidance.

- 16.2.22 As set out in the Scoping Report (Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]) and as agreed in the Scoping Opinion (Appendix 1-2, ES Volume 2 [EN010143/APP/6.2]), due to the nature of the Scheme, a significant change to traffic flows is not anticipated to occur once the Scheme is operational and there are no emissions from operational plant predicted during operation. A detailed assessment of emissions from the operational phase and the subsequent impact upon local air quality is therefore not required, as agreed with the Planning Inspectorate, and will not be considered further within this assessment.
- 16.2.23 This section therefore details the methods used to assess the potential effects on air quality during the construction and decommissioning phases of the Scheme.
- a. The potential for fugitive emissions of particulate matter from construction and decommissioning phase activities has been qualitatively assessed via a Dust Risk Assessment (see **Table 16-6** and **Figure 16-1 Dust Risk Assessment Zones**). As construction phase road traffic volumes (described in **Chapter 2: The Scheme and Chapter 13: Transport and Access, ES Volume 1 [EN/010143/APP/6.1]** and summarised in paragraph 16.2.40) are not predicted to meet thresholds above which detailed modelling is required, an assessment of impacts due to construction phase traffic has not been undertaken.
- 16.2.24 As set out in **Chapter 2: The Scheme, ES Volume 1 [EN/010143/APP/6.1]** the duration of, and operations required for, decommissioning are similar to those required for construction and consequently the effects of decommissioning are usually similar to, or of a lesser magnitude than, construction effects. Therefore, the assessment of construction phase effects on air quality also represents the likely significant worst case effects which would be experienced at decommissioning (unlike the construction phase there will be no demolition at Johnson's Farm). It should be noted that prior to decommissioning, there will likely be a requirement for a dust risk assessment and dust management plan to be agreed with the planning authority prior to any works taking place.

Impact Assessment Methodology

- 16.2.25 As set out below (paragraph 16.2.30), the Dust Risk Assessment follows IAQM guidance, which does not follow the standard EIA methodology set out in **Chapter 5: EIA Methodology**. Instead, the magnitude of emission is combined with the sensitivity of the area to establish the level of risk that an impact may occur. This risk level is used to apply the appropriate level of mitigation such that there is no significant impact.

Receptor Sensitivity

- 16.2.26 Receptors of interest for the air quality assessment are those which represent locations where people are likely to be present, as the assessment is most concerned with human health. For the purposes of the

Dust Risk Assessment, potentially affected air quality sensitive receptors have been identified through a review of Ordnance Survey (OS) mapping and aerial photography.

- 16.2.27 The IAQM guidance (Ref. 16-13) requires consideration of sensitive ecological receptors within 50 m of the Site or within 50 m from a route used by construction vehicles on the public highway (up to 500 m from the Site access point). Ecological sites with the following designations have been explicitly considered within the Dust Risk Assessment:
- a. Sites of Special Scientific Interest (SSSI);
 - b. Special Protection Areas (SPA);
 - c. Special Areas of Conservation (SAC);
 - d. Ramsar Sites;
 - e. National Nature Reserves (NNR); and
 - f. Local Nature Reserves (LNR).
- 16.2.28 Sites possessing the following designations have also been reviewed; however, explicit consideration as part of the Dust Risk Assessment is not required in accordance with the IAQM guidance (Ref. 16-13):
- a. Ancient Woodland (AW); and
 - b. Local Wildlife Sites (LWS).
- 16.2.29 Ammonia-emitting developments, such as intensive livestock and poultry units, in close proximity to AW sites can cause nutrient deposition leading to a greater abundance of nitrogen tolerant plant species which out-compete and impact on many characteristic ancient woodland plants. There are no AW sites within the Study Area, however it is noted that the River Derwent SAC and SSSI contain wet woodland habitat which is adjacent to an existing access track to be used by the Scheme to access the Grid Connection Corridor and a temporary construction compound (Compound D) from the A63 by Babthorpe (**Figure 2-4, ES Volume 3 [EN/010143/APP/6.3]**). This area is further discussed in **Chapter 8: Ecology, ES Volume 1 [EN/010143/APP/6.1]**. Ammonia can be released in small quantities from engine exhausts; however, because of the low volume of construction traffic, vehicles movements associated with the Scheme will not result in significant emissions of ammonia. Therefore, this impact has been scoped out of this assessment as significant effects are not anticipated.

Significance Criteria

- 16.2.30 When assessing the significance of dust impacts during the construction phase, IAQM recommends that significance is only assigned to an effect after considering the construction activity with mitigation (Ref. 16-13).
- 16.2.31 Appropriate mitigation measures commensurate with the level of risk identified in the Dust Risk Assessment will be defined in and implemented through the detailed CEMP, secured through the Requirements of the DCO. A **Framework CEMP [EN/010143/APP/7.7]** on which the detailed CEMP will be based is submitted with the DCO Application and appropriate mitigation measures are also described in **Table 16-4**. Implementation of these measures will prevent significant effects on receptors, thereby

resulting in a residual effect that can be considered 'not significant'. Where this is not practicable, it is important to consider the specific characteristics of the Site and the surrounding area to determine whether construction phase dust impacts are likely to be significant in the context of the Scheme (Ref. 16-13).

Methodology for Assessment of Fugitive Emissions of Particulate Matter during Construction and Decommissioning Phases

- 16.2.32 A qualitative risk-based assessment has been undertaken to assess the significance of any effects on sensitive receptors associated with the construction phase. The overall risk is a worst case and considered to be appropriate for the decommissioning phase as well, however this would be reassessed at the time as part of the Decommissioning Environmental Management Plan. It is noted however that there would be no demolition works as part of the decommissioning. The assessment is based on IAQM guidance (Ref. 16-13) and considers potential sources of emissions from four main activity groupings:
- a. Demolition;
 - b. Earthworks;
 - c. Construction; and
 - d. Track-out.
- 16.2.33 The emphasis within the IAQM guidance (Ref. 16-13) is on clarifying the risk of dust impacts from the Scheme, which will allow mitigation measures commensurate with that risk to be identified.
- 16.2.34 For each activity group, the following steps are applied with respect to identifying the potential effects, before coming to an overall conclusion about the significance of the effects predicted:
- a. Identify the nature, duration and the location of activities being undertaken;
 - b. Establish the risk of significant effects occurring as a result of these activities;
 - c. Review the proposed or embedded mitigation against good site practice;
 - d. Identify additional mitigation measures, if necessary, to reduce the risk of a significant adverse effect occurring at receptors; and
 - e. Summarise the overall effect of the works with respect to fugitive emissions of particulate matter and report the significance of the effects.
- 16.2.35 The findings of the Dust Risk Assessment are presented within **Table 16-6**. Construction of the Scheme will take place sequentially (as described in **Chapter 2: The Scheme**, ES Volume 1 [EN/010143/APP/6.1]). As such, potential fugitive emissions may be lower than expected compared to the size of the Order limits (when considering the Site in reference to the IAQM Guidance (Ref. 16-13), as construction will not be occurring across the entire Site at one time.

- 16.2.36 Based on design information and the agreed design for the ES assessment (**Figure 2-3, ES Volume 3 [EN/010143/APP/6.3]**), the following sources of emissions have been scoped out of the air quality assessment presented in this ES, as described below

Emissions from Non-Road Mobile Machinery (NRMM)

- 16.2.37 Construction Non-Road Mobile Machinery (NRMM) includes construction machinery such as excavators, loaders, and bulldozers. Emissions from construction NRMM will have the potential to increase pollutants such as nitrogen dioxide (NO₂) and inhalable particles, with diameters of 10 micrometers (µm) or less. (PM₁₀) concentrations locally when in use during construction. However, IAQM guidance (Ref. 16-13) states that “Experience of assessing the exhaust emissions from on-site plant (NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed.”
- 16.2.38 Emissions from NRMM will be temporary and localised and will be controlled through good-practice mitigation measures (such as the embedded mitigation measures set out in Table 16-4). Additionally, exhaust emission from NRMM are controlled through European Directives. For that reason, construction phase NRMM emissions associated with the Scheme should not be significant and, therefore, are not considered any further in this assessment.

Construction Phase Road Traffic Emissions

- 16.2.39 The construction phase of the Scheme is likely to lead to a small increase in the number of vehicles on the local highway network for the duration of the construction works (refer **Chapter 2: The Scheme** and **Chapter 13: Transport and Access, ES Volume 1 [EN/010143/APP/6.1]**). IAQM guidance (Ref. 16-11) sets out criteria to establish the need for an air quality assessment for the construction phase of a development as being a change of HDV (Heavy Duty Vehicles) flows of more than 100 Average Daily Traffic (AADT) outside an Air Quality Management Area (AQMA). In the case of the Scheme, HDV are equivalent to HGV (Heavy Goods Vehicles, as referred to in **Chapter 13: Transport and Access**), as construction vehicles will not include large buses and coaches.
- 16.2.40 During the peak construction period for the Scheme there would be up to 25 HGV deliveries (50 movements) (including waste removal) per day. This includes HGVs associated with the construction of the Solar PV Site, Interconnecting Cables, Grid Connection Cables and the Site Accesses. As described in **Chapter 2: The Scheme** and **Chapter 13 Transport and Access, ES Volume 1 [EN/010143/APP/6.1]** and the **Transport Assessment, Appendix 13-4, ES Volume 2 [EN/010143/APP/6.2]** to reduce the movement of trucks/lorries (HGV) on the public highway, deliveries would arrive at compound locations (shown in **Figure 2-4, ES Volume 3 [EN/010143/APP/6.3]** and in the **Transport Assessment**); materials would then be transferred to tractor/trailers for onward transport. The tractor/trailers are akin to the agricultural vehicles which currently use the road network in the vicinity of the Scheme. A large proportion of the tractor/trailer movements would be internal to the Site

Additionally, to present a worst case, it has been assumed that each HGV delivery would require two tractor/trailers for onward transport of goods, resulting in up to 50 tractor/trailers per day. However, some HGVs (such as those involved in waste movements) would not generate the need for tractor/trailer. An absolute maximum of tractor/trailer movements is therefore 100 per day, however as not all deliveries will require transfer, and the majority of trips will be internal to the site, a realistic worst case of 50 tractor/trailer movements per day has been assumed. The tractor/trailers are considered to be HGV; therefore, in total as a worst case, there would be 100 HGVs per day in the peak construction period. These HGV movements are below the criteria (for HDV) set out in the paragraph above. As the criteria is not reached detailed dispersion modelling exercise is therefore not proposed to be undertaken.

Baseline Conditions - Air Quality

16.2.41 This section describes the baseline environmental Study Area with specific reference to Air Quality.

Data Sources

16.2.42 In preparation of this chapter, the following sources of published information have been used to establish the baseline conditions:

- a. East Riding of Yorkshire (2022). Air Quality Annual Status Report (Ref. 16-16);
- b. Selby District Council (2022). Air Quality Annual Status Report (ASR) (Ref. 16-17);
- c. East Riding of Yorkshire Council (2023). Public Air Quality Portal (Ref. 16-18); and
- d. Defra (2020) 2018 Reference Year Background Maps (Ref. 16-19).

Existing Baseline

16.2.43 This section describes the baseline environmental characteristics for the Scheme and surrounding areas as relevant to Air Quality.

16.2.44 East Riding of Yorkshire Council undertake routine ongoing monitoring of ambient air quality as part of their Local Air Quality Management responsibilities under Part IV of the Environment Act (1995) (as amended by the Environment Act 2021) and subsequent Regulations (Ref. 16-40). In 2022, East Riding of Yorkshire Council undertook passive monitoring of nitrogen dioxide (NO₂) via a network of 92 diffusion tubes located along principal traffic routes across the county in order to quantify kerbside NO₂ concentrations in the vicinity of relevant receptors (14 were new locations for 2022). In addition, the Council have seven automatic monitoring units. (Ref. 16-16). The neighbouring authority Selby District Council¹ also undertake air quality monitoring of NO₂ using passive diffusion tubes, however these are all located in and around Selby town (Ref. 16-17) and

¹ On 1 April 2023 North Yorkshire County Council and its six constituent District Councils (including Selby District Council) were merged to form the Unitary Authority of North Yorkshire Council. Consequently, the monitoring undertaken up to end of March 2023 was by Selby District Council, with subsequent monitoring by North Yorkshire Council.

are consequently not relevant to the baseline for the Scheme due to their distance from the Site and different environs.

- 16.2.45 There are no Air Quality Management Areas (AQMAs) within the administrative area of East Riding of Yorkshire Council and air quality is considered by the Council to be good (Ref. 16-16). The most recent available monitoring results for 2022 does not give any cause for concern with regard to the air quality objectives.
- 16.2.46 One AQMA is located in the administrative area of the former Selby District Council, in Selby town centre (shown in **Figure 16-1, ES Volume 3 [EN/010143/APP/6.3]**), however due to the distance of the AQMA from the Site, it is not considered likely to be affected by the Scheme, particularly as construction vehicles would not be routed through the town centre. For completeness, monitoring is all below the air quality objective for NO₂ (40 micrograms per cubic metre of air (µg/m³)). Monitoring results for 2020 and 2021 generally indicate a reduction in levels of NO₂ compared with 2019 data; as noted in paragraph 16.2.45, these data will have been influenced by the Covid-19 pandemic and should therefore be interpreted with caution. 2023 monitoring data has not been published.
- 16.2.47 East Riding of Yorkshire Council provide an online map showing the location and results of current continuous monitoring locations (Ref. 16-18). The closest diffusion tubes to the Site are in the centre of Howden (approximately 1.8 km south-east of the Solar PV Site) and Bubwith (approximately 1.5 km north-west of the Solar PV Site). Concentrations are well below the air quality objective of 40 µg/m³ for NO₂. As noted in paragraph 16.2.44, Selby District Council only monitor for NO₂ in and around Selby town, and as such do not have any monitoring equipment in the vicinity of the Site.

Background Pollutant Concentrations

- 16.2.48 The total concentration of a pollutant comprises those contributions from explicit local emission sources such as roads, chimney-stacks, etc, and those that are transported into an area from indeterminate sources by wind from further away. If all the explicit local sources were removed, all that would remain is that which comes from indeterminate sources; it is this component that is called 'background'. A good understanding of background concentrations is important when completing air quality assessments as it allows for a better understanding of local pollutant sources.
- 16.2.49 Background data for the relevant 1 km x 1 km grid squares (related to the Study Area) was sourced from Defra's 2018-based Background Maps (Ref. 16-19) for the assessment year of 2023; these data are presented in **Table 16-3**. These data represent the most current and up to date data source.

Table 16-3. Background Pollutant Concentrations 2023, µg/m³

X coordinate	Y coordinate	NO ₂	PM ₁₀	PM _{2.5}
467500	423500	6.9	14.3	7.8
468500	428500	6.6	13.7	7.6
472500	432500	6.2	13.8	7.5
473500	424500	10.8	14.6	8.6

X coordinate	Y coordinate	NO₂	PM₁₀	PM_{2.5}
475500	433500	6.1	14.0	7.6
475500	431500	6.4	12.7	7.3
475500	437500	6.3	13.6	7.6
477500	436500	5.8	14.0	7.5
478500	439500	5.6	13.0	7.2
479500	432500	6.2	13.5	7.4
479500	433500	6.2	14.2	7.6
	MAX	10.8	14.6	8.6
	MIN	5.6	12.7	7.2
	MEAN	6.6	13.8	7.6

Baseline Dust Climate

- 16.2.50 A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. Dust levels can be affected by long range transport of dust from distant sources into the local vicinity.
- 16.2.51 This baseline rate of soiling is considered normal and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.
- 16.2.52 Existing local sources of particulate matter include wind-blown dust from agricultural operations, exhaust emissions from energy plant and road vehicles, brake and tyre wear from road vehicles, and the long-range transport of material from outside the Study Area.

Future Baseline

- 16.2.53 Background concentrations are predicted to improve in future years due to improvements in fleet emissions over time, for example sale of new petrol and diesel cars, vans and other commercial vehicles and sale of new diesel HGV will be phased out over time in line with government policy. As a worst-case assessment, current background concentrations have been used in the assessment.

Embedded Mitigation – Air Quality

- 16.2.54 Where practicable, mitigation measures have been incorporated into the Scheme design and/or how it shall be constructed. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as far as is practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation/mitigation by design approach has been taken into account when evaluating the significance of the potential impacts.

Construction and Decommissioning

- 16.2.55 The adoption of good site practice will be implemented through measures to control dust as outlined within the IAQM guidance, which are commensurate with the level of risk identified in the assessment and the construction phase activities for the Scheme (Ref. 16-13). As decommissioning operations are predicted to be similar to construction, the same good practice measures are predicted to apply.
- 16.2.56 These embedded good or standard practice mitigation measures are summarised in Table 16-4 and Table 16-5 based on any mitigation that is ‘highly recommended’ in the IAQM dust guidance. The list is not exhaustive, and more detail is provided in the **Framework CEMP [EN/010143/APP/7.7]** submitted with the DCO Application. Implementation of these measures will be secured through the provision of a detailed CEMP as a DCO Requirement. A **Framework DEMP [EN/010143/APP/7.9]** is also submitted with the DCO Application with the detailed DEMP to be prepared prior to the start of decommissioning, again secured via a DCO Requirement.

Table 16-4. Embedded Mitigation Measures

Activity	Mitigation Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the Site. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Prior to construction develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the ‘highly recommended’ measures within the IAQM guidance (Ref. 16-13). The desirable measures should be included as appropriate for the Site. The DMP may include, as appropriate/necessary, monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on-site or offsite, and the action taken to resolve the situation in the logbook.

Activity	Mitigation Measure
	<p>Hold regular liaison meetings with other high-risk construction sites within 500 m of the Site (if applicable), to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.</p> <p>Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.</p> <p>Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.</p> <p>Agree, where necessary/appropriate, dust deposition, dust flux, and/or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where practicable, commence baseline monitoring at least three months before work commences in different parts of the Site. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.</p>
Preparing and Maintaining the Site	<p>Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.</p> <p>Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on-site where stockpiles (if required) are within 100 m of receptors.</p> <p>Fully enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period where operations are within 100 m of receptors.</p> <p>Avoid site runoff of water or mud.</p> <p>Keep site fencing, barriers and scaffolding clean using wet methods.</p> <p>Remove materials that have a potential to produce dust from the Site as soon as practicable, unless being re-used on-site. If they are being re-used on-site, cover as described below.</p> <p>Cover, seed or fence stockpiles to prevent wind whipping.</p> <p>Ensure all vehicles switch off engines when stationary – no idling vehicles.</p>

Activity	Mitigation Measure
Operating Vehicles / Machinery and Sustainable Travel*	Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced internal traffic routes/ tracks and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Produce a Delivery Management System (may also be referred to as a Construction Logistics Plan) to manage the sustainable delivery of goods and materials
	Implement a Travel Plan (as part of the CTMP (Appendix 13-5, ES Volume 2 [EN010143/APP/6.2])) that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)
Operations	Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g.: suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable and appropriate.
	Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	Avoid bonfires and burning of waste materials.

Table 16-5. Activity Specific Mitigation Measures

Activity	Mitigation Measure
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
	Only remove the cover in small areas during work and not all at once.
Construction	Avoid scabbling (roughening of concrete surfaces) if practicable.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a

Activity	Mitigation Measure
	particular process, in which case ensure that appropriate additional control measures are in place.
	For any supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving the Site are covered to prevent escape of materials during transport.
	Inspect internal tracks for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site logbook.
	When required, dampen down with water access tracks and haul routes with fixed or mobile sprinkler systems, or mobile water bowsers and implement regular cleaning.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable).
	Locate access gates at least 10 m from receptors where practicable.

Operation

- 16.2.57 There are no anticipated impacts on air quality as a result of the operation of the Scheme. Therefore, no mitigation is required at this stage.

Assessment of Likely Impacts and Effects – Air Quality

Construction Effects

- 16.2.58 The Dust Risk Assessment considers the potential magnitude of dust emissions at each stage of the Scheme in conjunction with the sensitivity of the surrounding area, following IAQM guidance. Based on these parameters, the Site will be classified as low, medium or high risk, and mitigation measures corresponding to the perceived level of risk proposed. The Dust Risk Assessment is not an impact assessment, but an assessment of the risk of nuisance being caused by the operation. The resulting risk level is used to determine the mitigation measures required to be implemented to ensure that there is no significant impact from the construction phase activities.

- 16.2.59 The assessment considers the potential dust risk across a set of predefined zones, up to 350 m from the Order limits. These zones are presented in **Figure 16-1, ES Volume 3 [EN/010143/APP/6.3]**.
- 16.2.60 The Dust Risk Assessment is provided in **Table 16-6**.

Table 16-6. Dust Risk Assessment

STEP 1 – SCREENING

1a.	Is a human receptor site within:	
	50 m of site boundary	Y
	50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)	Y
1b.	Is an ecological receptor site within:	
	50 m of the site boundary	Y
	50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)	Y

IF ANSWERS TO 1A OR 1B ARE ‘YES’ COMPLETE 1C AND COMPLETE THE ASSESSMENT

1c.	<p>Provide a description of the proposed demolition and construction activities, their location and duration and any phasing of the development, including:</p> <ul style="list-style-type: none"> The proximity and number of receptors; The specific sensitivity of the receptor(s), e.g. a primary school or hospital; The duration for which the sources of dust emissions may be close to the sensitive receptors; and In the case of PM₁₀ the local background concentration. <p><i>Subject to being granted consent and following a final investment decision, the earliest construction could start is in 2025. Construction of the Grid Connection Cables is anticipated to require 12 months, whereas construction of the solar farm will require an estimated 24 months, with operation therefore anticipated to commence in 2027. Sources of dust emissions are likely to occur during this period. The greatest potential for dust effects is likely to occur during the excavation and earthworks phases, in addition to the substructure construction period.</i></p> <p><i>The Site is located in a rural area but close to a number of villages, and consequently there are a large number of receptors in proximity to the Site that may be affected by the works. This includes high sensitivity receptors such as residential properties, as well as medium sensitivity receptors such as commercial, office and warehouse units.</i></p> <p><i>Defra background maps indicate an average background PM₁₀ concentration of 13.8 µg/m³ across the Study Area in 2023. This is well below the annual average objective value of 40 µg/m³.</i></p>
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STEP 2 – ASSESS THE RISK OF DUST IMPACTS

STEP 2A – Define the Potential Dust Emission Magnitude

DEMOLITION PHASE

2a(i)	Is the volume of demolition:	
	Large Total volume of building to be demolished (>50,000 m ²); or Potential dusty construction material (e.g. concrete); or On-site crushing and screening; or Demolition activities >20 m above ground level.	N/A
	Medium Total volume of building to be demolished 20,000 m ³ – 50,000 m ³ ; or Potential dusty construction material; or Demolition activities 10-20 m above ground level.	N/A
	Small Total volume of building to be demolished <20,000 m ³ ; or Construction material with low potential for dust release (e.g. metal cladding or timber); or Demolition activities <10 m above ground level and demolition during wetter months.	Y

EARTHWORKS PHASE

2a(ii)	Is the scale of the earthworks:	
	Large Total site area >10,000 m² ; or Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); or >10 heavy earth moving vehicles active at any one time on-site; or Formation of stockpile enclosures >8 m in height; or Total material moved >100,000 tonnes (where known).	Y

	<p>Medium Total site area 2,500 m²-10,000 m²; or Moderately dusty soil type (e.g. silt); or 5-10 heavy earth moving vehicles active at any one time on-site; or Formation of stockpile enclosures 4-8 m in height; or Total material moved 20,000-100,000 tonnes (where known).</p>	
	<p>Small Total site area <2,500 m²; or Soil type with large grain size (e.g. sand); or <5 heavy earth moving vehicles active at any one time onsite; Formation of stockpile enclosures <4 m in height; or Total material moved <10,000 tonnes (where known), or earthworks during wetter months.</p>	
CONSTRUCTION PHASE		
2a(iii)	Is the scale of the works:	
	<p>Large Total construction volume >100,000 m³; or Piling; or On-site concrete batching; or Sandblasting.</p>	Y
	<p>Medium Total building volume 25,000 m³-100,000 m³; or Potentially dusty construction material (e.g. concrete); or On-site concrete batching.</p>	
	<p>Small Total building volume <25,000 m³; or Construction material with low potential for dust release (e.g. metal cladding or timber).</p>	

TRACKOUT

2a(iii)	Only receptors within 50 m of the route(s) used by vehicles on the public highway and up to 500 m from the site entrance(s) are considered to be at risk from the effects of dust. Will the trackout be:	
	Large >50 Heavy Duty Vehicle (HDV; >3,5t) outward movements in one day; Potentially dusty surface material (e.g. high clay/silt content); or Unpaved road length >100 m.	Y
	Medium 10-50 HDV (>3,5t) outward movements in any one day; Moderately dusty surface material (e.g. high clay content); or Unpaved road length 50-100 m (high clay content)	
	Small <10 HDV (>3.5t) trips in any one day; Surface material with low potential for dust release; or Unpaved road length <50 m.	

STEP 2B – Define the Sensitivity of the Area

Define the Receptor Sensitivity

2b(i)	Sensitivity of People to Dust Soiling Effects	
	Is the location a:	
	High sensitivity receptor	Y
	Medium sensitivity receptor	
	Low sensitivity receptor	
2b(ii)	Sensitivity of People to Health Effects of PM ₁₀	
	Is the location a:	
	High sensitivity receptor	Y
	Medium sensitivity receptor	

	Low sensitivity receptor
2b(iii)	<p>Sensitivity of Receptors to Ecological Effects – <i>The following designated ecological sites have been identified within 1 km of the Order limits:</i></p> <p><i>River Derwent SSSI & SAC*; and Barn Hill Meadows SSSI.</i></p> <p><i>Due to their presence within 1 km of the Order limits, the risk of dust effects at Nationally or European designated ecological sites will be considered further in this assessment.</i></p> <p><i>The following non-designated sites are within 1 km of the Order limits:</i></p> <p>Tottering Lane, Gribthorpe Local Wildlife Site (LWS)*; Wessel Verge LWS*; Bubwith – Holme-on-Spalding-Moor Disused Railway Line LWS; North Howden Fish Ponds LWS; Barnhill Candidate LWS; Yarmshaw Plantation LWS; Old Clay Pits, Highfield – Historic LWS; Brockholes SINC.</p> <p><i>* These sites are at some points within the Order limits. The qualifying habitats of the River Derwent SSSI and SAC, are not within the Order limits along the access to Compound D from the A63 (as described in paragraph 16.2.29) and at the crossing of the River Derwent the qualifying habitats are avoided through the use of Horizontal Directional Drilling (HDD). Therefore the assessment is valid. For the LWSs, it is acknowledged that works will directly impact some areas of these sites during the creation of site accesses and installation of cables, however during these works the habitats will be removed either permanently or temporarily. The proposed mitigation measures will be effective in the protection of the habitats adjacent to the works areas and within the works areas; and therefore the assessment remains valid.</i></p>

Estimate the number of receptors and the distance from the Site boundary:

There are between 15-20 residential dwellings within 20 m of the Order limits (Site Boundary).

Following the sensitivity tables in the IAQM guidance:

Combined Sensitivity of the area for Dust Soiling Effects = HIGH. The presence of >10 high sensitivity receptors (i.e. residential dwellings) within 20 m of the Site boundary results in a combined HIGH sensitivity for Dust Soiling Effects.

Combined Sensitivity of the area to Human Health Impacts = LOW. Annual mean PM₁₀ concentrations of <24 across the study area in conjunction with the presence of <100 sensitive receptors within 20 m of the Site boundary result in a combined LOW sensitivity for Human Health Impacts.

Combined Sensitivity of the area to Ecological Impacts = HIGH. Nationally designated, potentially sensitive ecosystems are situated within 20 m (and within*) of the Order Limits, thus a combined HIGH sensitivity of the Study Area to Ecological Impacts has been determined.

**The assessment methodology does not consider locations within the boundary, however the highest level of mitigation is recommended for the protection of ecological sites. It is recommended additional attention be paid to sites that lie within the Order limits and further measures should be taken if any dust is observed.*

Magnitude of Dust Emissions and Sensitivity of the Area

Demolition

16.2.61 The development of the Scheme will require a small amount of demolition associated with the redevelopment of the derelict building at Johnson's Farm into office accommodation, amounting to less than the 20,000 m³ criterion. The potential dust emissions magnitude associated with demolition is therefore considered to be small. The sensitivity of the area to dust soiling during demolition is high due to the proximity of sensitive receptors, however it is low for human health impacts due to low background particulate matter concentrations.

Earthworks

16.2.62 The Site is greater than the 10,000 m² criterion, and it is anticipated that there will be more than 10 heavy earth moving vehicles active on Site at any one time. The potential dust emissions magnitude associated with earthworks activities is therefore considered to be large. The sensitivity of the area to dust soiling during the earthworks phase is high due to the proximity of sensitive receptors, however it is low for human health impacts due to low background particulate matter concentrations.

Construction

16.2.63 The Site has an area exceeding the 100,000 m² criterion and therefore the potential dust emissions for construction activities is considered to be large. The sensitivity of the area to dust soiling is high, whereas in relation to human health the area sensitivity is considered to be low due to the background particulate matter concentrations being well below the objective value with negligible risk of exceedance.

Trackout

16.2.64 Considering the size of the Site, it is likely that there will be an unpaved road exceeding 100 m in length. Therefore, the potential dust emissions for trackout is assumed to be large. The sensitivity of the area to dust soiling is high, however the area sensitivity to human health impacts is considered to be low due to the background particulate matter concentrations being well below the objective value with negligible risk of exceedance.

16.2.65 The River Derwent SSSI & SAC lie within the Order limits on the Grid Connection Corridor. These internationally and nationally designated sites are crossed by the Grid Connection Corridor south of Wressle (where they are crossed by Horizontal Directional Drill (HDD) resulting in working area being outside of the designated sites), and again north of the A63 by Babthorpe (as described in 16.2.29). The Grid Connection Corridor runs adjacent to the River Derwent and these sites until the crossing point of the River Ouse (see **Chapter 2: The Scheme, ES Volume 1 [EN/010143/APP/6.1]** and **Figure 8-1, ES Volume 3 [EN/010143/APP/6.3]**). Barn Hill Meadows SSSI is additionally located within 1 km of the Order Limits to the east of Howden. The sensitivity of the area to ecological impacts is therefore considered to be high.

16.2.66 A summary of the magnitude of emissions and area sensitivity is provided in **Table 16-7** and **Table 16-8**.

Table 16-7. Summary of potential dust emission magnitudes for construction phase activities

Activity	Potential Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Large
Trackout	Large

Table 16-8. Summary of area sensitivity to construction phase activities

Potential Effect Type	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecology	High	High	High	High

16.2.67 The magnitude of emissions (**Table 16-8**) and area sensitivity (**Table 16-7**) are combined to determine the risk of effects (prior to accounting for the embedded mitigation) as shown in **Table 16-9**. The risk level is used to determine the level of mitigation required, which is reflected in the measures set out in **Table 16-4** and **Table 16-5**. IAQM recommends that *significance* is only assigned to the effect after considering the construction activity with mitigation.

Table 16-9. Summary of risk of dust effects for demolition and construction phase activities (before mitigation applied)

Summary of Dust Risk

Potential Effect Type	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	High Risk	High Risk	High Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk
Ecology	Medium Risk	High Risk	High Risk	High Risk

16.2.68 The IAQM guidance recommends that mitigation measures be commensurate to the highest risk category identified during the Dust Risk Assessment. The Site is therefore categorised as High Risk and mitigation measures for a high risk site will be implemented as set out in **Table 16-4** and **Table 16-5**.

16.2.69 The implementation of the mitigation measures is expected to prevent the occurrence of significant impacts arising from dust generation during the construction phase. Minimising emissions of dust and/or suppressing dust at the source will reduce the potential for transport of dust off-site, therefore reducing the potential exposure of sensitive receptors to dust related impacts. Residual effects are therefore assessed as being **not significant**, as summarised in **Table 16-10**.

Table 16-10. Summary of magnitude of impact and significance of effect (Air Quality)

Receptor	Sensitivity (Value)	Description of Impact	Magnitude	Effect Category	Significant effect (Yes / No)
Human Health	High	Emissions from construction and decommissioning activities affecting human health	N/A (see 16.2.25)	High Risk (see 16.2.25)	No
Sensitive Ecosystems	High	Emissions from construction and decommissioning activities affecting sensitive ecosystems	N/A (see 16.2.25)	High Risk (see 16.2.25)	No

Additional Mitigation, Enhancement, and Monitoring – Air Quality

16.2.70 No additional mitigation or enhancement measures beyond the embedded mitigation measures described in (**Table 16-4** and **Table 16-5**) are required with respect to Air Quality effects arising from the Scheme, due to no significant adverse effects being identified.

Monitoring

16.2.71 No monitoring is required for air quality.

Residual Effects – Air Quality

16.2.72 As no significant adverse effects were identified (as presented in **Table 16-11**), there will be no residual effects on air quality associated with the Scheme.

Table 16-11. Residual effects – Air Quality (construction / decommissioning)

Receptor	Description of impacts including duration	Embedded mitigation	Significance of effect with embedded mitigation	Additional mitigation/enhancement measures	Residual effect
Human Health	Emissions from construction and decommissioning activities affecting human health. Short-term Temporary (During the construction or decommissioning phase only)	Good practice site mitigation in line with High Risk sites.	Not significant	Not required	Not significant
Sensitive Ecosystems	Emissions from construction and decommissioning activities affecting sensitive ecosystems. Short-term Temporary (During the construction or decommissioning phase only)	Good practice site mitigation in line with High Risk sites.	Not significant	Not required	Not significant

Cumulative Effects – Air Quality

- 16.2.73 This section assesses the potential effects of the Scheme in combination with the potential effects of other proposed and committed plans and projects including other developments (referred to as ‘cumulative schemes’) within the surrounding area.
- 16.2.74 The cumulative schemes to be considered in combination with the Scheme have been agreed in consultation with relevant Local Planning Authorities and are listed in **Appendix 17-1, ES Volume 2 [EN010106/APP/6.2]**. The cumulative assessment methodology is presented within **Chapter 5: EIA Methodology, ES Volume 1 [EN010106/APP/6.1]**.
- 16.2.75 This cumulative effect assessment identified for each receptor those areas where the predicted effects of the Scheme could interact with effects arising from other plans and, or projects on the same receptor based on a spatial and, or temporal basis.
- 16.2.76 There are potential cumulative effects where any scheme will be in the construction phase at the same time as East Yorkshire Solar Farm. Dust nuisance from on-site operations should not be significant, as impacts will be negligible with the adoption of the recommended mitigation measures.
- 16.2.77 However, there is a potential for cumulative schemes to coincide with the Scheme construction phase and lead to cumulative impacts. The cumulative schemes that could potentially result in a cumulative impact of construction traffic impacts are set out in **Table 16-12**. The schemes have been selected based on the potential for construction phase overlap, and potential for haul-routes to be co-located (routes of HGV traffic to use the same roads). It should be noted that not all the developments may come forward. None of the developments identified in **Appendix 17-1, ES Volume 2 [EN010106/APP/6.2]** have undertaken detailed construction air quality modelling. Furthermore, at this time, the timing and routing of construction traffic routing from other developments and how they would interact with that of the Scheme are not known. As such a meaningful assessment of the cumulative construction scenario air quality impacts cannot be undertaken at this time.
- 16.2.78 Should an overlap in traffic routing and timing be identified post-consent the Applicant will endeavour to engage with the other schemes on considerate traffic routing. It is noted that all schemes have a shared responsibility to reduce traffic and air quality impacts. It is noted that Chapter 13: Transport and Access., ES Volume 1 [EN010143/APP/6.1] assessed that impact of cumulative developments is minimal on the 24-hour traffic flows.

Table 16-12. Significant cumulative effects (air quality) – construction phase

Scheme ID	Scheme name	LPA	Distance from the Order limits
1	Helios Renewable Energy Project	Planning Inspectorate	Overlap with the Order limits.
2	Scotland to England Green Link (SEGL2)	East Riding of Yorkshire	Overlap with the Order limits.
3	Scotland to England Green Link (SEGL2)	North Yorkshire Council	Overlap with the Order limits.

Scheme ID	Scheme name	LPA	Distance from the Order limits
4	Drax Carbon Capture	Planning Inspectorate	Overlap with the Order limits.
5	Humber Low Carbon Pipelines	Planning Inspectorate	Overlap with the Order limits.
6	Drax Re-power.	Planning Inspectorate	Overlap with the Order limits.
7	Relief Road and Residential development at Land South Of Thorpe Hall Thorpe Road Howden	East Riding of Yorkshire	0.16 km
15	Poultry buildings at Old Rush Farm Spaldington Road	East Riding of Yorkshire	0.01 km
22	Solar Farm at and Land Off Camela Lane	North Yorkshire Council	0.76 km
25	Lakeside Energy Storage	North Yorkshire Council	Overlap with the Order limits.
26	Lakeside Energy Storage	North Yorkshire Council	Overlap with the Order limits.
28	Erection of units at Land East Of The Knoll Booth Ferry Road	East Riding of Yorkshire	2.7 km
29	Industrial units at Land East Of The Knoll Booth Ferry Road	East Riding of Yorkshire	0.5 km
50	MJP45 Minerals Allocation	North Yorkshire Council	2 km
51	HOW-G Mixed Use Allocation	East Riding of Yorkshire	0.17 km
52	HOW-A Residential Allocation	East Riding of Yorkshire	1.6 km
53	HOW-H Employment allocation	East Riding of Yorkshire	2.9 km
65	Solar Farm at Land North And South Of Camela Lane	North Yorkshire Council	0.65 km
66	Horticultural Facility at Brigg Lane	North Yorkshire Council	0.83 km
67	Residential development at Morello Garth Park Lane	North Yorkshire Council	2.3 km
74	Solar Farm at Land South Of A645	North Yorkshire Council	0.56 km

Scheme ID	Scheme name	LPA	Distance from the Order limits
75	Battery Storage Facility at Land Off Hales Lane	North Yorkshire Council	0.05 km
87	Residential Development at Land East Of Broadacres	North Yorkshire Council	2.6 km

16.2.79 There are no anticipated cumulative operational impacts as impacts from the scheme are negligible.

16.2.80 It is not possible to identify cumulative decommissioning impacts at this stage as it is unknown what other schemes could be operating at the same time. However, based on current information, it is not expected that there would be potential for likely significant effects on any receptors.

16.3 Glint and Glare

Introduction – Glint and Glare

- 16.3.1 This section summarises the potential effects of glint and glare associated with the Scheme on surrounding receptors.
- 16.3.2 The definition of glint and glare can vary; however, the definition used within this assessment is as follows:
- a. ‘Glint’ refers to a momentary flash of light; and
 - b. ‘Glare’ refers to a continuous source of bright light.
- 16.3.3 The full study on glint and glare, undertaken for the Scheme by Neo Environmental, is available in **Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**. The Glint and Glare Assessment assumes a single axis tracker system with panels tracking from east to west throughout the day. As fully described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]** the panels will be at a maximum height of 3.5 m when at maximum tilt. The tilt will range from +60 to -60 degrees throughout the day.
- 16.3.4 The Glint and Glare Assessment **Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]** has been based on the Indicative Site Layout Plan (**Figure 2-3, ES Volume 3 [EN010143/APP/6.3]**) so that a specific solar PV setup can be modelled. However, the flexibility to the layout of the solar panels at detailed design allowed by the design parameters and Rochdale Envelope described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]** would not change the conclusions of the assessment as the footprint of the developable area (extent of solar panel placement) will not increase in size at detailed design. Therefore, a worst-case scenario has been assessed within the Glint and Glare Assessment, resulting in no change of conclusions should there be any minor alterations in panel layout at the detailed design stage.

Legislation, Policy and Guidance – Glint and Glare

- 16.3.5 There is no legislation relevant to Glint and Glare specifically. Planning policy and guidance relating to Glint and Glare which is pertinent to the Scheme comprises of the documents listed below. More detailed information can be found in **Appendix 16-1, ES Volume 2 [EN010143/APP/6.2]**. In summary, it comprises:

National Policy – Glint and Glare

- a. National Policy Statement for Energy (EN-1) (2011) (Ref. 16-20); and
- b. Draft National Policy Statement for Renewable Energy Infrastructure (Draft EN-3) (2023) (Ref. 16-21)

Local Policy – Glint and Glare

- a. East Riding Local Plan (LP) update 2020 – 2039 (Ref. 16-22).

Guidance – Glint and Glare

- a. National Planning Practice Guidance – Renewable and Low Carbon Energy (Ref. 16-23);

- b. Interim Civil Aviation Authority (CAA) guidance – Solar Photovoltaic Systems (Ref. 16-24);
- c. CAA – CAP738: Safeguarding Aerodromes 3rd Edition (Ref. 16-25);
- d. US Federal Aviation Authority (FAA) Administration Policy (Ref. 16-26);
- e. FAA Policy: Review of Solar Energy Systems Projects on Federally Obligated Airports (Ref. 16-27);
- f. Overview of Rail Safety and Standards Board Guidance (RSSB) (Ref. 16-28and
- g. Building Research Establishment (BRE) (2014). Planning guidance for the development of large scale ground mounted solar PV systems (Ref. 16-29).

Consultation – Glint and Glare

- 16.3.6 A scoping exercise was undertaken in summer/autumn 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.3.7 The **Scoping Report (Appendix 1-1, ES Volume 2 [EN010143/APP/6.2])** was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Glint and Glare.
- 16.3.8 The **Scoping Opinion** was received on 20 October 2022 (**Appendix 1-2, ES Volume 2 [EN010143/APP/6.2]**). Full details of the feedback received from stakeholders at scoping and Applicant responses in relation to Glint and Glare are presented in **Appendix 1-3, ES Volume 2 [EN010143/APP/6.2]**. This is also summarised in **Table 16-13** which outlines how and where these issues have been addressed within this ES to ensure they are taken into account as part of the assessment of Glint and Glare.

Table 16-13. Scoping opinion responses (Glint and Glare)

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	<p>The Applicant proposes to scope out a standalone ES chapter on glint and glare. The Scoping Report notes (in paragraph 16.3.12 that glint and glare calculations will be provided in a separate technical appendix and results will be incorporated into the Proposed Development design. Results will be considered within other aspect chapters where appropriate, and the assessment will be summarised in the ‘Other Environmental Topics’ chapter of the ES.</p> <p>The Inspectorate is content that glint and glare do not need to be assessed in a standalone chapter, however both matters should be addressed in other relevant aspect chapters and supported by detailed calculations as appropriate.</p>	<p>A Glint and Glare Assessment has been produced as an appendix to this chapter. The Glint and Glare Assessment has been summarised in within this chapter.</p>	<p>Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]</p>
Planning Inspectorate	<p>The Applicant proposes to scope out glint and glare effects during the construction and decommissioning phases on the basis that any effects would be temporary and localised in nature and would be minimised by measures outlined within the CEMP. The Inspectorate is content with this approach.</p>	<p>Measures to minimise glint and glare during construction are set out in the Framework CEMP.</p> <p>Consequently, Glint and Glare effects at construction and decommissioning are not considered further within the ES report.</p>	<p>Framework CEMP [EN010143/APP/7.7]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	<p>The Applicant proposes to scope out impacts of glint and glare on aviation on the basis that there is no evidence that glint and glare for solar farms interferes in any way with aviation navigation or pilot and aircraft visibility or safety as stated within the Draft National Policy Statement (NPS) EN-3.</p> <p>The Inspectorate considers that this matter may be scoped out from further consideration, however the description of development should explain how the panel design prevents the likelihood of glint and glare.</p>	<p>It is noted that the Planning Inspectorate has agreed that impacts to aviation can be scoped out. However, for completeness aviation receptors were considered within the Glint and Glare Assessment, which showed there to be no significant effects</p>	<p>Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]</p>
Planning Inspectorate	<p>The Scoping Report identifies railways users as a potential glint and glare receptor, and the potential for glint and glare effects on trains to result in major accidents and/or disasters is included within Table 16-1. The Scoping Report makes no reference to the potential for glint and glare effects on boat users.</p> <p>The preliminary Zone of Theoretical Visibility (ZTV) (Figure 10-1) shows the potential for visibility of the site from parts of the Derwent and Ouse rivers. As such, the glint and glare assessment should consider the potential for effects on boats.</p>	<p>The Glint and Glare Assessment has shown there to be no impacts upon railway receptors.</p> <p>The Rivers Ouse and Derwent are greater than 1 km from the Solar PV Site and therefore lie outside the Study Area of the Glint and Glare Assessment. Following detailed modelling, the impacts upon other ground-based receptors (road, rail, residential and PRow) in much closer proximity to the Solar PV Site (within the 1 km Study Area) than the rivers are None. It can therefore be concluded that impacts upon the River Derwent and Ouse are unlikely to occur but if they were to, they would most likely be No Impact and no</p>	<p>Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	<p>The Scoping Report states that there is the potential for glint and glare effects on residential and road receptors up to 1 km from the site boundary. The Inspectorate is of the opinion that there is potential for glint and glare effects to occur at a greater distance and that the ES should assess the potential for significant glint and glare effects to occur over wider distances. The study area used should be based on potential for significant effects to occur rather than an arbitrary distance. The Applicant is advised to use the ZTV developed for the Landscape and Visual Impact Assessment (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. The locations of the sensitive receptors should be shown on an accompanying plan.</p> <p>The Applicant's attention is drawn to National Highways' (NH) and Network Rail's scoping consultation responses in relation to potential glint and glare effects on users of the strategic road network and railway infrastructure.</p>	<p>greater than Negligible and Not Significant.</p> <p>As the distance from a solar development increases, the intensity of glare decreases as the glare becomes spread over a wider area before eventually dissipating out. Also, given a single-axis tracking solar PV system is being used by the Scheme, the angle of incidence required for glare to occur is avoided at further distances than 1 km at ground-level. Furthermore, a 1 km Study Area for ground-based receptors has been accepted across the UK and Ireland. All ground-based receptors (including the Hull to Selby railway line) within 1 km of the Solar PV Site were assessed. This showed that there would be No Impacts within this area; therefore it can be extrapolated that any ground-based receptors located further than 1 km will most likely experience No Impact and no greater than Negligible and Not Significant.</p>	Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	Modelling is proposed to assess the potential for glint and glare effects. Paragraph 2.3.12 of the Scoping Report notes that either fixed or tracker mounting structures could be used for the solar arrays. Given that the two different mounting structures are likely to lead to different glint and glare effects, the assessment should ensure that it assesses each of the Worst Case Scenarios.	Tracker panels were used within the assessment as these are the only type of panels that will be used. Chapter 2 of this ES provides further details	Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2] Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]
Foggathorpe Parish Council	Residential properties should also be considered when assessing the impact of glint and glare.	Residential properties were considered as sensitive receptors within the Glint and Glare Assessment.	Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]
Foggathorpe Parish Council	Can the EIA please include each residence within the scheme as a "sensitive receptor" in this analysis and provide a list of each residence that will experience glint and glare as an appendix of the EIA.	The Residential Receptor Map provided with the Glint and Glare Assessment (Appendix 16-2) illustrates all residential receptors included in the assessment. Where there are residential receptors near each other (less than 200 m), they have been grouped within a residential area and assessed appropriately. This is standard good practice for Glint and Glare assessments.	Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]
Foggathorpe Parish Council	Can the EIA please identify any and all footpaths or walking routes, that will be adversely affected by the scheme in such a way that residents will lose access to these walking routes, or that the scheme will	All Public Rights of Way (PRoW) and Permissive Paths to be created by the Scheme within the vicinity of the Solar PV Site were included as part of the Glint and Glare Assessment . These are identified on	Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>render them so unpleasant from heat, loss of character and views, glint and glare, that nobody will want to use these footpaths. Please list all adversely affected footpaths as an additional Appendix in the EIA.</p>	<p>the PRoW Receptor Map that accompanies the Glint and Glare Assessment (Appendix 16-2). Overall impacts were found to be None and therefore No Significant Effects.</p>	
<p>National Highways Jacobs Systra Joint Venture (JSJV)²</p>	<p>When considering glint and glare, it is considered that the following information should be provided within each application:</p> <ul style="list-style-type: none"> • Outline of the site context, including location, proximity to the Strategic Road Network (SRN), topography and height above sea level; and • Outline of proposal details, including scale, site boundary, site map, mounting arrangements and orientation. 	<p>A Road Receptor Map accompanies the Glint and Glare Assessment (Appendix 16-2). This was created to clearly identify which roads within 1 km of the Solar PV Site have been assessed. The SRN mainly sits outside of the 1km Study Area used, however as there are no impacts within 1 km of the Solar PV Site, impacts beyond 1 km are not predicted to occur.</p> <p>Chapter 2: The Scheme provides details of the Scheme including the mounting arrangements and details of the panel orientation and arrangement. The panels are a single axis tracker system with panels tilting east to west during the day.</p> <p>The Order limits are shown on the Figures accompanying Appendix 16-2 and also on Figures 1-2 and 2-3 of the ES.</p> <p>The SRN is discussed in Chapter 13 of the ES.</p>	<p>Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])</p> <p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]</p> <p>Figure 1-2 and Figure 2-3, ES Volume 3 [EN010143/APP/6.3]</p> <p>Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1]</p>

² National Highways engaged Jacobs Systra Joint Venture (JSJV) to review the Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) and prepare a scoping opinion on their behalf.

Consultee	Summary of comment	How matter has been addressed	Location of response
National Highways (JSJV)	<p>It is considered by JSJV that the following information should be provided where it is considered that glint and glare has the potential to impact upon users of the SRN:</p> <ul style="list-style-type: none">• Overview of sun movements, including time, date, latitude and longitude, as well as the relative reflections;• Identification of potential receptors of concern;• Identification of representative locations approximately every 100 m along the surrounding road network where the solar development may be visible;• Undertake geometric calculations to determine whether a solar reflection may occur for each of the identified road-based receptors from the proposed development. A height of between 1.05m and 2.0 m should be added to the overall ground height at a particular location to reflect the estimated eye level of a road user, in line with the visibility envelopes in CD109;• Height differences between the solar panels and the SRN in question need to be considered;• Where it has been calculated that a reflection may occur for road receptors, consideration should be made of the	<p>Geometric analysis was conducted at a height of 1.5 m and every 200 m along the roads within 1 km of the Solar PV Site. This resulted in No Impacts being found on the road network. All model results can be found within the Glint and Glare Assessment.</p>	<p>Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>location of the solar reflection with respect to the location of the sun in the sky, its angle above the horizontal and the time of day at which a reflection could occur;</p> <ul style="list-style-type: none"> • Provide a breakdown of the significance of the impacts and determine whether the solar reflection is likely to be a significant nuisance or a hazard to safety; • Consider the influence of appropriate measures such as screening, revised use of materials and orientation to mitigate the potential impact on road users; and • Consider the impact on signage and gantries at the SRN which may impair driver decision-making. 		
<p>National Highways (JSJV)</p>	<p>There are a number of further considerations which the applicant will be required to consider:</p> <ul style="list-style-type: none"> • Does the panel elevation angle provided by the applicant represent the elevation angle for all of the panels within the development; • Does the assessment consider not only the reflection from panel faces, but also from the frame or reverse of the panel, as these can often be comprised of materials with reflective capability; 	<p>The worst-case panel details were used to inform the modelling presented in the Glint and Glare Assessment.</p> <p>The whole panel area was assumed to be reflective, to take into consideration other materials that could produce a reflection (i.e., metal supporting frames and structures).</p> <p>The Glint and Glare Assessment assessed 185 receptors across 14 roads within 1 km of the Solar PV Site.</p>	<p>Glint and Glare Assessment. Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<ul style="list-style-type: none"> Does the assessment consider an appropriate number of receptors, rather than a singular location; and Is street view imagery and satellite mapping used for the purpose of desk-based studies up to date. 	<p>No visibility assessment was required as the Glint and Glare Assessment showed no glare was possible.</p>	
Network Rail	<p>With reference to the protection of the railway, the Environmental Statement should consider any impact of the scheme upon the railway infrastructure and upon operational railway safety. It should include a Glint and Glare study assessing the impact of the scheme upon train drivers (including distraction from glare and potential for conflict with railway signals).</p>	<p>The Glint and Glare Assessment (Appendix 16-2) considered all parts of the Hull to Selby Railway within the 1 km Study Area, as shown on the Rail Receptors map which accompanies Appendix 16-2. The detailed modelling found there to be No Impacts upon rail receptors within 1 km of the Solar PV Site.</p>	<p>Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]</p>
Selby District Council	<p>Glint and glare has the potential to affect landscape and visual amenity. We would wish to see clear explanation of proposed methodology for the Glint and Glare assessment.</p>	<p>The Glint and Glare Assessment methodology presented within the Glint and Glare Assessment, Appendix 16-2 and is summarised in paragraphs 16.3.12 to 16.3.15 of this chapter</p>	<p>Appendix 16-2, ES Volume 2 [EN010143/APP/6.2] Paragraphs 16.3.12 to 16.3.15 of this chapter</p>

- 16.3.9 Further consultation in response to formal pre-application engagement was undertaken through the PEI Report, issued in May 2023. Responses to this statutory consultation are presented in **the Consultation Report [EN010143/APP/5.1]. Table 16-14** outlines the statutory consultation responses relating to Glint and Glare and how these have been addressed through the ES. No further consultation beyond this has been undertaken with respect to Glint and Glare.
- 16.3.10 Further detail on consultation can also be found in **ES Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1]**.

Table 16-14. Statutory Consultation responses (Glint and Glare)

Consultee	Summary of comment	How matter has been addressed	Location of response
Natural England	Natural England notes chapter 16, section 16.3 advises that glint and glare impacts from the panels will be considered in the ES, however the potential for impacts on birds is not listed as a consideration. We advise the potential for the solar panels to affect flight paths of wintering and passage Lower Derwent Valley SPA and Humber Estuary SPA birds which are utilising functionally linked land should be assessed within the Habitats Regulations Assessment (HRA).	This is not a consideration within Glint and Glare Assessment. All impacts upon birds from The Scheme have been assessed within Chapter 8: Ecology of this ES . The HRA discusses the impacts of glint and glare on ornithology based on research projects and monitoring at operational solar farms in the UK and internationally. This has been discussed in the HRA [EN010143/APP/7.12] in terms of effects on flight paths and impacts on functionally linked land.	Chapter 8: Ecology, ES Volume 1 [EN010143/APP/6.1] Habitats Regulations Assessment [EN010143/APP/7.2]
National Highways	Considering the distance between the location of the proposed development and the SRN, JSJV consider it unlikely that matters relating to potential glint and glare impacts will incur any safety issue at the SRN for highway users. Nevertheless, JSJV welcome confirmation that the effect of glint and glare on the immediate landscape will be considered within forthcoming iterations of the EIA and Environmental Statement [ES], particularly as the specific locations of scheme buildout remain unconfirmed.	Road receptors within 1 km of the Solar PV Site have been assessed. A Road Receptor Map accompanies the Glint and Glare Assessment (Appendix 16-2) . This was created to clearly identify which roads within 1 km of the Solar PV Site have been assessed. The SRN mainly sits outside of the 1 km study area used, however as there are no impacts within 1 km of the Solar PV Site, impacts beyond 1 km are not predicted to occur.	Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])
North Yorkshire Council	Glint and Glare Assessment - we would recommend further consideration / clarity on time periods, method and criteria used	The Glint and Glare Assessment (Appendix 16-2) has assessed impacts upon Residential, Road, PRoW, Rail and Aviation receptors. The	Glint and Glare Assessment (Appendix

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>(e.g. whether these are annual / daily average times and how these will take account of seasonal variation). Also, that consideration is given to the assessment of other sensitive receptors as assessed and identified in the LVIA such as PRow (not only residential amenity).</p>	<p>methodology used can be seen within the Glint and Glare Assessment.</p> <p>Overall, all impacts were found to be None for ground-based receptors (Residential, Road, PRow and Rail) and Low for Aviation receptors.</p>	<p>16-2, ES Volume 2 [EN010143/APP/6.2]</p>
<p>Leeds City Council</p>	<p>We query the impact of the proposal on the aviation interests associated with Leeds Bradford International Airport and private airfields within Leeds. We would wish to see the impacts on aviation considered within any future application, taking account of the potential for glint and glare, impact on approach and take-off, and radar. We would recommend that you undertake pre-application discussions with all public and private airfields within Leeds, in addition to the CAA, NATS and the MOD Defence Estates.</p>	<p>The Glint and Glare Assessment (Appendix 16-2) has assessed the impact upon aviation receptors. Four runway approach paths and one Air Traffic Control Tower (ATCT) were assessed in detail at Brighton Airfield and Leeds East Airport. Only Green Glare (Low-Potential for after-image) impacts were predicted for Runway 28 at Brighton Airfield, green glare impacts on approach is an acceptable impact according to US Federal Aviation Administration (FAA) guidance. No impacts were recorded for the other receptors. Overall aviation impacts are Low and Not Significant.</p>	<p>Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])</p>
<p>Network Rail</p>	<p>Key concerns will include how the scheme impacts on railway operations in terms of glint and glare issues causing distraction for train drivers approaching and passing the site. We do note that information supplied in the PEI Report documentation (Section 16) suggests further information will be forthcoming in this regard as the</p>	<p>The Glint and Glare Assessment (Appendix 16-2) considered all parts of the Hull to Selby Railway within the 1 km Study Area, as shown on the Rail Receptors map which accompanies appendix. The detailed modelling found there to be No Impacts upon rail receptors within 1 km of the Solar PV Site.</p>	<p>Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>scheme progresses and we look forward to being able to review this information in due course. We will also need to know how any Glint and Glare issues that may arise are to be mitigated. Further issues we require detail of would include (but not necessarily be limited to) the management of construction works around the operational railway and details such as boundary treatments, any lighting and drainage schemes that may impact on the operational railway.</p>		
<p>East Riding of Yorkshire Council</p>	<p>Glint and Glare – The proposal has the potential to result in Glint and Glare that should be considered as part of any future application although is not anticipated to have a significant effect on aviation safety in this case. A good landscaping scheme would assist to prevent Glint and Glare to neighbouring residents as well as users of the public highway and public rights of way network.</p>	<p>The Glint and Glare Assessment (Appendix 16-2) has assessed impacts upon Residential, Road, PRoW, Rail and Aviation receptors. The methodology used can be seen within the Glint and Glare Assessment.</p> <p>Overall, all impacts were found to be None for ground-based receptors (Residential, Road, PRoW and Rail) and Low for Aviation receptors.</p>	<p>Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])</p>

Assessment Methodology – Glint and Glare

- 16.3.11 The assessment methodology is fully detailed within the **Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2])**.
- 16.3.12 In summary, the assessment methodology is a multi-step process of elimination to determine which receptors have the potential to experience the effects of glint and glare, which includes the following:
- a. Identifying receptors in a study area surrounding the Solar PV Site. The study area varies on the type of receptor:
 - i. Ground-based receptors, including residential, road, railway and PRow, within 1km of the Order limits; and
 - ii. Aviation receptors within 30km, with detailed assessment for large international aerodromes within 20km, military aerodromes within 10km and 5km for small aerodromes;
 - 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 will it 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 set out in section 16.3.10.

Static Receptors

- 16.3.13 Although there is no specific guidance set out to identify the magnitude of impact from solar reflections, the following criteria has been set out for the purposes of this report:
- a. **High** – Solar reflections impacts of over 30 hours per year or over 30 minutes per day;
 - b. **Medium** – Solar reflections impacts above 20 hours but below 30 hours per year or above 20 minutes but below 30 minutes per day;
 - c. **Low** – Solar reflections impacts up to and including 20 hours per year or up to 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.
- 16.3.14 The following criteria has been set out for Road, Rail, and PRow receptors:
- a. **High** - Solar reflections impacts with yellow glare (potential for after-image);
 - b. **Low** - Solar reflections impacts with only green glare (low potential for after-image); and

- c. **None** - Effects not geometrically possible or no visibility of reflective surfaces likely due to high levels of intervening screening or being outside drivers' field of view.
- 16.3.15 The following criteria has been set out for Aviation receptors:
- a. **High** - Solar reflections impacts with yellow glare on approach paths / any glare impacts upon Air Traffic Control Towers (ATCT) (potential for after-image);
 - b. **Low** - Solar reflections impacts with only green glare on approach paths (low potential for after-image); and
 - c. **None** - Effects not geometrically possible or no visibility of reflective surfaces likely due to high levels of intervening screening (ATCT only) or being outside pilots' field of view.

Approach

- 16.3.16 The modelling is based on worst-case principles, not considering obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, vegetation, hills, buildings, etc, and assuming clear skies at all times, therefore not accounting for meteorological effects such as cloud cover, fog, or any other weather event which may screen the sun. The model is therefore setup conservatively and is likely to overestimate the real-real impacts.

Baseline Conditions – Glint and Glare

Receptors

Residential Receptors

- 16.3.17 Residential receptors located within 1 km of the Solar PV Site have been considered in the assessment. Glint was assumed to be possible if the receptor is located within the ground-based receptor zones outlined in **Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**.
- 16.3.18 Where there are a number of residential receptors within close proximity, a representative dwelling or dwellings was 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 173 residential receptors have been assessed as shown in Figure 1 of the **Glint and Glare Assessment Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**.

Road, Rail and PRow Receptors

- 16.3.19 Roads that are within 1km of the Order limits and have potential views of the panels are considered in the assessment. 14 roads within the Study Area require a detailed assessment and these include: the A163, B1228, Willitoft Road, Wood Lane, Rowlandhall Lane, Green Lane, A63, Bring Lane, Station Road, Spaldington Lane, A614, Portington Road, Tottering Lane and Bell Lane. The assessment of these includes 185 receptor points along the 14 assessed roads within the study area. These points are 200m apart to ensure that each road is sufficiently covered within the assessment.

- 16.3.20 There are some minor roads which serve dwellings that have been screened out as the densities on these roads/access tracks will be very low and likely to get used to get to and from houses at the end of these tracks. Therefore, there is a negligible risk of safety impacts resulting from glint and glare of the Scheme.
- 16.3.21 There is one railway line, the Hull to Selby line, that dissects the Scheme (forming the boundary between Solar PV Areas 3b and 3c) which will require assessment. This includes 27 rail receptor points for assessment.
- 16.3.22 All PRoW within 1 km of the Scheme, including the proposed Permissive Paths in Solar PV Area 1e which would be created by the Scheme, have been considered. As explained previously this includes bridleways and the assessment therefore considers both pedestrians and horse riders. This includes 229 PRoW receptor points for assessment.

Aviation Receptors

- 16.3.23 The safeguarding buffer zones of the 14 aerodromes within 30 km of the Solar PV Site were investigated. The Solar PV Site is only located within the safeguarding buffer zones of Brighton Airfield and Leeds East Airport and therefore these receptors were subject to detailed assessment.

River Derwent and Ouse

- 16.3.24 Although the Grid Connection Corridor crosses both the River Derwent and River Ouse, they are approximately 1.4 km and 3.0 km respectively from the Solar PV Site, at their closest points. As they lie outside of the 1.0 km Study Area detailed modelling was not undertaken for these receptors. However, the results for the closer receptors are considered as a proxy.

Embedded Mitigation – Glint and Glare

- 16.3.25 The model used in the Glint and Glare Assessment 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, vegetation, hills, buildings, etc. As such the embedded mitigation considered in the assessment is restricted to the careful siting of the Scheme in the landscape with offsets from existing residential areas, vegetation patterns and road networks.
- 16.3.26 The rows of solar PV panels will be oriented in a north to south direction and rotate east-west along a single axis to maximise solar gain throughout the day and during the year (i.e., they will rotate east to west to track the movement of the sun). The panels will have a maximum tracking angle of 60 degrees and the axis tilt will vary throughout the site depending on the lay of the land. For example, when the sun is lower on the horizon (dusk/dawn) the panel position will be nearer vertical, whereas when the sun is high in the sky (midday) the panel position will be near horizontal. This type of panel generally attenuates most glint and glare effects by avoiding the angles of incidence with the sun that most likely cause glint and glare; modelling is required to validate this and check there are not exceptions where significant effects occur, but the nature of development (which is single axis tracker panels) is expected to provide embedded mitigation.

Assessment of Likely Impacts and Effects – Glint and Glare

- 16.3.27 Solar reflections are possible at none of the 173 residential receptors assessed within the 1 km study area. Therefore, overall impacts on residential receptors are considered to be **None**.
- 16.3.28 Solar reflections are possible at none of the 185 road receptors assessed within the 1 km study area. Therefore, overall impacts on road receptors are considered to be **None**.
- 16.3.29 Solar reflections are possible at none of the 27 rail receptors assessed within the 1 km study area. Therefore, overall impacts on rail receptors are considered to be **None**.
- 16.3.30 Solar reflections are possible at none of the 229 PRow receptors assessed within the 1 km study area. Therefore, overall impacts on PRow receptors are considered to be **None**.
- 16.3.31 Following detailed modelling, the impacts upon ground-based receptors (road, rail, residential and PRow) in much closer proximity to the Solar PV Site (within the 1 km Study Area) than the River Derwent and River Ouse were classed as None. It can therefore be concluded that impacts upon the River Derwent and Ouse are unlikely to occur but if they were to, they would be no greater than **Negligible** and **Not Significant**.
- 16.3.32 Four runway approach paths and one ATCT were assessed in detail at Brighton Airfield and Leeds East Airport. Only 'Green Glare' impacts (which is where there is a low potential for an 'after image') were predicted for Runway 28 at Brighton Airfield, which is an acceptable impact upon runways according to FAA guidance. The other receptors experience None. Overall aviation impacts are Low and Not Significant.

Additional Mitigation, Enhancement, and Monitoring – Glint and Glare

- 16.3.33 **Low and No Impacts** found for aviation and ground-based (residential, road, rail and PRow) receptors, respectively and therefore no additional mitigation measures are required to reduce glint and glare impacts. The embedded mitigation, particularly the nature of the Scheme which is single axis tracker panels, is considered adequate to avoid likely significant effects on glint and glare.
- 16.3.34 However, it is noted that whereas the model used in the assessment does not take account of obstacles between the observation points and the Solar PV Panels, there is a network of existing vegetation which will be conserved and enhanced, and a scheme of additional planting will be undertaken. These measures will be secured through the **Framework Landscape and Ecological Management Plan (LEMP) [EN010143/APP/7.1]**.
- 16.3.35 Therefore, although the modelling considers an unscreened site, additional mitigation in the form of existing and proposed planting will be in place.

Residual Effects – Glint and Glare

- 16.3.36 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 one runway

approach path, whilst the remaining aviation receptors are predicted to have **No Impacts**. Impacts upon ground-based receptors are predicted to be **None**. Therefore, the overall effects are considered to be **Negligible**.

Cumulative Effects – Glint and Glare

- 16.3.37 Following a review of the shortlisted cumulative developments presented in **Appendix 17-1, ES Volume 2 [EN010143/APP/6.2]** there are no other solar developments located within 2 km of the Solar PV Site to cause any potential cumulative effects to ground-based receptors, based on each having a maximum 1 km zone of influence. Therefore, these effects can be assumed to be **Negligible** or **None**.
- 16.3.38 Cumulative effects on aviation receptors are not assessed as effects are based upon the intensity of glare; and multiple sources of glare do not increase the intensity.

16.4 Ground Conditions

Phase 1 Preliminary Risk Assessment – Ground Conditions

- 16.4.1 A Phase 1 Preliminary Risk Assessment (PRA) has been carried out for the Scheme. This is equivalent to a Stage 1 Tier 1 level of assessment, as defined by the Environment Agency's Land Contamination Risk Management (LCRM) (2020) guidance (Ref. 16-30). The objective of the Phase 1 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 (CSM) that can be used to inform future decision making and the design of future ground investigation which may be required.
- 16.4.2 A **Phase 1 PRA Report** was prepared in May 2023 and included in the Preliminary Environmental Information Report (PEI Report). The **Phase 1 PRA** assessed the land within the Site Boundary at PEI Reporting stage, and is available in **Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**. The Site Boundary considered in the Phase 1 PRA and associated mapping therefore differs slightly from the Order limits adopted in the ES. The boundary changes between the PEI Report (as reflected in the PRA) and the ES are further discussed in **Chapter 3: Alternatives and Design Evolution, ES Volume 1 [EN010143/APP/6.1]** and shown in **Figure 3-6, ES Volume 3 [EN010143/APP/6.3]**. Land has been both added to and removed from the Site since the Phase 1 PRA was prepared, however the additional areas of land take are sufficiently covered by the buffer applied in the Phase 1 PRA. Therefore, the **Phase 1 PRA at Appendix 16-2** covers all relevant land within the Order limits and these boundary changes do not alter the conclusion of the assessment presented in the Phase 1 PRA.
- 16.4.3 The Phase 1 PRA includes the following:
- Description of the geology, hydrogeology and shallow mining potential;
 - Description of the environmental setting/sensitivity and current/historical land use of the Site and surrounding area;
 - Description of the findings of a site reconnaissance visit;
 - Provide an initial CSM for the prevailing ground conditions; and
 - Using the source-pathway-receptor model present a preliminary qualitative risk assessment of potential land contamination risks to human (chronic), environmental and controlled water receptors from contamination sources on or in the vicinity of the Site.

Consultation – Ground Conditions

- 16.4.4 A scoping exercise was undertaken in September 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.4.5 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Ground Conditions.

16.4.6 The Scoping Opinion was received on 20 October 2022 (**Appendix 1-2, ES Volume 2 [EN010143/APP/6.2]**). The feedback received from stakeholders at scoping and Applicant responses in relation to Ground Conditions are presented in **Appendix 1-3, ES Volume 2 [EN010143/APP/6.2]**. This is also summarised in **Table 16-15**.

Table 16-15. Scoping opinion responses (Ground Conditions)

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	Maintenance and operational activities are proposed to be scoped out. The Inspectorate agrees that the presence of chemicals such as oils, grease, fuels, lubricants and cleaning agents associated with the operation and maintenance of the facility are unlikely to result in significant effects. The Inspectorate expects that the ES will explain why the operational development will not give rise to routine emissions of chemicals. Furthermore, the Inspectorate requires that an outline of the Operational Environmental Management Plan (OEMP) is submitted with the DCO Application.	<p>This is noted and it is confirmed that a Framework OEMP [EN010143/APP/7.8] is submitted as part of the DCO Application.</p> <p>The operational development will not give rise to routine emissions of chemicals considering that the activity on the Solar PV Site will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, periodic fence inspection, and monitoring to ensure the continued effective operation of the Scheme.</p>	<p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1] describes the operation and maintenance of the Scheme, and that no routine use of chemicals is required.</p> <p>The Framework OEMP [EN010143/APP/7.8].</p>
Planning Inspectorate	The Scoping Report states that once the results of the PRA are known, and together with the proposed mitigation including a Framework CEMP, it is likely that it will be possible to demonstrate no Likely Significant Effects (LSE) during construction and decommissioning of the Proposed Development in which case the ES would not include a specific	The Phase 1 PRA (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]) has demonstrated no LSE during construction and decommissioning of the Scheme and therefore a specific chapter has not been included within the ES.	Consideration of Ground Conditions remains as a section in the Other Environmental Topics chapter of the ES. The Phase 1 Preliminary Risk Assessment Findings section of this chapter contains explanation of how the conclusion of no LSE has been reached.

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>chapter on this aspect. The Inspectorate considers that this approach is acceptable but if this matter is ultimately scoped out, the ES should still include an explanation as to how the conclusion of no LSE has been reached.</p>		
<p>Planning Inspectorate</p>	<p>The Inspectorate is satisfied that minerals safeguarding assessment may be scoped out subject to confirmation that the Minerals Planning Authority (MPA) agree to the suggested approach and that there would not be an LSE on minerals resources.</p> <p>Any implications for ground conditions arising from adherence to those comments should be addressed within the ES by cross-referencing the relevant information within the aspect chapters.</p>	<p>North Yorkshire County Council and East Riding of Yorkshire Council (as the relevant MPAs at the time of the consultation³) confirmed that impacts to minerals safeguarding can be scoped out of the impact assessment as no LSE will occur.</p>	<p>Appendix 12-2, ES Volume 2 [EN010143/APP/6.2] contains correspondence with North Yorkshire County Council and East Riding of Yorkshire Council (as the relevant MPAs at the time of the consultation³) confirming that impacts to minerals safeguarding can be scoped out of the impact assessment as no LSE will occur.</p> <p>The Planning Statement [EN010143/APP/7.2] sets out how the Scheme complies with relevant mineral planning policy and will not result in the sterilisation of mineral resources.</p>
<p>Environment Agency</p>	<p>The ground conditions section of the Scoping Report references the Guidance on Land Contamination</p>	<p>In line with the Environment Agency’s Land Contamination Risk Management (LCRM) guidance,</p>	<p>The Phase 1 PRA Report is provided as Appendix 16-2, ES Volume 2 [EN010143/APP/6.2].</p>

³ The Scheme lies within the administrative areas of East Riding of Yorkshire Council and the newly formed Unitary Authority of North Yorkshire Council. North Yorkshire Council was formed on 1 April 2023 by the merger of the administrative areas of North Yorkshire County Council and its six constituent District Councils. Therefore as the consultation was undertaken prior to the merger and the formation of the Unitary Authority, North Yorkshire County Council was the relevant MPA at the time of consultation.

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>Risk Management, indicating that the first step will be a preliminary risk assessment. The applicant should ensure that this guidance is followed. We recommend that developers should:</p> <ul style="list-style-type: none"> • Follow the risk management framework provided in Land Contamination: Risk Management, when dealing with land affected by contamination. • Refer to our Guiding principles for land contamination for the type of information that we require in order to assess risks to controlled waters from the site - the local authority can advise on risk to other receptors, such as human health. • Consider using the National Quality Mark Scheme for Land Contamination Management which involves the use of competent persons to ensure that land contamination risks are appropriately managed. • Refer to the contaminated land pages on Gov.uk for more information. 	<p>assessment of land contamination has taken the form of a tiered, risk-based approach, with the first step being a Phase 1 PRA.</p> <p>The Phase 1 PRA is based on a desktop study of available information to identify potential sources of contamination, receptors to contamination and potential pathways between them. The identified sources, pathways and receptors are presented in the form of an initial Conceptual Site Model showing the potential contaminant linkages.</p> <p>Environment Agency Guiding principles for land contamination (Ref. 16-31) have been considered for the type of information required in order to assess risks to controlled waters from the Site.</p>	

Consultee	Summary of comment	How matter has been addressed	Location of response
Canal and Rivers Trust	<p>Works in proximity to the River Ouse have the potential to increase the risk of pollution to the river through the runoff of silt-laden deposits or the release of dust. There is a significant risk of contamination through poor sediment management from exposed soils, with specific risks likely associated with drilling works in proximity to the river. Paragraph 16.4.7 [of the Scoping Report] outlines a list of measures to help address pollution risks. The Framework CEMP, discussed in paragraph 16.4.6 [of the Scoping Report], would be expected to provide adequate information to ensure that the mitigation measures are adequate. We understand that this will be made available at submission of the application, and we would wish to review this and provide further comment at that stage.</p>	<p>A Framework CEMP is included with the DCO Application and presents measures to minimise the risk of silt-laden run off, spillage of chemicals or oils and air borne dust emissions.</p> <p>Measures relevant to works in proximity to rivers include:</p> <ul style="list-style-type: none"> • 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. • 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. 	<p>A Framework CEMP [EN010143/APP/7.7] is submitted as part of the DCO Application with delivery of a detailed CEMP prior to construction secured through the DCO.</p>

- 16.4.7 Further consultation in response to formal pre-application engagement was undertaken through the PEI Report, issued in May 2023. Responses to this Statutory Consultation are presented in the **Consultation Report [EN010143/APP/5.1]**. **Table 16-16** outlines the statutory consultation responses relating to Ground Conditions and how these have been addressed within the ES.
- 16.4.8 Further detail on consultation can also be found in **Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1]**.

Table 16-16. Statutory consultation responses (Ground Conditions)

Consultee	Summary of comment	How matter has been addressed	Location of response
Canal and River Trust	In order to protect the structural integrity of the River Ouse bed, we request that boreholes should be undertaken to verify the strata of the ground. The boreholes need to be at least 5m below the river bed level. This would be required to demonstrate that the ground under the river is suitable for drilling.	A geotechnical site investigation, to be undertaken post-consent, as secured by the Framework CEMP . The results of the geotechnical site investigation will be used to inform the design of the HDD beneath the River Ouse. The scope of the geotechnical site investigation will cover the requirements of the Canal and Rivers Trust as described in their Statutory Consultation response. It is noted that as the HDD beneath the River Ouse is required to be installed a minimum of 5 m beneath the bed (as set out in the Outline Design Principles Statement [EN010143/APP/7.4]), the investigatory boreholes are required to be to at least this depth to prove the nature of the ground and correctly inform the drill methodology.	This table. Framework CEMP [EN/010143/APP/7.7] Protective Provisions for the benefit of the Canal and River Trust have been included within the draft DCO [EN010143/APP/3.1] at Part 4 of Schedule 14. Post-consent, any further approvals of plans will be governed by the terms of the Protective Provisions which include having regard to the Canal and River Trust's Code of Practice.
Environment Agency	We are pleased to note that our comments submitted at Scoping Stage have been taken into consideration throughout this [PEI Report] report.	Noted	Not applicable
Environment Agency	We understand the scheme to comprise of the construction, operation and decommissioning of a	A Framework CEMP [EN/010143/APP/7.7], Framework OEMP [EN010143/APP/7.8] and	A Framework CEMP [EN/010143/APP/7.7], Framework OEMP [EN010143/APP/7.8] and

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>solar photovoltaic electricity generating facility and energy scheme, and export connection to the national grid, at National Grid's Drax Substation. We look forward to reviewing further relevant documents to be developed, but unavailable at this time, including:</p> <ul style="list-style-type: none"> • The final CEMP • Water Management Plan • Framework Surface Water Drainage Strategy • Operational Environmental Management Plan (OEMP) • Quantitative Risk Assessment for land contamination. 	<p>Framework DEMP [EN010143/APP/7.9] are submitted with the DCO Application. Should consent be granted, these documents will be updated to final versions prior to the construction and operational phases, as secured through DCO Requirement, as further described in Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1].</p> <p>A Water Management Plan which includes details of pollution prevention will be prepared post-consent, secured by the Framework CEMP.</p> <p>A Framework Surface Water Drainage Strategy Appendix 9.4, ES Volume 2 [EN010143/APP/6.2] has been prepared for The Grid Connection Substations in Solar PV Area 1c. Following agreement with the Ouse and Humber Drainage Board that this is the only area of Site requiring such measures (see Chapter 9: Flood Risk Drainage and Water Environment of this ES and the Consultation Report).</p> <p>Site Investigation and Generic Quantitative Risk Assessment (GQRA), expected to be undertaken post-consent, are secured by the Framework CEMP.</p>	<p>Framework DEMP [EN010143/APP/7.9] are submitted with the DCO Application</p> <p>Framework Surface Water Drainage Strategy is included as (Appendix 9-4, ES Volume 2 [EN010143/APP/6.2])</p> <p>Framework CEMP [EN/010143/APP/7.7]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
<p>Environment Agency</p>	<p>We acknowledge that the Solar PV site is not known to have a significant history of potentially contaminating past uses, however, contamination has the potential to be present. It would be helpful to include details on the methodology to be adopted if unexpected contamination was found. Consider including this in the CEMP.</p> <p>We would welcome the planned ground investigation and testing followed by a Quantitative Risk Assessment in the Grid Connection Corridor.</p> <p>The following recommendations could be useful in the development of the investigation:</p> <ul style="list-style-type: none"> • Follow the risk management framework provided in Land Contamination: Risk Management, when dealing with land affected by contamination. • Refer to our Guiding principles for land contamination for the type of information that we require in order to assess risks to controlled waters from the site. The local authority can advise on risk to 	<p>A methodology to be adopted if unexpected contamination is found is included in the Framework CEMP [EN010143/APP/7.7]</p> <p>The Framework CEMP [EN010143/APP/7.7] sets out that site investigation (where required, for example in areas of potential contamination and to inform HDD design) and GQRA to be undertaken post-consent. The delivery of these items is therefore secured through the Framework CEMP.</p> <p>The risk management framework provided in Land Contamination: Risk Management (LC:RM) (Ref. 16-30) and the Environment Agency guiding principles for land contamination (Ref. 16-31) will be considered in the development of the investigation.</p>	<p>A methodology to be adopted if unexpected contamination is found is included in the Framework CEMP [EN010143/APP/7.7]</p> <p>Site investigation and GQRA, to be undertaken post-consent where required, secured by the Framework CEMP [EN010143/APP/7.7]..</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>other receptors, such as human health.</p> <ul style="list-style-type: none"> Consider using the National Quality Mark Scheme for Land Contamination Management which involves the use of competent persons to ensure that land contamination risks are appropriately managed. Refer to the contaminated land pages on gov.uk for more information. We also welcome the use of the relevant guidance as stated in paragraph 9.9.61. 		
North Yorkshire Council	<p>Land contamination risks associated with the proposed Grid Connection Corridor are very low and no likely significant effects are anticipated. No further comments to make.</p>	<p>Noted</p>	<p>Noted</p>
Leeds City Council	<p>We do not know the mineral type located within the Mineral Safeguarding Area on which the proposal would be sited. Could you please identify this? Furthermore, it is acknowledged that the proposed development would form a temporary use of land and would therefore not sterilise the recovery of safeguarded mineral/s in perpetuity. That said, the</p>	<p>The Site is located within East Riding of Yorkshire’s Minerals Safeguarded Area EC6 and an area of safeguarded surface mineral resource in North Yorkshire (the deposits being described as Brick Clay and Sand and Gravel). Minerals Safeguarded Area EC6 is for sand and gravel, crushed rock, limestone, industrial chalk, clay and silica sand.</p>	<p>Appendix 12-2, ES Volume 2 [EN010143/APP/6.2] contains correspondence with North Yorkshire County Council and East Riding of Yorkshire Council (as the relevant MPAs) confirming that impacts to minerals safeguarding can be scoped out of the impact assessment as no LSE will occur. Discussion of Minerals safeguard areas is also contained in the Planning</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>proposed long duration of the proposal on the land could delay the opportunity to recover the mineral if it came to pass that national, regional and/or sub-regional mineral landbanks were depleting and needed maintaining, in accordance with the NPPF. We would recommend that you discuss this matter with East Yorkshire and North Yorkshire Councils and determine the health of each Local Authority's landbank. Separate to this, given that a large part of the proposal falls to be considered as an engineering operation, the sustainable policy precedent is for the mineral within the MSA to be removed incidental to the proposed groundworks (different perspectives may relate to the mineral if its Coal).</p>	<p>North Yorkshire County Council and East Riding of Yorkshire Council (as the relevant MPAs) confirmed that impacts to minerals safeguarding can be scoped out of the impact assessment as no LSE will occur.</p>	<p>Statement [EN010143/APP/7.2] which accompanies the DCO Application.</p>
<p>East Riding of Yorkshire Council</p>	<p>Land Contamination – A Phase 1 Preliminary Risk Assessment (PRA) Report has been provided as part of the Preliminary Environmental Information which accompanies the pre-application consultation. The PRA has not identified any significant</p>	<p>Noted</p>	<p>Noted</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>constraints to the proposed development as a result of land contamination.</p> <p>It is envisaged that additional investigation and risk assessment will be undertaken as part of the subsequent Environmental Impact Assessment for the Development Consent Order (DCO) application. Embedded best-practice mitigation measures are also proposed for dealing with contamination and managing soil and made ground during the project, as part of the site construction management plan.</p> <p>Therefore, based on the information available Public Protections Specialist Team have no objections to the proposed development, providing appropriate mitigation measures (both embedded and additional, as discussed in the PRA) are implemented, to manage potential risks from land contamination.</p> <p>The scheme comprises of 3 phases, namely construction, operation (including maintenance and repair) and decommissioning.</p>		

16.4.9 No further consultation has been undertaken for Ground Conditions.

Phase 1 Preliminary Risk Assessment Findings – Ground Conditions

16.4.10 The principle of risk assessment for land contamination is outlined in the Statutory Guidance to Part 2A (2012) (Ref. 16-32) and LC:RM (Ref. 16-30).

16.4.11 The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:

- a. Source: hazardous substance that has the potential to cause adverse impacts;
- b. Pathway: route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses; and
- c. Receptor: target that may be affected by contamination: examples include human occupants/ users of site, water resources (surface waters or groundwater), or structures.

16.4.12 For a risk to be present, there must be a relevant/viable contaminant linkage, i.e., a mechanism whereby a source impacts on a sensitive receptor via a pathway.

16.4.13 The following sources, pathways and receptors have been identified in **Table 16-17**.

Table 16-17. Sources, pathways and receptors (Ground Conditions)

Sources	Pathways	Receptors
<p>S1: On site, current and former farm buildings and yards where fuel and agricultural materials were/are stored. Made Ground (infilled ponds/infilled land) Discarded material and a stockpile of granular material (Solar PV Area 3c).</p>	<p>P1: Direct Pathway: direct contact, dermal absorption or ingestion of soil.</p> <p>P2: Indirect Pathway: inhalation of soil particulates or vapour derived from soils.</p> <p>P3: Indirect Pathway: migration of hazardous gases/vapours via permeable strata into confined spaces (asphyxiation/explosion).</p>	<p>R1: Construction and maintenance workers.</p> <p>R2: Current Site Users: farmers/site visitors/general public on the Site using the Public Rights of Way (PRoW).</p> <p>R3: Future Site Users: farmers/site visitors/trespassers/general public on the Site using the PRoW.</p>
<p>S2: Off site, current and former farm buildings and yards where fuel and agricultural materials were/are stored. Artificial Ground (Boothferry Golf Course & Spaldington Golf Range (adjacent east of Solar PV Area 2d and adjacent west of Solar PV Area 2e); and at Lake View House and Winfield Lakes).</p>	<p>P4: Direct Pathway: spillage/loss/run off from surface direct to receiving water.</p> <p>P5: Indirect Pathway: leaching of chemicals and vertical migration via permeable unsaturated strata to shallow groundwater.</p>	<p>R4: Adjacent site users during earthworks: neighbours in residential/commercial properties adjacent to the Site and general public in the areas adjacent the Site.</p> <p>R5: Secondary A Aquifers of superficial deposits (Brighton Sand Formation, Alluvium and Warp). Secondary B Aquifer of the bedrock (Mercia Mudstone Group). Principal Aquifer of the bedrock (Sherwood Sandstone Group).</p>
<p>S3: Off site, (between Solar PV Area 3c and Solar PV Area 3b; 80m north of Solar PV Area 1a) current and former railway lines.</p>	<p>P6: Indirect Pathway: lateral migration in groundwater and baseflow into surface waters.</p>	<p>R6: River Ouse; River Derwent; Fleet Dike; River Foulness; dikes, drains and ponds.</p>
<p>S4: Off site (adjacent north of Solar PV Area 2d), current industrial area, including: a licenced physical treatment facility; current Bunn Fertiliser Limited,</p>	<p>P7: Indirect Pathway: uptake via root system and ingestion.</p>	<p>R7: River Derwent SSSI and SAC.</p> <p>R8: Future proposed infrastructures (PV Mounting Structure and cables).</p>

Sources

Pathways

Receptors

former transport & storage; and current green energy supplier.	P8: Direct Pathway: direct contact of buried concrete with contaminated soils (i.e., hydrocarbons) and aggressive ground conditions (pH and sulphate).	R9: Proposed structures.
S5: Off site (between Solar PV Area 2e and Solar PV Area 2f), current warehouses (Filstorage National Distribution Centre); current field and garden machinery workshop, former household, commercial and industrial transfer station.	P9: Direct Pathway: direct contact of services and supply pipes with contaminated soils.	R10: Potable water supply pipes and other services.
S6: Off site (adjacent east of Solar PV Area 2g), former filling station.	P10: Indirect Pathway: Migration of hazardous gases/vapours via permeable strata into enclosed spaces and service/utility trenches.	
S7: Off site (adjacent north and north-west of Solar PV Area 2a), areas formerly occupied by the Brighton Airfield and historical landfill site (Brighton Landfill Site).		
S8: On site (Grid Connection Corridor), Made Ground (infilled pond) and marshland.		
S9: Off site (Grid Connection Corridor), Current railway lines and pumping station.		

Sources

Pathways

Receptors

S10: Off site (Grid Connection Corridor),
historical landfill site (New Road Landfill
Site).

S11: Off site (Grid Connection Corridor),
current Drax Power Station.

- 16.4.14 Using criteria broadly based⁴ on those presented in the section 6.3 of the CIRIA Report 'Contaminated Land Risk Assessment: A Guide to Good Practice' (CIRIA Report C552) (Ref. 16-33), the magnitude of the risk associated with potential contamination at the Site was assessed. To do this an estimate was made of:
- The magnitude of the potential consequence (i.e., severity); and
 - The magnitude of probability (i.e., likelihood).
- 16.4.15 The classifications of severity and likelihood and the risk rating based on the comparison of severity and likelihood are presented in the Phase 1 PRA report (**Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**).
- 16.4.16 The key findings of the risk assessment are detailed below. Full details outlining all the source-pathway-receptor linkages for all of the sources, pathways and receptors detailed above are provided in the Phase 1 PRA report (**Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**).
- 16.4.17 Risks to human health have been identified as between very low to moderate/low within the Phase 1 PRA. The highest risks have been identified in the areas surrounding the former Brighton Airfield, historical landfill sites and current Drax Power Station.
- 16.4.18 Risks to controlled waters have been identified as up to moderate within the Phase 1 PRA. The highest risks have been identified in the areas surrounding the former Brighton Airfield, historical landfill sites and current Drax Power Station.
- 16.4.19 The Phase 1 PRA proposes limited intrusive investigation to confirm the findings of the assessment which may be included as part of geotechnical scope of works. An intrusive site investigation and GQRA is proposed in the areas of potential contamination.

Conclusion – Ground Conditions

- 16.4.20 Following implementation of the recommendations of the GQRA (to be completed post-consent) into the detailed CEMP, along with the environmental design and management measures, for the construction, operation and decommissioning phases, the risk to human health and controlled waters is considered acceptable. Therefore, the Scheme is not considered to pose an unacceptable risk to human health or the environment either during construction, during operation or decommissioning. There is not expected to be any likely significant effects associated with Ground Conditions.
- 16.4.21 During construction, the works will be undertaken in compliance with CDM 2015 regulations (Ref. 16-34). Mitigation to prevent surface runoff, discharge into watercourses and dust generation will form part of the construction phase obligations and requirements.

Cumulative Effects – Ground Conditions

- 16.4.22 This section assesses the potential effects of the Scheme in combination with the potential effects of other proposed and committed plans and

⁴ CIRIA Report C552 was used to create the assessment criteria, however the terminology has been altered slightly for example through the use of likelihood rather than probability.

projects including other developments (referred to as 'cumulative schemes') within the surrounding area.

- 16.4.23 The cumulative schemes to be considered in combination with the Scheme have been agreed in consultation with relevant Local Planning Authorities and are listed in **Appendix 17-1, ES Volume 2 [EN010106/APP/6.2]**. The cumulative assessment methodology is presented within **Chapter 5: EIA Methodology, ES Volume 1 [EN010106/APP/6.1]**.
- 16.4.24 There are eight cumulative schemes in the vicinity (within a 1km buffer) of the Scheme which have the potential to result in cumulative ground contamination effects. These include (inter alia) developments for the installation of ground mounted solar arrays; a sub-surface cable route from Drax Power Station; a converter station at Drax; and pipelines; and will result in some degree of excavation or ground disturbance.
- 16.4.25 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 development, impacts to Ground Conditions will be controlled, and it is considered that the cumulative effect on ground conditions will be negligible and not significance.

16.5 Major Accidents or Disasters

Introduction – Major Accidents or Disasters

- 16.5.1 This section provides a description of the potential effects of the Scheme on the environment deriving from the vulnerability of the Scheme to risks of major accidents and/or disasters.
- 16.5.2 As set out in The IEMA guidance document ‘Major Accidents and Disasters in EIA: A Primer’ (Ref. 16-35):
- 16.5.3 “Accidents” are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g. a major emission, fire or explosion).
- 16.5.4 “Disasters” are naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).
- 16.5.5 This chapter is supported by the following appendices in **ES Volume 2 [EN010143/APP/6.2]**:
- a. **Appendix 16-1: Legislation, Policy and Guidance (Other Environmental Topics).**

Legislation, Policy and Guidance – Major Accidents or Disasters

- 16.5.6 The EIA Regulations (Ref. 16-36) require consideration to be given to the risks of major accidents and disasters. The Scheme is not subject to the Control of Major Accident Hazards (COMAH) Regulations (2015) (Ref. 16-37).
- 16.5.7 No specific provisions for the major accidents and disasters assessment are made within the NPSs or the Draft NPSs. Both NPS EN-1 (2011) (Ref. 16-8) and Draft EN-1 (2023) (Ref. 16-9) set out matters relating to safety, however this mainly applies to schemes which are subject to the COMAH Regulations.
- 16.5.8 Although not directly relevant to energy developments, the NPPF (2023) (Ref. 16-10) does refer, at paragraph 97, to the fact that “*planning policies and decisions should promote public safety and take into account wider security and defence requirements by a) anticipating and addressing possible malicious threats and natural hazards*”
- 16.5.9 There are no relevant local policy provisions in relation to major accidents and/or disasters.
- 16.5.10 The IEMA guidance document ‘Major Accidents and Disasters in EIA: A Primer’ (Ref. 16-35) has been taken into account in the assessment of major accidents or disasters.
- 16.5.11 Further details of the legislation policy and guidance relevant to this topic is presented in (**Appendix 16-1, ES Volume 2 [EN010143/APP/6.2]**).

Consultation – Major Accidents or Disasters

- 16.5.12 A scoping exercise was undertaken in summer/autumn 2022 to establish the content of the assessment and the approach and methods to be followed.

- 16.5.13 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Major Accidents and Disasters.
- 16.5.14 Following receipt of the Scoping Opinion on 20 October 2022 (**Appendix 1-2, ES Volume 2 [EN010143/APP/6.2]**) the requirements summarised in **Table 16-18** have been identified by consultees in relation to Major Accidents and Disasters. **Table 16-18** outlines how and where these issues have been addressed within this ES.
- 16.5.15 Further consultation in response to formal pre-application engagement was undertaken through the Preliminary Environmental Information Report (PEI Report), issued in May 2023. Responses to this statutory consultation are presented in the **Consultation Report [EN010143/APP/5.1]**. **Table 16 19** outlines the statutory consultation responses relating to Major Accidents or Disasters and how these have been addressed through this ES.
- 16.5.16 Further detail on consultation can also be found in **Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1]**.

Table 16-18. Scoping opinion responses (Major Accidents and Disasters)

Consultee	Summary of comment	How and where addressed	Location of Response
Planning Inspectorate	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.	Noted. The existing legal protection (legislation), which is considered to be sufficient to minimise any risk from major accidents or disasters to a reasonable level, is set out in paragraph and further discussed in Appendix 16-1, ES Volume 2 [EN010143/APP/6.2] .	See Appendix 16-1, ES Volume 2 [EN010143/APP/6.2] for existing legal protection legislation.
Planning Inspectorate	A number of events are proposed to be scoped out of further assessment and the reasons for that approach are set out in Appendix B of the Scoping Report. The Inspectorate agrees that these matters can be scoped out [of the assessment of Major Accidents and Disasters]. The Inspectorate notes that the scoping study area extends across the consultation zone of two Major Accident Hazard (MAH) sites (Spaldington Airfield and DRAX Power). The ES should include an assessment of the vulnerability of the Proposed Development to major accidents arising from the proximity to these MAH sites or otherwise explain why significant effects are not likely to occur.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) assesses the risk posed by the proximity of the Scheme to these sites and why significant effects are not likely to occur.	The assessment is presented in Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) (paragraphs 16.5.33 to 16.5.46).
Planning Inspectorate	The Scoping Report refers to an absence of established guidance for this aspect topic.	The methodology used in this ES report as taken account of	See paragraphs 16.5.17 to 16.5.28.

Consultee	Summary of comment	How and where addressed	Location of Response
	Reference should be made to the IEMA guidance document 'Major Accidents and Disasters in EIA', where relevant	the guidance set out in the IEMA guidance document (Ref. 16-35) where relevant.	
Planning Inspectorate	A standalone ES chapter for major accidents and disasters is not proposed on the basis that potential effects will be assessed in other ES chapters where relevant. The Inspectorate agrees with this approach, but notes that none of the other Scoping Report chapters make any reference to consideration of major accidents and disasters. The ES should clearly signpost where these impacts are assessed in other relevant chapters and where any relevant mitigation measures are secured, if required.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) presents an assessment of major accidents and disasters with other chapters signposted where relevant.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section).
Planning Inspectorate	Table 16-1 [of the Scoping Report] acknowledges that there is a potential fire risk associated with the battery storage element of the Proposed Development, which is reduced by automatic cooling and suppression systems designed to regulate temperatures to within safe conditions. The Inspectorate considers that the risk of battery fire/explosion should be addressed in the ES, including where any measures designed to minimise impacts on the environment in the event of such an occurrence are secured. The Inspectorate notes that a Framework Battery Fire Safety Management Plan is also proposed and	A Battery Energy Storage System (BESS) no longer forms part of the Scheme and therefore this is not assessed/considered within the ES and a Framework Battery Fire Safety Management Plan is no longer required.	Not applicable – BESS no longer part of the Scheme.

Consultee	Summary of comment	How and where addressed	Location of Response
	considers that this should be submitted as part of the DCO application.		
Planning Inspectorate	With regard to utilities failure, the Applicant's attention is drawn to the comments from the Health and Safety Executive (HSE) and Northern Gas Networks, noting the presence of several MAH pipelines within the scoping study area.	The Applicant is in contact with the owners of these assets and exact routings and information on appropriate clearances will be obtained to inform the detailed design of the Scheme. The Applicant has committed to measures such as the avoidance of the placement of solar panels directly above or within the easements of gas pipelines as illustrated in Figure 2-3 and discussed in Chapter 2 of this ES.	Figure 2-3, ES Volume 3 [EN010143/APP/6.3]. Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]
Planning Inspectorate	With regard to road and rail accidents, the Applicant's attention is drawn to the comments of National Highways and Network Rail regarding potential impacts from glint and glare.	As stated in section 16.3 of this chapter, the Glint and Glare assessment presented considers the potential impacts on local road, PRow, rail and waterway users, to aviation, and at residential dwellings.	See section 16.3 of this chapter.
Environment Agency	We are supportive of residual flood risks, such as flood defence failure, being included in the Flood Risk Assessment (FRA). Other residual risks are described in the PPG.	A Flood Risk Assessment (FRA) is presented as Appendix 9-3, ES Volume 2 [EN010143/APP/6.2] . The FRA includes flood modelling	The FRA is presented in Appendix 9-3, ES Volume 2 [EN010143/APP/6.2] .

Consultee	Summary of comment	How and where addressed	Location of Response
Northern Gas Networks (NGN)	<p>NGN has a number of gas assets in the vicinity of some of the identified “site development” locations. It is a possibility that some of these sites could be recorded as Major Accident Hazard Pipelines (MAHP), whilst other sites could contain High Pressure gas and as such there are Industry recognised restrictions associated to these installations which would effectively preclude close and certain types of development. NGN would expect you or anyone involved with the site (or any future developer) to take these restrictions into account and apply them as necessary in consultation with ourselves. We would be happy to discuss specific sites further or provide more details at your locations as necessary. If you give specific site locations, we would be happy to provide gas maps of the area which include the locations of our assets.</p>	<p>as agreed with the Environment Agency.</p> <p>Discussions between the Applicant and the owner of these assets are ongoing. Protective Provisions for the benefit of gas undertakers have been included within Part 1 of Schedule 14 of the Draft DCO [EN010143/APP/3.1] to afford protection to their interests. Further negotiations regarding these Protective Provisions will be undertaken should consent be granted. Exact routings and information on appropriate clearances (easements) will be obtained prior to any intrusive works and observed in the detailed design, as discussed in Chapter 2: The Scheme. Figure 2-3 illustrates that the layout of solar panels has been designed to leave easements above gas pipelines.</p>	<p>Protective Provisions are contained within Part 1 of Schedule 14 of the Draft DCO [ES010143/APP/3.1].</p> <p>Chapter 2: The Scheme, ES Volume 1 [ES010143/APP/6.1] and Figure 2-3 ES Volume 3 [ES010143/APP/6.3].</p>

Consultee	Summary of comment	How and where addressed	Location of Response
		It is noted that NGN have provided indicative mapping of the assets with their response.	

Table 16-19. Statutory consultation responses (Major Accidents or Disasters)

Consultee	Summary of comment	How matter has been addressed	Location of response
Environment Agency	When determining appropriate levels for any of the development shown to be located at risk, you should also consider historic flooding. It is noted that a Preliminary FRA has been produced and is included in appendix 09-03 (and that the full FRA is to be produced at ES stage and will include the detailed modelling currently under discussion).	Historic flooding evidence has been provided.	Chapter 9: Flood Risk, Drainage and Water Environment, ES Volume 1 [EN010143/APP/6.1] and Appendix 9-3 Flood Risk Assessment [EN010143/APP/6.2].
Health and Safety Executive	The Scheme crosses the Consultation Zones of two Major Accident Hazard (MAH) sites: <ul style="list-style-type: none"> ITS Inglis Transport Services Ltd, Spaldington Airfield (Grid Connection Corridor and Solar PV Areas 2b, 2c and 2d); and 	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) assesses the vulnerability of the Scheme to a major accident at these sites and why significant effects are not likely to occur.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) Consultation Report [EN010143/APP/5.1].

Consultee	Summary of comment	How matter has been addressed	Location of response
	<ul style="list-style-type: none"> DRAX Power Limited Grid Connection Corridor). <p>The Applicant should make contact with the above operators, to inform an assessment of whether or not the proposed development is vulnerable to a possible major accident.</p>	<p>The Applicant is in discussions with Drax Power as recorded in the Consultation Report [EN010143/APP/5.1].</p>	
<p>Health and Safety Executive</p>	<p>The Scheme crosses the following major accident hazard pipelines:</p> <ul style="list-style-type: none"> National Grid Gas PLC pipelines 7 Feeder Cawood/ Eastoft pipeline and 29 Feeder Ganstead to Asselby pipeline; and Northern Gas Networks (NGN) Asselby to Harswell pipeline. <p>The Applicant should make contact with the above operators.</p>	<p>Protective Provisions for the benefit of gas undertakers have been included within the draft DCO [EN010143/APP/3.1] at Part 1 of Schedule 14.</p> <p>Post-consent, any further approvals of plans will be governed by the terms of the Protective Provisions.</p> <p>Figure 2-3, ES Volume 3 [EN010143/APP/6.3] illustrates the routing of gas pipelines and illustrates that, where they occur within the Solar PV Site, an undeveloped strip (easement) has been included in the layout of solar panels.</p>	<p>Protective Provisions are set out in the DCO [ES010143/APP/3.1]. Draft DCO [ES010143/APP/3.1].</p> <p>Figure 2-3, ES Volume 3 [EN010143/APP/6.3]</p> <p>Chapter 2: The Scheme, ES Volume 1 [ES010143/APP/6.1].</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
		Exact routings and information on easements will be obtained through discussion with the asset owners prior to any intrusive works and observed in the detailed design, as discussed in Chapter 2: The Scheme, ES Volume 1 [ES010143/APP/6.1] .	
Health and Safety Executive	Due to the low number of staff and visitors at the operational phase, the Health and Safety Executive (HSE) would not advise against this nationally significant infrastructure project.	This is noted and reflected in the assessment provided in this chapter.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section)
Health and Safety Executive	The presence of hazardous substances on, over or under land at or above set threshold quantities (Controlled Quantities) will probably require Hazardous Substances Consent (HSC) under the Planning (Hazardous Substances) Act 1990 as amended.	The Scheme will not require the presence of hazardous substances above threshold quantities at construction, operation, or decommissioning phases.	Not applicable
Health and Safety Executive	Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017	This section of Chapter 16 provides an assessment.	Section 16.5 of Chapter 16, Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section)

Consultee	Summary of comment	How matter has been addressed	Location of response
	requires assessment of the expected significant effects arising from the proposed development's vulnerability to major accidents.		
Health and Safety Executive	The HSE has no comment on electrical safety from a planning perspective.	This is noted	Not applicable.
Health and Safety Executive	The HSE has no comment on explosives advice as there are no HSE licenced explosive sites in the vicinity of the proposed development	This is noted	Not applicable.
Northern Gas Networks	NGN having gas pipelines in the area of the proposed DCO application for the Solar Farm wish to register an objection to the development.	This is noted	This is noted
Northern Gas Networks	<p>NGN is a Licenced Gas Transporter and must guarantee supplied of gas to their customers.</p> <p>NGN are willing to work with the developers of the Solar Farm to agree how the effects of the development on the Gas Network can be mitigated</p> <p>As the discussions move forward it is likely NGN will look to agree a</p>	<p>Protective Provisions for the benefit of gas undertakers have been included within the draft DCO [EN010143/APP/3.1] at Part 1 of Schedule 14.</p> <p>Figure 2-3, ES Volume 3 [EN010143/APP/6.3] illustrates the routing of gas pipelines and illustrates that an undeveloped</p>	<p>Consultation Report [EN010143/APP/5.1].</p> <p>Protective Provisions are contained in the Draft DCO [EN010143/APP/3.1].</p> <p>See also Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1] and Figure 2-3, ES Volume 3 [EN010143/APP/6.3].</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>Private Asset Protection Agreement as we feel the standard provisions in a DCO do not give adequate protection.</p>	<p>strip (easement) has been included in the layout of solar panels.</p> <p>Exact routings and information on appropriate clearances (easements) will be obtained prior to any intrusive works and observed in the detailed design, as discussed in Chapter 2: The Scheme, ES Volume 1 [ES010143/APP/6.1].</p>	
<p>Northern Gas Networks</p>	<p>As this development will be in the vicinity of NGN High Pressure Pipelines it is also likely that a pipeline crossing deed will be required, this will not be limited to but will likely need to cover the following items:</p> <ul style="list-style-type: none"> -Confirm that the gas pipeline will have no solar panels placed over it and within the pipeline easement -Procedures for working close to high pressure pipelines -Possible loading assessment with regard to plant crossing the pipelines and recording such crossing points 	<p>Protective Provisions for the benefit of gas undertakers have been included within the draft DCO [EN010143/APP/3.1] at Part 1 of Schedule 14.</p> <p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1] describes design commitments in relation to gas pipelines such as ensuring that no solar panels are placed over gas pipelines or their easements; and describes that works would be carried out in in line with NGN's guidance document 'Procedures for working close to high pressure</p>	<p>Protective Provisions are contained in the Draft DCO [ES010143/APP/3.1].</p> <p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1].</p> <p>Consultation Report [EN010143/APP/5.1].</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>-Routing of cables and separation distances from the pipelines -Effects of the Solar Farm and associated cables may have on the NGN cathodic protection equipment's and how that will be dealt with</p>	<p>pipelines and associated installations' (Ref. 16-46)</p>	
NATS (formerly National Air Traffic Services)	<p>The proposed development has been examined from a technical safeguarding aspect and does not conflict with our safeguarding criteria.</p>	<p>Noted</p>	<p>Not applicable</p>

Assessment Methodology – Major Accidents or Disasters

Assumptions, Limitations and Uncertainties

- 16.5.17 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:
- Events that could not realistically occur, due to the nature of the Scheme or its location;
 - Events that could realistically occur, but for which the Scheme, and associated receptors, are no more vulnerable than any other development; and
 - Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate.
- 16.5.18 An initial exercise was undertaken and presented in the Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) 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 National Risk Register 2020 (Ref. 16-38). Major accidents or disasters with little relevance in the UK, such as volcanic eruptions, were not included.
- 16.5.19 The long list of major accidents or disasters is presented in Appendix B of the Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**). This initial scoping exercise showed the potential vulnerability of the Scheme to the risk of a major accident and/or disaster associated with a variety of different events. Appendix B of the Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) also provides further clarity on the topics and events which have been scoped into the EIA, and those which have been scoped out, with suitable justification provided.
- 16.5.20 Also, within the Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**), the long list was then screened to identify the third group of major accidents or disasters listed above, 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 16-20** below.
- 16.5.21 It is noted that the National Risk Register 2020 (Ref. 16-38) has been withdrawn and replaced with the National Risk Register 2023 (Ref. 16-39). Unlike previous versions, the National Risk Register 2023 aligns with the structure and content of the UK government's classified internal National Security Risk Assessment (NSRA), which is the government's assessment of the most serious risks facing the UK and reflects changes to the underpinning methodology of the NSRA. The long list and shortlist have been reviewed in light of the National Risk Register 2023 and a new category 'accidental fire or explosion at an onshore major hazard (COMAH) site' has been added to **Table 16-20** as a result.
- 16.5.22 The preliminary assessment of Major Accidents or Disasters presented in the PEI Report considered the potential for fire due to the BESS to impact local residents, habitats and species. However, as BESS has been removed from the Scheme this is no longer applicable and this aspect has

been removed from the discussion presented in the short-list of Major Accidents or Disasters in **Table 16-20**, below.

- 16.5.23 As noted in section 16.3 of this chapter (Glint and Glare), on the basis that there is no evidence that glint and glare for solar farms interferes in any way with aviation navigation or pilot and aircraft visibility or safety, the Planning Inspectorate agreed that this topic could be scoped out of further assessment. However, for completeness this was added to the shortlist and the **Glint and Glare Assessment** presented within this ES (**Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]**) includes assessment of the potential impacts to aviation.
- 16.5.24 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 them 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.
- 16.5.25 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, 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. 16-40);
 - b. The Management of Health and Safety at Work Regulations 1999 (Ref. 16-41);
 - c. The Workplace (Health, Safety and Welfare) Regulations 1992 (Ref. 16-42); and
 - d. Construction (Design and Management) (CDM) 2015 Regulations (Ref. 16-43).

Table 16-20. Major accidents or disasters shortlisted for further consideration

Major Accident or Disaster	Potential Receptor	Comments
Floods	Property and people in areas of increased flood risk.	<p>Both the vulnerability of the Scheme to flooding, and the potential for the Scheme to exacerbate flooding elsewhere, are discussed in the FRA presented as Appendix 9-3, ES Volume 2 [EN010143/APP/6.2]. The findings of the FRA are summarised in Chapter 9: Flood Risk, Drainage and Water Environment, ES Volume 1 [EN010143/APP/6.2].</p> <p>Chapter 9: Flood Risk, Drainage and Water Environment, assesses the impact of flooding and flood risk from all sources (to the Scheme to other developments outside of the Site) to be not significant.</p>
Fire	Local residents, habitats and species	Health and Safety on site would be managed by the applicant to mitigate the risk of fire, in line with legislative safety requirements.
Road accidents	Aquatic environment. Road users	<p>An assessment of accidents and safety is presented in the Transport Assessment, Appendix 13.3, ES Volume 2 [EN010143/APP/6.2] accompanying the Transport and Access chapter of this ES (Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1]). As set out in Chapter 13 the Planning Inspectorate has agreed that the transportation of hazardous loads during construction can be scoped out of EIA assessment, as the characteristics of the Scheme combined with there being no nearby road features which suggest that the transfer of materials poses a greater risk than would be normally expected on the general highway network. However, the Transport Assessment explains the measures employed to ensure safe vehicular transport of components to and from the Site. An assessment of water quality impacts to surface water features during construction, operation and decommissioning (e.g. from runoff containing fine sediments, accidental spillages, trenchless crossings, etc) is presented within Chapter 9: Flood Risk, Drainage and Water Environment, ES Volume 1 [EN010143/APP/6.1] which concluded that the Scheme would result in no significant effects. Measures proposed to reduce pollutant runoff to nearby watercourses, during construction, operation and decommissioning are presented in the relevant Framework Environmental</p>

Major Accident or Disaster	Potential Receptor	Comments
		<p>Management Plans – Framework CEMP [EN/010143/APP/7.7], Framework OEMP [EN010143/APP/7.8] and Framework DEMP [EN010143/APP/7.9] and the application of these measures is secured through the requirements if the DCO. For the Grid Connection Substations, such measures are also set out in the Framework Surface Water Drainage Strategy (Appendix 9-4, ES Volume 2 [EN010143/APP/6.2]).</p> <p>The Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]), as summarised in section 16.3 of this chapter, concludes that there would be no glint and glare impacts to road users.</p>
Rail accidents	Rail users	<p>The Site is located adjacent to the Hull to Selby railway line (the rail line forming the boundary between Solar PV Areas 3b and 3c and passing to the south of Solar PV area 2g). The Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]), as summarised in section 16.3 of this chapter, concludes that there are no Glint and Glare effects on rail users/the rail network.</p> <p>The Grid Connection and Interconnecting Cables need to be routed beneath the railway (between Solar PV Areas 3b and 3c). This will be undertaken using HDD. The detailed design for the HDD will be informed by geotechnical site investigation and assessment (to be undertaken post-consent)</p> <p>Protective Provisions for the for the protection of railway interests (Network Rail) have been included within the draft DCO [EN010143/APP/3.1] at Part 6 of Schedule 14. This includes that the methodology for the HDD works will be agreed with Network Rail.</p> <p>It is therefore considered that there would be no impact to the integrity of rail infrastructure or the safety of rail users as a result of these works.</p>

Major Accident or Disaster	Potential Receptor	Comments
Aircraft disasters	Pilots and aircraft	<p>The Planning Inspectorate agreed to scope out potential impacts of Glint and Glare on aviation, on the basis that there is no evidence that glint and glare for solar farms interferes in any way with aviation navigation or pilot and aircraft visibility or safety. However, for completeness the potential for glint and glare to affect aviation receptors has been assessed within the Glint and Glare Assessment (Appendix 16-2, ES Volume 2 [EN010143/APP/6.2]), as summarised in section 16.3 of this chapter. Four runway approach paths and one ATCT were assessed in detail at Brighton Airfield and Leeds East Airport. Only Green Glare impacts were predicted for Runway 28 at Brighton Airfield, which is an acceptable impact upon runways according to FAA guidance. No glare impacts were identified at other aviation receptors, Overall aviation impacts are Low and Not Significant.</p>
Flood Defence Failure	Property and people in areas of increased flood risk	<p>The only above ground infrastructure placed in areas of highest risk of fluvial flooding (Flood Zone 3) will be Solar PV Panels in small areas of Solar PV Areas 1e and 2a.</p> <p>Both the vulnerability of the Scheme to flooding, and the potential for the Scheme to exacerbate flooding, is discussed in the FRA, Appendix 9-3, ES Volume 2 [EN010143/APP/6.2]. It is noted that the hydraulic modelling undertaken for the Scheme (as presented in the FRA) does not include representation of the River Derwent flood defences. As a consequence, specific breach modelling of the defences was not required as the hydraulic modelling undertaken to inform the assessment represents the undefended and worst case scenario of flood risk to the Scheme.</p> <p>The assessment of effects presented in Chapter 9: Flood Risk, Drainage and Water Environment, ES Volume 1 [EN010143/APP/6.1] which concludes the impact of flooding and flood risk from all sources (to the Scheme and to other developments outside of the Site) to be not significant.</p> <p>The Applicant has requested details of the nature of the flood defences from the Environment Agency (see section 9-4 of Chapter 9: Flood Risk, Drainage and</p>

Major Accident or Disaster	Potential Receptor	Comments
Utilities failure (gas, electricity, water, sewage, oil, communications)	Employees and local residents	<p>Water Environment, ES Volume 1 [EN010143/APP/6.1] and the Consultation Report [EN010143/APP/5.1]).</p> <p>It is known that there are overhead electricity lines, buried cables and gas infrastructure within the Order limits. The Scheme therefore has the potential to affect existing utility infrastructure above and below ground. Impacts to or failure of this infrastructure could potentially lead to a major accident.</p> <p>To identify any existing infrastructure constraints, both consultation and a desk based study will be undertaken prior to construction so that appropriate mitigation such as buffers and easements can be incorporated into the detailed design. This ensures that this infrastructure can be accessed for maintenance and repair reducing the risk of accidents occurring.</p> <p>The Protective Provisions set out in the Draft DCO [EN010143/APP/3.1] and as agreed with the asset owners contain provisions to ensure the safety and security of assets during construction, operation and decommissioning of the Scheme.</p> <p>The indicative design presented in Figure 2-3, ES Volume 3 [EN010143/APP/6.3] shows indicative undeveloped areas within the Solar PV Site (as the property/access rights to which are secured via easements above Northern Gas Networks high pressure gas pipelines and beneath National Grid's overhead electricity cables).</p> <p>As shown in Figure 3-6, ES Volume 3 [EN010143/APP/6.3] and discussed in Chapter 3: Alternatives and Design Evolution, ES Volume 1 [EN010143/APP/6.1] since PEI Reporting stage Solar PV Areas 3c and 2g have been reduced in size and no longer contain National Grid's existing high pressure gas transmission pipeline or the proposed electricity transmission cabling for the Scotland England Green Link 2 Project.</p>
Accidental fire or explosion at an onshore major hazard site	Employees	<p>As stated in Table 16-18 and Table 16-19 the Planning Inspectorate and the HSE have identified that the Scheme extends across the consultation zones of two MAH sites (Spaldington Airfield and DRAX Power) and three MAH pipelines.</p>

Major Accident or Disaster	Potential Receptor	Comments
Past mining and extractive industry	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 will be considered as part of the geotechnical design, at detailed design ensuring that the risk is designed out.</p> <p>As stated in the Phase 1 PRA, Appendix 16-3, ES Volume 2 [EN010143/APP/6.2] the northern extent of Solar PV Area 2a and most of the Grid Connection Corridor (from Wressle to New Road by Drax) are located within a Coal Mining Reporting Area and, as recommended in the Phase 1 PRA, a coal mining report will be obtained for these areas to inform the detailed design as secured through the Framework CEMP [EN010143/APP/7.7].</p>
Plant disease	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. For example, many plant pathogens including Phytophthora species (which cause the decay of living plant material) need water to infect and their spread is limited by low temperatures. The predicted wetter warmer winters could therefore increase their prevalence.</p> <p>The planting design has taken account of biosecurity risks through introducing a wider mix of species and the omission of any species for which there is a known increased risk of disease or pathogen – for example the use of Ash (<i>Fraxinus excelsior</i>) has been avoided due to the current outbreak of the fungal pathogen Ash Dieback (<i>Hymenoscyphus fraxineus</i>). Additionally, Oak (<i>Quercus robur</i>) is the most common hedgerow or standard tree within the Order limits, and is included within the Scheme's planting plan, however the Scheme has introduced a wider range of tree species as a precaution against the northward spread of Oak Processionary Moth (<i>Thaumetopoea processionea</i>), although it is noted that the species is currently only known to be established in a relatively small geographical area of the country across London and surrounding areas. Further information on proposed planting is presented in Chapter 10: Landscape and Visual Amenity [EN010143/APP/6.1] and in the Framework LEMP [EN010143/APP/7.14].</p>

Major Accident or Disaster	Potential Receptor	Comments
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There is the potential for disease and pathogen transfer (including undesirable weed species) between different areas of agricultural land. The loss of soil resource is considered as the main cause of disease and pathogen transfer, due to the transfer of soil (and incorporated seed/spore bank) from infected to uninfected areas. The **Framework Soil Management Plan (SMP) [EN0100143/APP/7.10]** sets out appropriate measures to minimise soil loss and hence biosecurity risk, delivery of the detailed SMP prior to construction will be secured through the DCO.

A Biosecurity Plan will also be prepared prior to construction, secured through the CEMP. This may include measures such as appropriate cleaning and/or disinfection of machinery and equipment in areas considered to be at high risk.

The UK Government's website advertising current occurrences and imposed restrictions with regards to animal and plant diseases will be checked both pre-construction and at regular intervals throughout construction as detailed in the **Framework CEMP [EN010143/APP/7.7]**.

- 16.5.26 Those major accidents and disasters listed in **Table 16-20** that are not being considered within another technical assessment have been reviewed by the design team to ensure risks are addressed through the design as necessary. These events are assessed below.
- 16.5.27 An additional risk has been considered following the above consultation in response to the Planning Inspectorate's comments on another solar project currently going through Examination, which is the risk of HDD failure resulting in drilling fluid breakout and the drill bit becoming stuck.
- 16.5.28 Where there is potential for interaction between a major accident and disaster, receptor, and the Scheme, these have been shortlisted 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. 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 – Major Accidents or Disasters

- 16.5.29 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:
- a. Residential receptors (towns, villages);
 - b. Commercial sites and buildings;
 - c. Roads;
 - d. Railways;
 - e. Designated ecological sites, woodland, farmland, and waterbodies; and
 - f. Underground infrastructure services including electricity, water, communications, and gas.

- 16.5.30 Details of specific receptors that fall into the above categories are provided in **Chapter 2: The Scheme [EN010143/APP/6.1]** of this ES. 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 – Major Accidents or Disasters

Construction and Decommissioning

- 16.5.31 Risks of major accidents and disasters occurring during construction and decommissioning are assessed in the relevant chapters outlined in **Table 16-20**. All works will be subject to risk assessments as required by the **Framework CEMP [EN010143/APP/7.7]** and the **Framework DEMP [EN010143/APP/7.9]**. Mitigation measures to be implemented during construction and decommissioning are listed within the Framework CEMP and DEMP respectively, which will be secured by requirements in the DCO.

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

16.5.32 Electrical cables are required to connect generating components with electricity management infrastructure within the Solar PV Areas before connecting to the Grid Connection Substations in Solar PV Area 1c. These works are subject to a risk assessment as set out in the **Framework CEMP [EN010143/APP/7.7]**.

Accidental fire or explosion at an onshore major hazard site

16.5.33 In their statutory consultation response (**Table 16-19**), the HSE identified that the Scheme extends across the consultation zones of two MAH sites and three MAH pipelines:

- a. ITS Inglis Transport Services Ltd, Spaldington Airfield Spaldington Airfield (Grid Connection Corridor and Solar PV Areas 2b, 2c and 2d);
- b. DRAX Power (Grid Connection Corridor);
- c. National Grid Gas PLC, 7 Feeder: Cawood/ Eastoft pipeline (Grid Connection Corridor);
- d. National Grid Gas PLC, 29 Feeder: Ganstead to Asselby pipeline (Grid Connection Corridor); and
- e. NGN Asselby to Harswell pipeline.

16.5.34 It is noted that National Grid Gas PLC's 29 Feeder: Ganstead to Asselby pipeline (Grid Connection Corridor) was within the boundary of the Solar PV Site at PEI Report stage, and crossed Solar PV Areas 2g and 3c, however changes to the Order limits (as described in **Chapter 3: Alternatives and Design Evolution, ES Volume 1 [EN010143/APP/6.1]** and **Figure 3-6, ES Volume 3 [EN010143/APP/6.3]** have resulted in this pipeline no longer lying inside the Order limits.

16.5.35 The HSE did not refer to the acceptability of the Scheme at the construction or decommissioning phases in its statutory consultation response (**Table 16-19**). However, an assessment is provided below. During construction and decommissioning the Scheme would temporarily introduce construction workers into the consultation zones of the MAH sites/ pipelines listed above. Consultation zones around MAH sites and pipelines are defined by the HSE after assessing the risks and likely effects of major accidents. Employees of the Scheme are considered to be 'normal working population' who are fit and healthy and could be easily organised for emergency action. No members of the public will be present within the working areas. Core working hours will be as per **Chapter 2: The Scheme** of this ES:

- a. Monday to Friday 07.00 to 19.00 (daylight hours permitting);
- b. Saturday 07.00 to 13.00 (daylight hours permitting); and
- c. No Sunday or Bank Holiday working unless crucial to construction (e.g., HDD which must be a continuous activity etc.) or in an emergency.

16.5.36 Emergency working may extend beyond the times quoted above. Working hours may be shortened if working would necessitate artificial lighting and therefore the working day will be shorter in the months with reduced daylight hours.

- 16.5.37 As an exceptional activity HDD may require 24-hour working, particularly to cross the railway to limit disruption to rail services and the relevant Local Planning Authority will be notified in advance of any proposed 24 hour working or working otherwise proposed outside of the core working hours identified above.
- 16.5.38 Additionally, quiet non-intrusive works such as the installation of Solar PV Panels may take place over longer periods during the high summer and other quiet non-intrusive works such as electrical testing, commissioning and inspection may take place over longer periods throughout the year.
- 16.5.39 There will be no staff who will be 'resident' (sleeping on site overnight). The Scheme is therefore considered to represent lowest level of sensitivity and consequently the risk to the workforce due to the proximity of these sites is considered to be **not significant**.

Fire

- 16.5.40 Health and Safety on site would be managed by the applicant during construction and decommissioning to mitigate the risk of fire, in line with legislative safety requirements. **The Framework CEMP [EN010143/APP/7.7]** and **Framework DEMP [EN010143/APP/7.9]** 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. Therefore, no significant effects on the environment due to fire are predicted to occur.

Plant disease

- 16.5.41 The planting strategy for the Scheme has been developed to use native species as described in the **Framework LEMP [EN010143/APP/7.14]**. The species mix has also been chosen to avoid the use of species for which there is a known increased risk of disease or pathogen and to introduce greater variety (and resilience) into the planting. Therefore, no significant effects on the environment due plant disease are predicted to occur.

Criminal damage

- 16.5.42 The Site would be managed by the contractor during construction and decommissioning to mitigate the risk of criminal activity. The design will include safety measures to protect the Site from criminal damage, including fencing, CCTV cameras and an out-of-hours security detail. Therefore, no significant effects on the environment due to the risk of a major accident occurring as a result of criminal damage during construction and decommissioning of the Scheme are predicted to occur.

HDD Failure (construction only)

- 16.5.43 A thorough HDD design will be implemented prior to construction. Pre-construction geotechnical site investigations will be carried out to design a methodology for the HDD including suitable depth for installation the cable (noting that the minimum distances below beds of watercourses: 1.5 m below watercourse bed except the River Ouse and River Derwent where a installation would be a minimum of 5 m below the bed – **Outline Design Principles Statement [EN01014/APP/7.4]** and **Framework CEMP [EN01014/APP/7.7]**). The results of the geotechnical site investigations

also allow the correct tooling and drilling additives to be determined to maintain a stable bore. The pressure within the drilling hole will be monitored during HDD operations and the use of bentonite will reduce the risk of the bore hole collapsing as the drill is removed. Therefore, no significant effects on the environment due HDD failure are predicted to occur.

Operation

- 16.5.44 A **Framework OEMP [EN010143/APP/7.8]** has been prepared to manage environmental risks during operation. The approval and implementation of the Framework OEMP will be secured by a requirement to the DCO.

Criminal damage

- 16.5.45 The operational solar farm would be managed by the Applicant to mitigate the risk of criminal activity. As set out in **Chapter 2: The Scheme** of this ES, the design includes safety measures to protect the site from criminal damage, including fencing, CCTV cameras and lighting. Therefore, no significant effects on the environment due to the risk of a major accident occurring as a result of criminal damage during the operation of the Scheme are predicted to occur.

Accidental fire or explosion at an onshore major hazard site

- 16.5.46 There would be three full time staff during the operational phase. These workers would be primarily based at the site offices at Johnson's Farm which is not within the consultation zone of any MAH site or pipeline. Other workers would be present on site on an 'as and when required' basis as described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**.
- 16.1.1 In their statutory consultation response (**Table 16-19**), the HSE confirmed that owing to the low number of site staff and visitors at the operational phase, they 'would not advise against' the development of the Scheme. Given that the HSE have determined the Scheme to be acceptable, the risk to site staff and visitors due to accidental fire or explosion at an onshore major hazard site is considered to be not significant.

Mitigation Measures – Major Accidents or Disasters

- 16.5.47 Minimising the risk of major accidents during construction, operation and decommissioning will be addressed through appropriate risk assessments as required in the **Framework CEMP [EN010143/APP/7.7]**, **OEMP [EN010143/APP/7.8]** and **DEMP [EN010143/APP/7.9]**. The implementation of those plans will be secured via a requirement to the DCO.

Residual effects – Major Accidents or Disasters

- 16.5.48 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 possibility 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. 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 – Major Accidents or Disasters

- 16.5.49 This section presents an assessment of cumulative effects between the Scheme and other proposed and committed plans and projects including other developments.
- 16.5.50 This assessment has been made with reference to the methodology and guidance set out in **Chapter 5: EIA Methodology, ES Volume 1 [EN010143/APP/6.1]** and shortlist of cumulative schemes identified in **Appendix 17-1, ES Volume 2 [EN010143/APP/6.2]**.
- 16.5.51 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, ES Volume 1 [EN010143/APP/6.1]**.
- 16.5.52 With embedded mitigation and additional mitigation listed above to reduce the risk of fire and other shortlisted events included in **Table 16-20**, 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.

16.6 Telecommunications, Television Reception, and Utilities

Introduction – Telecommunications, Television Reception, and Utilities

- 16.6.1 This section evaluates the effects of the Scheme on Telecommunications, Television Reception, and Utilities. For a description of the Scheme, refer to **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**.

Legislation, Policy and Guidance – Telecommunications, Television Reception, and Utilities

- 16.6.2 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. 16-36). However, given the nature of solar farm developments, they have the potential to affect existing utility infrastructure above and below ground.
- 16.6.3 There is no other legislation, policy or guidance specifically related to Telecommunications, Television Reception, and Utilities.

Consultation

- 16.6.4 A scoping exercise was undertaken in summer/autumn 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.6.5 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, good practice, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on telecommunication, infrastructure, television reception and existing utilities.
- 16.6.6 Following receipt of the Scoping Opinion on 20 October 2022 (**Appendix 1-2, ES Volume 2 [EN010143/APP/6.2]**) the requirements summarised in **Table 16-21** have been identified by consultees in relation to telecommunication, infrastructure, television reception and existing utilities. **Table 16-21** outlines how and where these issues have been addressed within the PEI Report or will be addressed within the ES to ensure they are taken account of as part of the ongoing assessment of telecommunication, infrastructure, television reception and existing utilities.
- 16.6.7 Further consultation in response to formal pre-application engagement was undertaken through the Preliminary Environmental Information Report (PEI Report), issued in May 2023. Responses to this statutory consultation are presented in the **Consultation Report [EN010143/APP/5.1]**. **Table 16-22** outlines the statutory consultation responses relating to Telecommunications, Television Reception, and Utilities and how these have been addressed through the ES.

Table 16-21. Scoping opinion responses (Telecommunications, Television Reception, and Utilities)

Consultee	Summary of comment	How and where addressed	Location of the Response
Planning Inspectorate	The Inspectorate is content that a standalone ES chapter for this aspect is not required; however, the ES should explain the findings of the desk-based study and any required mitigation measures in the Other Environmental Topics chapter.	Telecommunications, Television Reception, and Utilities are discussed in section 16.6 (this section) of Chapter 16, ES Volume 1 [EN010143/APP/6.1]	Section 16.6 provides the assessment for Telecommunications, Television Reception and Utilities.
Planning Inspectorate	The Scoping Report states two alternatives are under consideration for electricity export connection to the National Grid, one of which is Overhead Lines (OHL), and that flexibility may be retained within the DCO submission. The Applicant should seek to minimise optionality in the application, which could lead to extended discussion if accepted for examination. In the event that flexibility is sought, the ES should include an assessment of impacts arising from the installation and operation of OHL on telecommunications, television reception and utilities, where significant effects are likely to occur, or otherwise explain why significant effects are not likely.	As set out in Chapter 2: The Scheme ES Volume 1, [EN010143/APP/6.1] it has been confirmed that there will be no overhead electricity cables used or constructed as part of the Scheme.	Chapter 2: The Scheme ES Volume 1, [EN010143/APP/6.1] confirms that there will be no overhead electricity cables used or constructed as part of the Scheme. The ES therefore does not include and assessment of impacts arising from the installation and operation of overhead electricity cables on telecommunications, television reception and utilities.
Planning Inspectorate	With regard to utilities infrastructure, the Applicant's attention is drawn to the HSE's comments noting the presence of several MAH pipelines within the scoping study area.	See section 16.5: Major Accidents or Disasters of this ES chapter	Section 16.5 of this ES chapter discusses Major Accidents or Disasters.

Table 16-22. Statutory consultation responses (Telecommunications, Television Reception, and Utilities)

Consultee	Summary of comment	How matter has been addressed	Location of response
National Grid Electricity Transmission	National Grid Electricity Transmission’s (NGET) 4VC 400kV high voltage overhead electricity transmission line lies within the Site Boundary.	<p>The overhead transmission lines within the Order limits are shown on Figure 2-3, which illustrates that no solar panels are to be placed beneath the overhead lines and that required easements are observed in the design.</p> <p>Protective Provisions for the protection of National Grid Electricity Transmission Plc as electricity undertaker have been included within the draft DCO [EN010143/APP/3.1] at Part 7 of Schedule 14. Works will be undertaken in consideration of National Grid’s technical guidance note 287 on working near NGET electricity transmission equipment (Ref. 16-44).</p>	<p>Figure 2-3, ES Volume 3 [EN010143/APP/6.3]</p> <p>Protective Provisions are set out in the Draft DCO [EN010143/APP/3.1]</p> <p>Framework CEMP, OEMP and DEMP [EN010143/APP/7.7], [EN010143/APP/7.8], and [EN010143/APP/7.9]</p>
National Grid Electricity Transmission	NGETs Scotland to England Green Link 2 (SEGL2) infrastructure project lies within the Site Boundary. NGET agrees with your recognition that SEGL2 is a planning constraint for your	<p>The routing of SEGL2 in relation to the Scheme is shown on Figure 2-3.</p> <p>As discussed in Chapter 3: Alternatives and Design</p>	<p>Figure 2-3, ES Volume 3 [EN010143/APP/6.3].</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>project, and it is important that your project does not conflict with SEGL2 or jeopardise the delivery or safe operation of SEGL2. NGET agrees with the design principles set out in the PEI Report in that the proposed layout should include the protection of existing and proposed utility assets. There should be a buffer for the SEGL2 project in which no solar development would exist and that an easement for construction and maintenance of SEGL2 is provided.</p>	<p>Evolution, the Order limits have been revised to omit the SEGL2 planning boundary from the Solar PV Site. SEGL2 therefore now only interacts with the Order limits on the Grid Connection Corridor.</p>	<p>Chapter 3: Alternatives and Design Evolution, ES Volume 1 [EN010143/APP/6.1].</p>
<p>National Grid Electricity Transmission</p>	<p>NGET recommend further engagement with the SEGL2 project team in respect of the Grid Connection route on the basis that this interacts with the location of the SEGL2 converter station where it is routed along New Road. Figure 3.8 of Chapter 3 of the SEGL2 ES sets out the proposed permanent and temporary works in this location.</p>	<p>This is noted. The Applicant continues active engagement with SEGL2 project team. The Consultation Report details the ongoing correspondence with NGET regarding SEGL2.</p>	<p>Consultation Report [EN010143/APP/5.1].</p>
<p>National Grid Electricity Transmission</p>	<p>NGET will require its ordinary protective provisions to apply in respect of the SEGL2 project.</p>	<p>Protective Provisions for the protection of National Grid Electricity Transmission Plc as</p>	<p>Protective Provisions are set out in the Draft DCO [EN010143/APP/3.1]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
		<p>electricity undertaker have been included within the draft DCO [EN010143/APP/3.1] at Part 7 of Schedule 14.</p>	
ESP Utilities Group Ltd	<p>ESP Utilities Group Ltd has no gas or electricity apparatus in the vicinity of this site address and will not be affected by your proposed works.</p>	Noted	Not applicable
Equans Digital & Energy Services Ltd	<p>We can confirm that, based on the details provided to us, we have no buried plant or equipment in the identified area.</p>	Noted	Not applicable
Northern Powergrid	<p>Following Company standard procedure, Northern Powergrid formally object to the Order until such time as a written undertaking or agree protective provisions are agreed. Northern Powergrid would encourage the Applicant to enter into dialogue as soon as possible.</p>	<p>This is noted. The Applicant has consulted with Northern Powergrid regarding the provision of Protective Provisions (Consultation Report [EN010143/APP/5.1]) Protective Provisions are provided for the benefit of electricity undertakers in Part 1 of Schedule 14 of the Draft DCO [EN010143/APP/3.1].</p>	<p>Protective Provisions are set out in the Draft DCO [EN010143/APP/3.1] Consultation Report [EN010143/APP/5.1]</p>
Southern Gas Networks Plc	<p>Southern Gas Networks Plc confirm they are not affected by this scheme.</p>	Noted	Not applicable

Consultee	Summary of comment	How matter has been addressed	Location of response
Vodafone	Please accept this email as confirmation that Vodafone: Fixed does not have apparatus within the boundary of your proposed works.	Noted	Not applicable
Yorkshire Water Services Limited	Due to the proposal locating considerably outside of the Yorkshire Water groundwater asset Source Protection Zones it is of no risk to groundwater supply. In general, the proposal should be low risk as the foundations for the solar panels will not be expected at great depth.	Noted	Not applicable
Yorkshire Water Services Limited	The electrical wiring is unlikely to be oil filled and therefore no risk of leaching into the ground.	Details of cable design are presented in Chapter 2: The Scheme . It is confirmed that the cables used in the scheme will not be oil filled	Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1].
Yorkshire Water Services Limited	Weed management is the main concern as if herbicide or similar spray is used it could leach into the ground.	The Framework CEMP, OEMP and DEMP contain measures for the appropriate storage and management of chemicals. Should herbicide or other spray be used, a method statement, operating procedure or similar will be prepared prior to the work	Framework CEMP, OEMP and DEMP [EN010143/APP/7.7], [EN010143/APP/7.8], and [EN010143/APP/7.9]

Consultee	Summary of comment	How matter has been addressed	Location of response
Yorkshire Water Services Limited	<p>The Grid Connection Cable that stretches from Long Drax in the south-west lies in Source Protection Zone 3 for the Selby ground water sources. Are there any details on the depths and materials this is made of? Or has the cable already been laid.</p>	<p>commencing, this will include measures to protect ground and surface water, including that such work would not be undertaken during or before rainfall and high winds. Such work will only be carried out by suitably competent personnel. using products approved for UK use with adherence to manufacturer’s instructions. This mitigation is secured through the Framework CEMP, OEMP and DEMP</p> <p>The cables would only be installed should the DCO be granted. Cable construction is predicted to commence in 2025 and would take approximately 12 months (Chapter 2 of this ES).</p> <p>Chapter 2 of this ES describes the likely specifications of the Grid Connection Cable and the anticipated installation depths.</p>	<p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1].</p>
Yorkshire Water Services Limited	<p>On the Statutory Sewer Map there are no public sewers recorded to cross the proposal site. It is noted</p>	<p>Noted. Protective Provisions are provided for the benefit of water and sewerage undertakers in</p>	<p>Draft DCO [EN010143/APP/3.1].</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	that the accuracy of the Statutory Sewer Map cannot be guaranteed. Any damage to Yorkshire Water Services Limited's apparatus and the costs incurred will be the responsibility of the Applicant.	Part 1 of Schedule 14 of the Draft DCO [EN010143/APP/3.1] . Further negotiations regarding the Protective Provisions will be undertaken should consent be granted.	
Yorkshire Water Services Limited	Prior to commencing major works the exact location of apparatus (if any) must be determined.	This is noted and provisions are provided in the Framework CEMP and DEMP. Major works affecting utilities are not expected during operation.	Framework CEMP and DEMP [EN010143/APP/7.7] and [EN010143/APP/7.9]
Yorkshire Water Services Limited	There are public sewers not marked on our mapping records. Unmapped sewers may cross the proposal sites.	This is noted and provisions are provided in the Framework CEMP and DEMP. Works affecting utilities are not expected during operation.	Framework CEMP and DEMP [EN010143/APP/7.7] and [EN010143/APP/7.9]

- 16.6.8 It is noted that a private water supply pipe is known to cross Solar PV Area 3b in an approximate east-west direction from Wood Lane to supply the properties adjacent to the centre of that Solar PV Area. The Applicant has liaised with the residents and a new pipe will be installed around the perimeter of the field prior to solar PV Installation works in this Solar PV Area commencing. Disruption to supply will be minimal, a few minutes as the connection is swapped to the new pipe.
- 16.6.9 Further detail on consultation can also be found in **ES Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1]**.

Assessment Methodology – Telecommunications, Television Reception, and Utilities

Assumptions, Limitations and Uncertainties

- 16.6.10 To identify any existing infrastructure constraints, both consultation and desk-based study have been undertaken and are an on-going process. Consultation with relevant telecommunication and utilities providers is a routine part of solar development.
- 16.6.11 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.
- 16.6.12 A desk-based search has been undertaken for the presence of telecommunications, television reception and utilities infrastructure within the Site and within the vicinity. A qualitative approach was used to assess the likelihood of significant effects on telecommunications, television reception and utilities.
- 16.6.13 The assessment of effects on telecommunications, television, and radio is based on the maximum parameters set out in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**. This includes the anticipated 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, Television Reception, and Utilities

Telecommunications

- 16.6.14 There are several mobile phone masts present within or in the vicinity of the Order limits.

Television reception

- 16.6.15 The area surrounding the Scheme receives television signals from the Emley Moor transmitter, located approximately 55 km south-west of the Scheme at the closest point.

Embedded Mitigation – Telecommunications, Television Reception, and Utilities

- 16.6.16 Precautionary measures will be included as part of the embedded mitigation for the Scheme, which will include locating the Scheme outside of utilities protected zones;

the use of ground penetrating radar before excavation to identify any unknown utilities; and consultation and agreement of construction/demobilisation methods prior to works commencing.

- 16.6.17 Additionally, measures in relation to safe working beneath overhead lines will be in place at all stages of the Scheme for example measures set out in National Grid's technical guidance note 287 (Third-party guidance for working near National Grid Electricity Transmission equipment) (Ref. 16-44) such as ensuring adequate clearances are in place when plant and equipment is being moved beneath the overhead lines.
- 16.6.18 Similarly, measures in relation to safe working near buried utilities, particularly gas pipelines, will be in place at all stages of the Scheme. For example mitigation set out in National Grid and Northern Gas Networks guidance documents for third parties working in the vicinity of high pressure gas pipelines and associated installations (Ref. 16-45 and Ref. 16-46).
- 16.6.19 These measures have been further refined within the **Framework CEMP [EN010143/APP/7.7]**, **Framework OEMP [EN010143/APP/7.8]** and **Framework DEMP [EN010143/APP/7.9]** secured through the requirements of the DCO.
- 16.6.20 The **draft DCO [EN010143/APP/3.1]** includes Protective Provisions for the protection of electricity, gas, water and sewerage undertakers (Part 1 of Schedule 14), for the protection of electronic communications code networks (Part 2 of Schedule 14), and for the protection of National Grid Electricity Transmission Plc as electricity undertaker (7 of Schedule 14). Engagement with relevant statutory undertakers in this respect is ongoing.

Assessment of Likely Impacts and Effects

Telecommunications

- 16.6.21 The Scheme is unlikely to interfere with telecommunications infrastructure due to the relatively low height of the panels and infrastructure, which will not provide an obstacle for telecommunication waves, and therefore no effects are anticipated in the construction, operation, and decommissioning phases.

Television Reception

- 16.6.22 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

- 16.6.23 The potential exists for utilities to be affected during the construction and decommissioning of the Scheme through inadvertent damage caused as a result of excavation and engineering operations.
- 16.6.24 The application of embedded mitigation such as those outlined in paragraphs 16.6.16 to 16.6.20 would reduce the likelihood of effects on utilities during construction, for example through ensuring the location of utilities infrastructure is known and accounted for within the detailed design, and that the works are conducted in accordance with good practice guidance. Therefore, no adverse effects are expected during construction.

- 16.6.25 As explained in **Chapter 2: the Scheme, ES Volume 1 [EN010143/APP/6.1]** the mode of cable decommissioning for the Grid Connection and Interconnecting Cables will be dependent upon government policy and best practice at that time. Currently, the most environmentally acceptable option is considered to be leaving the cables in situ, as this avoids disturbance to overlying land and habitats and to neighbouring communities. If cables were to be removed, this would be achieved by opening up the ground at regular intervals and pulling the cable through to the extraction point, avoiding the need to open up the entire length of the cable route. Therefore, the scale of disturbance / impact would be less than at construction. Additionally, the embedded mitigation measures used during construction would also apply during decommissioning. Therefore, no adverse effects are predicted during decommissioning.
- 16.6.26 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, and embedded mitigation measures in relation to safe working beneath overhead lines will be in place. In the unlikely event that maintenance works (for example to repair a cable) require excavation near to below ground utilities infrastructure, appropriate mitigation measures will be in place, as for construction.
- 16.6.27 The assessment presented above is not influenced by the timing of the construction/decommissioning phases of the Scheme or the operational lifespan of the Scheme.

Cumulative Effects

- 16.6.28 The Scheme has been assessed to have no effect on telecommunication, television, or utilities. It is expected that the other 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. It is assumed that all other developments will conform to good practice measures and their environmental impacts will be managed through a CEMP (or similar) and would include mitigation measures to reduce the risk of damaging utilities during construction. Therefore, no cumulative effects are expected on telecommunications, television reception, or utilities.

16.7 Materials and Waste

Introduction – Materials and Waste

- 16.7.1 This section discusses the expected materials and waste streams from the Scheme and how they will be managed.
- 16.7.2 This section is supported by the following appendices in **ES Volume 2 [EN010143/APP/6.2]**:
- Appendix 16-1: Legislation, Policy and Guidance (Other Environmental Topics);** and
 - Appendix 16-4: Framework Site Waste Management Plan.**
- 16.7.3 This section is supported by the following figures in **ES Volume 3 [EN010143/APP/6.3]**:
- Figure 16-2: Authorised and Historic Landfills, Permitted Waste Sites and Waste Site Applications.**
- 16.7.4 This section follows the methodology set out in the Institute of Environmental Management and Assessment (IEMA) guide to: Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach (referred from herein as the 'IEMA Guidance' (Ref. 16-47)).
- 16.7.5 This section discusses the expected waste streams from the Scheme and how they will be managed. Design life, replacement frequency and recycling of key Scheme components are also considered. A qualitative high level preliminary assessment has been undertaken in accordance with the IEMA Guidance.
- 16.7.6 For the purpose of this assessment, materials and waste comprise:
- The consumption of materials (key construction materials only); and
 - The generation and management of waste.
- 16.7.7 Materials are defined in the IEMA Guidance as “*physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel*”.
- 16.7.8 Other material assets considered include built assets such as landfill void capacity and allocated/safeguarded mineral and waste sites.
- 16.7.9 Impacts on Mineral Safeguarding Areas (MSAs) are not assessed in a materials and waste assessment in accordance with the IEMA Guidance. **Chapter 12: Socio-economics and Land Use, ES Volume 1 [EN010143/APP/6.1]** scopes out socio economic impacts to MSAs (as agreed with the Local Mineral Planning Authorities) due to the non-sterilisation of these reserves resulting from the temporary nature of the solar development. The correspondence with the Local Mineral Planning Authorities in this regard is contained in **Appendix 12-2, ES Volume 2 [EN010143/APP/6.2]**.
- 16.7.10 There are no allocated/safeguarded waste and mineral sites, or historic and permitted landfills within the Order limits. Some sites have been identified within 500 m of the Scheme; however, these sites are unlikely to be directly impacted (Brighton Authorised Landfill, New Road Historic Landfill at Drax Power Station and permitted waste sites at Drax Power Station, Brighton Airfield and Spaldington

Airfield). Therefore, impacts on mineral and waste sites are not considered further in the assessment.

- 16.7.11 Waste is defined as per the Waste Framework Directive (Ref. 16-48) as “any substance or object which the holder discards or intends or is required to discard”.
- 16.7.12 The legal definition of waste covers substances or objects which fall outside of the commercial cycle or out of the chain facility. In particular, most items that are sold or taken off-site for recycling are wastes, as they require treatment before they are reused or resold.
- 16.7.13 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.

Legislation, Policy and Guidance – Materials and Waste

- 16.7.14 Legislation, planning policy, and guidance relating to Materials and Waste and pertinent to the Scheme comprises the documents listed below. More detailed information can be found in **Appendix 16-1, ES Volume 2 [EN010143/APP/6.2]:**

Legislative Framework – Materials and Waste

- a. The Waste Framework Directive (Ref. 16-48);
- b. The Waste (England and Wales) Regulations 2011 (Ref. 16-49);
- c. The Environmental Protection Act 1990 (Ref. 16-50);
- d. The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 16-51);
- e. The Hazardous Waste Regulations (England and Wales) 2005 (amended in 2016) (Ref. 16-52); and
- f. The Environment Act 2021 (Ref. 16-3).

National Planning Policy – Materials and Waste

- a. National Planning Policy for Waste (Ref. 16-53);
- b. Overarching National Policy Statement for Energy (EN-1) (Ref. 16-8);
- c. Draft Overarching National Policy Statement for Energy (EN-1) (2023) Ref. 16-9);
- d. National Planning Policy Framework (NPPF) (2023) (Ref. 16-10);
- e. The Waste Management Plan for England (2021) (Ref. 16-54);
- f. A Green Future: Our 25 Year Plan to Improve the Environment 2018 (Ref. 16-55);
- g. Environmental Improvement Plan 2023 (Ref. 16-12);
- h. Our Waste, Our Resources, A Strategy for England 2018 (Ref. 16-56); and
- i. National Planning Policy Guidance (NPPG) for Minerals and Waste (Ref. 16-57).

Local Planning Policy – Materials and Waste

- a. East Riding Local Plan (2016) (Ref. 16-58);

- b. East Riding Local Plan Update (2022) (Ref. 16-59);
- c. East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan (2019) and associated policies map (Ref. 16-60);
- d. Kingston upon Hull and East Riding of Yorkshire and Joint Waste Local Plan (2004) (Ref. 16-61);
- e. Kingston upon Hull and East Riding of Yorkshire and Joint Waste Local Plan update (2004) (Ref. 16-62);
- f. North Yorkshire County Council, City of York Council and North York Moors National Park Authority and Minerals and Waste Joint Plan (2022) and associated policies map (Ref. 16-63).

Guidance – Materials and Waste

- a. IEMA Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (Ref. 16-47);
- b. Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (Ref. 16-64);
- c. Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref. 16-65);
- d. Waste Duty of Care Code of Practice (Ref. 16-66); and
- e. Applying the Waste Hierarchy (Ref. 16-67).

Consultation – Materials and Waste

- 16.7.15 A scoping exercise was undertaken in September 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.7.16 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Materials and Waste.
- 16.7.17 The Scoping Opinion was received on 20 October 2022 (**Appendix 1- 2, ES Volume 2 [EN010143/APP/6.2]**). The feedback received from stakeholders at scoping and Applicant responses in relation to Materials and Waste are presented in **Appendix 1-3, ES Volume 2 [EN010143/APP/6.2]**. This is also summarised in **Table 16-21**. Scoping opinion responses (materials and waste).
- 16.7.18 Further consultation in response to formal pre-application engagement was undertaken through the PEI Report, issued in May 2023. Responses to this statutory consultation are presented in the **Consultation Report [EN010143/APP/5.1]**. **Table 16-24** outlines the statutory consultation responses relating to Materials and Waste and how these have been addressed through the ES.
- 16.7.19 Further detail on consultation can also be found in **ES Chapter 4: Consultation, ES Volume 1 [EN010143/APP/6.1]**.
- 16.7.20 No additional consultation has been undertaken to date in relation to Materials and Waste.

Table 16-23. Scoping opinion responses (materials and waste)

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	The Applicant is referred to the Inspectorate’s comments regarding minerals safeguarding areas (MSA).	<p>Assessment of the impacts of the Scheme on MSAs are scoped out of the EIA as agreed with the relevant Mineral Planning Authorities.</p> <p>The Planning Statement [EN010143/APP/7.2] contains discussion on MSAs and sets out how the Scheme complies with relevant mineral planning policy and will not result in the sterilisation of mineral resources.</p>	<p>Appendix 12.2 ES Volume 2 [EN010143/APP/6.2] contains the correspondence with the Mineral Planning Authorities agreeing that assessment of impacts to MSAs is not required.</p> <p>The Planning Statement [EN010143/APP/7.2] contains discussion on MSAs.</p>
Planning Inspectorate	The Inspectorate agrees that a standalone chapter on materials and waste is not required in the ES and that the description of the materials required and potential streams of construction waste and estimated volumes can be included in the Other Environmental Topics 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	<p>Waste estimates and description for construction and decommissioning are included in this ES section. Framework CEMP and DEMPs accompany the DCO Application. All assumptions are included in this ES section.</p> <p>Mitigation including applying the waste hierarchy is included in this ES section.</p> <p>Transportation of waste is considered in Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1].</p> <p>A Framework SWMP is provided alongside the ES and provides as much detail made available at the time of writing.</p>	<p>Within this chapter, waste estimates are presented in Table 16-26. and Table 16-28.; assumptions are listed in paragraph 16.7.24; and mitigation is discussed in paragraph 16.7.36 to 16.7.46.</p> <p>Framework CEMP, [EN010143/APP/7.7]</p> <p>Framework DEMP, [EN010143/APP/7.9]</p> <p>Chapter 13: Transport and Access, ES Volume 1 [EN010143/APP/6.1].</p> <p>Framework SWMP, Appendix 16-4, ES Volume 2 [EN010143/APP/6.2]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>the ES. In addition, the ES should describe any measures implemented to minimise waste and state whether the waste hierarchy will be utilised. The Framework CEMP and Site Waste Management Plan (SWMP) should include as much detail as possible on on-site waste management, recycling opportunities and off-site disposal.</p>		
Planning Inspectorate	<p>The potential for cumulative effects with other development should also be assessed in the ES, in line with the methodology presented in Section 5.6 of the Scoping Report.</p>	<p>Materials and waste is included in the cumulative effects chapter of the ES.</p>	<p>Chapter 17: Cumulative Effects and Interactions, ES Volume 1 [EN010143/APP/6.1].</p>
Environment Agency	<p>Apply the waste hierarchy as a priority order of prevention, reuse, recycling before considering other recovery or disposal options.</p>	<p>A Framework SWMP covering these aspects is provided alongside the ES.</p>	<p>Appendix 16-2: Framework SWMP ES Volume 2 [EN010143/APP/6.2]</p>
Environment Agency	<p>Consider storage, treatment and disposal of any waste produced. Adherence to the waste hierarchy and adoption of best practice in relation to site waste management planning to deliver against circular economy objectives.</p>	<p>A Framework SWMP covering these aspects is provided alongside the ES.</p>	<p>Appendix 16-2: Framework SWMP ES Volume 2 [EN010143/APP/6.2]</p>
Environment Agency	<p>Adhere to The CL:AIRE Definition of Waste: Development Industry Code of Practice. Ensure that all contaminated materials are adequately characterised both</p>	<p>A Framework SWMP and Framework CEMP covering these aspects are provided.</p>	<p>Appendix 16-2: Framework SWMP ES Volume 2 [EN010143/APP/6.2]</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
	<p>chemically and physically, and that the permitting status of any proposed on-site operations are clear.</p>		<p>Framework CEMP [EN010143/APP/7.7]</p>
<p>Environment Agency</p>	<p>Ensure that all contaminated materials are adequately characterised both chemically and physically in line with standards and guidance and that the permitting status of any proposed treatment or disposal activity is clear.</p> <p>There are no historic or permitted landfill sites within the scheme's boundaries. Should the proposed scheme boundary change to include areas of the landfill, potential impacts and mitigation measures would need consideration. There are no other landfill or deposit for recovery schemes located within the scheme boundaries.</p>	<p>A Framework SWMP covering these aspects is provided alongside the ES.</p> <p>The baseline including location of landfills has been rechecked prior to DCO submission and is shown in Figure 16-2; Authorised and Historic Landfills, Permitted Waste Sites and Waste Site Applications.</p>	<p>Framework SWMP, Appendix 16-4: ES Volume 2 [EN010143/APP/6.2]</p> <p>Figure 16-2, ES Volume 3 [EN010143/APP/6.3].</p>
<p>Environment Agency</p>	<p>Development of a Framework CEMP, Framework SWMP and Framework DEMP are supported. DCO Requirement that will commit the applicant to produce detailed plans which would be agreed with the relevant authorities are supported.</p>	<p>The comment is noted, and it is confirmed that the preparation and implementation of detailed versions of these Framework plans will be a requirement of the DCO.</p>	<p>Not applicable.</p>

Table 16-24. Statutory consultation responses (Materials and Waste)

Consultee	Summary of comment	How matter has been addressed	Location of response
North Yorkshire Council - Minerals and Waste Planning	Planning Services have reviewed the documentation and have no comments to make.	Comment is noted.	Not applicable.
East Riding of Yorkshire Council - Yorkshire Water Public Protection District Team - Waste	The arrangements for the storage and disposal of waste from the staff welfare facilities should be submitted as part of the DCO application.	A Framework SWMP covering these aspects is provided as part of this ES.	Appendix 16-2: Framework SWMP ES Volume 2 [EN010143/APP/6.2]
East Riding of Yorkshire Council	Temporary compounds comprised of parking, storage, staff welfare and waste management facilities will be located within the site together with a single temporary construction compound, on the western side of the River Derwent crossing.	Comment is noted. It is noted however that the design has evolved since Statutory Consultation and there are now five temporary Construction Compound Areas, A – E, three within the Solar PV Site and two on the Grid Connection Corridor (as shown on Figure 2-4). The temporary Construction Compound Area to western side of the River Derwent is Construction Compound Area D.	Figure 2-4, ES Volume 3 [EN010143/APP/6.3]

Assessment Methodology – Materials and Waste

Assumptions, Limitations and Uncertainties

- 16.7.21 The material and waste assessment has been undertaken on the basis of information available at the time of the assessment. Any assumptions made for the assessment and the limitations this presents are reported, including:
- a. The future baseline is assumed to be same as the current baseline as outlined in paragraph 16.7.30;
 - b. Material and waste estimates are based upon other similar Solar Nationally Significant Infrastructure Project (NSIP) schemes;
 - c. The solar panels, mounting structures, inverters, transformers, switchgear and other supporting equipment will be manufactured off-site to specified sizes; and
 - d. The landfill diversion rate for the Scheme will be more than 60%.

Matters Scoped in/Scoped out

- 16.7.22 As described in **Table 16-23**, the Planning Inspectorate has agreed that as significant adverse materials and waste impacts were not expected during either construction, operation or decommissioning, a separate materials and waste chapter was not required, but the impacts are assessed at a high level and are presented within this ES section.

Study Area

- 16.7.23 The Study Areas for materials and waste are defined in line with the IEMA Guidance (Ref. 16-47). Two types of Study Areas are defined:
- a. A Scheme Study Area – for construction and operational waste generation, use of construction and operational materials and consideration of impacts on allocated/safeguarded mineral and waste sites. The Study Area is deemed to include the footprint of the proposed works, together with any temporary land requirements during the construction. For the purpose of this assessment, sites within 500 m of the Scheme have been reviewed. This buffer allows for sites adjacent to the Scheme and sites which do not have a defined boundary to be considered (i.e. waste site applications and permitted waste sites are shown as a point, however their site boundary may extend beyond that point)
 - b. An expansive Study Area – within which waste is managed and materials are sourced:
 - i. Non-hazardous and inert waste management – Yorkshire and the Humber and East Midlands;
 - ii. Hazardous waste management – England;
 - iii. Availability of key construction materials, crushed rock, sand and gravel, ready-mixed concrete and asphalt – Yorkshire and the Humber and East Midlands; and
 - iv. Availability of key construction materials, steel – UK.

Methodology

- 16.7.24 The IEMA Guidance methodology for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials consumption on the national and regional availability (consumption/sales). In a worst case, where material sensitivity is very high, a significant effect would occur at a magnitude of minor, which is where construction materials are more than 1% by volume of the baseline availability.
- 16.7.25 The IEMA Guidance offers two methods to assess waste effects:
- a. W1 – Void Capacity, a detailed methodology where the magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and/or operation. In a worst case, where landfill sensitivity is very high, a significant effect would occur at a magnitude of minor, which for Scheme non-hazardous and inert waste is more than 1% of landfill capacity and for hazardous waste is more than 0.1% of landfill capacity and
 - b. W2 – Landfill Diversion, a simpler approach where developments are compared to a good practice landfill diversion rate of 90%. A significant effect would occur at a magnitude of moderate which is a landfill diversion of less than 60%.

Baseline Conditions – Materials and Waste

- 16.7.26 This section describes the baseline conditions with the Study Areas with specific reference to Materials and Waste.

Data Sources

- 16.7.27 In preparation of this section, the following sources of published information have been used to establish the baseline conditions:
- a. Make UK (Ref. 16-68);
 - b. Minerals Products Association (Ref. 16-69);
 - c. Environment Agency (Ref. 16-70);
 - d. Local Authority Local Plans:
 - i. East Riding Local Plan (2016) (Ref. 16 46);
 - ii. East Riding Local Plan Update (2022) (Ref. 16 47);
 - iii. East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan (2019) and associated policies map (Ref. 16 48);
 - iv. Kingston upon Hull and East Riding of Yorkshire and Joint Waste Local Plan (2004) (Ref. 16 49);
 - v. Kingston upon Hull and East Riding of Yorkshire and Joint Waste Local Plan update (2004) (Ref. 16 50);
 - vi. North Yorkshire County Council, City of York Council and North York Moors National Park Authority and Minerals and Waste Joint Plan (2022) and associated policies map (Ref. 16 51); and
 - e. Waste and Resources Action Programme (WRAP) (Ref. 16-65).

Existing Baseline

16.7.28 Baseline information for Materials and Waste has been reviewed and consists of:

- a. There are no allocated/safeguarded mineral and waste sites, historic or authorised landfill, waste site applications or permitted waste sites within the Scheme Order Limits (as shown on **Figure 16-2; Authorised and Historic Landfills, Permitted Waste Sites and Waste Site Applications, ES Volume 3 [EN010143/APP/6.3].**)
- b. National and regional availability (consumption/sales) for key construction materials:
 - i. UK steel, 17 million tonnes (Ref. 16-68),
 - ii. regional aggregates (9.2 million tonnes crushed rock and 2.1 million tonnes of sand and gravel) (Ref. 16-69);
 - iii. regional asphalt (1.9 million tonnes) (Ref. 16-69); and
 - iv. regional concrete (1.1 million m³, 2.6 million tonnes based on a density of 2.4 tonnes/m³) (Ref. 16-69),
- c. Non-hazardous and inert landfill void capacity in Yorkshire and the Humber (45 million m³ and 25 million m³) (Ref. 16-70);
- d. Hazardous merchant landfill void capacity England (7.9 million m³) (Ref. 16-70);
- e. National non-hazardous construction and demolition waste recovery rate. In 2020, the UK generated 59.1 million tonnes of non-hazardous C&D waste, of which 54.8 million tonnes was recovered. This represents a recovery rate of 92.6% (Ref. 16-71); and
- f. Standard, good and best practice recovery rates by material are provided by WRAP (Ref. 16-72).

16.7.29 Recovery rates for key construction materials and other construction wastes relevant to the Scheme are provided in **Table 16-25**.

Table 16-25. Standard, Good and Best Practice Recovery Rates by Material

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95
Miscellaneous	12	50	75
Electrical equipment	Limited information	70	95

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Cement	Limited information	75	95
Liquids and oils	100	100	100
Hazardous	50	Limited information, cannot be 100% since some hazardous waste e.g. asbestos must be landfilled.	

Future Baseline

- 16.7.30 There is no publicly available information on any potential long-term changes to this national and regional availability (consumption/sales) for key construction materials by the time of construction of the Scheme. Construction material demand such as ready mixed concrete is closely aligned to both the quantity of construction taking place and the general economy, therefore, it is deemed inappropriate to forecast future demand as the demand is unlikely to be linear. It is therefore not possible to set a future baseline for materials. Therefore, based on professional judgement future availability is assumed to be the same as the current baseline.
- 16.7.31 There is no publicly available information on any potential changes to this landfill capacity by the time of the construction of the Scheme. Due to the cyclic nature of inert landfill capacity, it is not realistic to forecast future landfill capacity since this may result in an increase in landfill capacity. Therefore, inert landfill capacity is assumed to remain the same as the current baseline. For non-inert landfill capacity (which includes hazardous waste) using the current rate of decline of landfill capacity and forecasting into the future would lead to the inevitable conclusion that there would be no void space remaining. However, this is not a credible scenario: if there is still a need for landfill, then the waste planning authority will need to consent new landfill capacity to replace that which has been used up. Therefore, based on professional judgement non-hazardous and hazardous landfill capacity is assumed to remain the same as the current baseline.

Embedded Mitigation – Materials and Waste

- 16.7.32 Where practicable, mitigation measures have been incorporated into the Scheme design and/or how it shall be constructed. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as far as is practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation / mitigation by design approach has been taken into account when evaluating the significance of the potential impacts.

Construction

- 16.7.33 The Scheme will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy, illustrated in **Plate 16-1**.

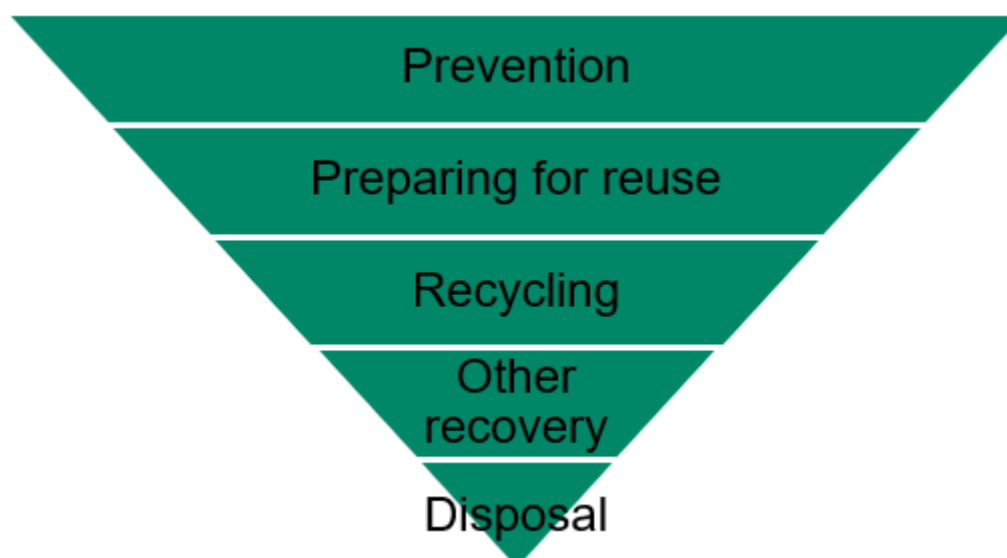


Plate 16-1. The Waste Hierarchy, from Defra's Guidance on Applying the Waste Hierarchy, recreated by AECOM (Ref. 16-71)

16.7.34 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.

16.7.35 The construction of the Scheme will be subject to measures and procedures defined within a CEMP. The CEMP will include the implementation of industry standard practice and control measures for environmental impacts arising during construction, such as the control of dust and the approach to material and waste management on-site. A **Framework CEMP [EN010143/APP/7.7]** and **Framework SWMP, Appendix 16-4, ES Volume 2 [EN010143/APP/6.2]** are included alongside the ES, which set out:

- a. The waste streams that will be generated;
- b. How the waste hierarchy will be applied to these wastes;
- c. Good practice measures for managing waste; and
- d. Roles and responsibilities for waste management.

16.7.36 The construction contractor will use these documents to produce their CEMP and SWMP prior to works commencing on-site.

Operation

16.7.37 During operation, the Scheme will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy, illustrated in Plate 16 1.

16.7.38 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.

16.7.39 These measures are set out in the **Framework OEMP [EN010143/APP/7.8]** secured through the DCO.

Decommissioning

- 16.7.40 During decommissioning, the Scheme will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy, illustrated in **Plate 16-1**.
- 16.7.41 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.
- 16.7.42 The decommissioning of the Scheme will be subject to measures and procedures defined within a DEMP as secured through the DCO; a Framework DEMP [EN010143/APP/7.9] is included alongside the DCO Application.

Assessment of Likely Impacts and Effects – Materials and Waste

- 16.7.43 The Scheme has the potential to affect materials and waste (negatively), during construction, operation and during decommissioning, in the following ways:
- a. Changes in demand for construction materials; and
 - b. Changes in available landfill void capacity.
- 16.7.44 The assessments have been undertaken following consideration of the embedded mitigation measures as described in Paragraphs 16.7.32 to 16.7.42.

Construction Effects

Materials

- 16.7.45 Material estimates are about 3,380 tonnes of concrete, 7,380 tonnes of aggregates and 18,080 tonnes of steel to construct the Scheme. This information is based upon other similar Solar NSIP schemes.
- 16.7.46 Construction materials required to construct the Scheme are unlikely to be required in large quantities e.g., more than 1% of regional or national construction material availability (1% of national steel availability is 170,000 tonnes, 1% of regional availability of aggregates and concrete are 113,000 tonnes and 26,400 tonnes respectively). Therefore, no significant effects are anticipated.

Waste

- 16.7.47 The type of waste generated during construction is likely to comprise:
- a. General waste from site offices and welfare facilities;
 - b. Small quantities of waste from the maintenance of construction vehicles;
 - c. Waste from the potential demolition of buildings at Johnson's Farm;

- d. Packaging waste from incoming materials e.g. paperboard, wood and plastic); and
- e. Other waste from construction of fencing, internal tracks, substations and field stations, construction compounds and other supporting infrastructure.

16.7.48 The solar PV panels, mounting structures, inverters, transformers, switchgear and other supporting equipment will be manufactured off-site to the specified sizes, and therefore wastage during installation is expected to be minimal.

16.7.49 **Table 16-26.** summarises the anticipated waste streams from construction. This information is based upon other similar Solar NSIP schemes and wastage from construction materials.

Table 16-26. Estimated Construction Waste

Waste Type	Estimated Waste Quantity (tonnes)	Estimated Waste Quantity (m³)	Recyclable/Recoverable
General waste from site offices and welfare facilities	Minimal	Minimal	Yes
Waste from the maintenance of construction vehicles	Minimal	Minimal	Yes
Hazardous waste (e.g. chemicals, batteries, solvents, oils, aerosols etc.)	Minimal	Minimal	Yes
Waste from the potential demolition of buildings at Johnson's Farm.	Minimal	Minimal	Yes
Paperboard (packaging)	4,430	21,094	Yes
Wood (pallets, cable drums)	5,344	28,125	Yes
Plastic (packaging)	394	2,813	Yes
Construction material wastage (assumed a 5% wastage rate for non-assembled components including concrete, aggregates, aluminium and plastic from cables)	752	362	Yes
Total construction waste	10,919	52,394	

- 16.7.50 With the embedded mitigation measures in place, the overall quantities of construction waste are anticipated to be below 1% of regional inert (250,000 m³) and non-hazardous (460,000 m³) landfill capacity and less than 0.1% of national hazardous (12,500 m³) landfill capacity. Therefore, the magnitude of impact is negligible, and the effect is slight, which is considered to be not significant.
- 16.7.51 As set out in **Table 16-25**, good and best practice waste recovery (landfill diversion) for the Scheme is likely to be above 90% for the majority of construction wastes. Therefore, the magnitude of impact is negligible, and the effect is slight, which is considered to be not significant.
- 16.1.2 Excavated material is not included in the construction waste estimates or when calculating the overall waste recovery rate, since where practicable the material would be reused on-site and hence will not be categorised as a waste. Waste recovery targets do not include excavated material (uncontaminated excavated soil and stones, EWC code 17 05 04). This approach is consistent with the waste hierarchy and the objectives of minimising waste generation and reusing materials.
- 16.7.52 As the Solar PV Site is relatively flat, large-scale earthworks are not expected to be required and therefore there is not expected to be either a large surplus or shortfall of fill material requiring either export or import from the Solar PV Site. It is expected that all materials removed by cable trenching operations or in the creation of working or laydown/compound areas will be reinstated again with no import or export of materials being required. At this stage the potential for generation of some surplus excavated material cannot be ruled out, but the quantities involved would be not significant in the context of regional landfill capacity, and would only be disposed of to landfill as a last resort, with reuse or deposit for recovery being preferred options.
- 16.7.53 Considering the above, it is concluded that significant waste effects are not expected during construction of the Scheme.

Operational Effects

- 16.7.54 Construction materials required to operate the Scheme are unlikely to be required in large quantities e.g., more than 1% of regional or national construction material availability. Therefore, no significant effects are anticipated.
- 16.7.55 As set out in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**, during operation there are expected to be three full time equivalent (FTE) staff with additional staffing/visitors such as maintenance workers and deliveries attending site on an ad hoc as needed. It is assumed that this will equate to four days of additional worker time per month.
- 16.7.56 Waste arising from this day-to-day operation would include:
- Welfare facility waste; and
 - General waste (paper, cardboard, wood etc).
- 16.7.57 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.

- 16.7.58 During operation, including maintenance activities, waste generation is expected to be minimal, since solar PV panels do not generate any waste as part of the energy production process.
- 16.7.59 Waste arisings associated with maintenance activities such as component replacement during the operational life of the Scheme will be managed in the same way as waste from the final decommissioning of the Scheme.
- 16.7.60 During the operational life of the Scheme, it is expected that there will be requirement for periodic replacement of some of the solar farm elements.
- 16.7.61 **Table 16-27** below summarises the anticipated design life and replacement frequency for the main elements of the Scheme.

Table 16-27. Expected Design Life & Replacement Frequency for Key Components

Component	Comment	Design life / Replacement Frequency	Recyclable
Solar PV panels	It is expected that throughout this period faulty or damaged Solar PV Panels will require replacement as part of normal maintenance operations. There will be no wholesale replacement of solar panels.	As required	Yes
Solar panel mounting structure	Replacement is not anticipated during Scheme operation.	Entire Operational period	Yes
DC cable (low voltage on-site cabling between solar panels and inverters)	It is not anticipated that the DC cables will need to be replaced during operation, although an allowance has been made for up to 20% of the DC cabling to be replaced during the Scheme operation due to damage or defects	Entire Operational period	Yes
Inverters	Assumed design life of 15 years	15 to 20 years	Yes
AC cable (medium voltage on-site cabling)	Replacement is not anticipated during Scheme operation.	Entire Operational period	Yes
Transformers	Assumed design life of 20 years, although replacement will only be carried out if required for performance or health and safety reasons.	20 + years	Yes
Switchgear	Assumed design life of 20 years, although replacement will only be carried out if	20 + years	Yes

Component	Comment	Design life / Replacement Frequency	Recyclable
	required for performance or health and safety reasons.		
132 kV Grid Connection Cable	Replacement is not anticipated during Scheme operation.	Entire Operational period	Yes
Grid Connection Substations	Replacement is not anticipated during Scheme operation.	Entire Operational period.	Yes

Decommissioning Effects

16.1.3 **Table 16-28** summarises the anticipated waste streams from decommissioning, based on the expected maximum number of solar panels.

Table 16-28. Estimated Decommissioning Waste

Waste Type	Estimated Quantity	Recyclable/Recoverable
General waste from site offices and welfare facilities	Minimal	Yes
Waste from the maintenance of vehicles used during decommissioning	Minimal	Yes
Hazardous waste	Minimal	Yes
Concrete and aggregates	7,229 m ³	Yes
Solar panel mounting structure	2,563 m ³	Yes
Cables	9 m ³	Yes
Solar PV Panels	824,121 panels, 95,156 m ³ based on a panel weight of 33.6kg and a density of 0.31 tonnes/m ³ (based on panel dimensions).	Yes
Inverters	19 m ³ (based on a density of 8 tonnes/m ³)	Yes

Waste Type	Estimated Quantity	Recyclable/Recoverable
Transformers	254 m ³ (based on a density of 8 tonnes/m ³)	Yes
Switch gear	21 m ³ (based on a density of 8 tonnes/m ³)	Yes
Total decommissioning waste	105,250 m³	

16.7.62 Recycling routes are generally available for decommissioning materials at present, and it is likely that there will be even greater opportunities for recycling in the future, not least because the market will have expanded to meet demand as solar PV installations increase.

16.7.63 The company “Recycle Solar”, based nearby in North Lincolnshire, reports that 90% of the glass and 95% of the semiconductor materials in end-of-life solar panels can be extracted for use in new PV panels.

16.7.64 The overall recovery rate is therefore expected to be greater than 60% (and potentially greater than 90%). Therefore, the magnitude of impact is Minor or Negligible, which is considered to be not significant.

16.7.65 The overall quantities of decommissioning waste sent to landfill are anticipated to be below 1% of regional inert (250,000 m³) and non-hazardous (450,000 m³) landfill capacity and less than 0.1% of national hazardous (7,900 m³) landfill capacity. Therefore, the magnitude of impact is negligible, and the effect is slight, which is considered to be not significant.

Additional Mitigation, Enhancement, and Monitoring – Materials and Waste

16.7.66 As no materials and waste significant effects have been identified, no further or additional mitigation or monitoring of significant effects are proposed.

Residual Effects – Materials and Waste

16.7.67 As no significant effects were identified in the preliminary assessment, the residual effects remain as outlined above and not significant.

Cumulative Effects – Materials and Waste

16.7.68 This section assesses the potential effects of the Scheme in combination with the potential effects of other proposed and committed plans and projects including other developments (referred to as ‘cumulative schemes’) within the surrounding area.

16.7.69 The cumulative schemes to be considered in combination with the Scheme have been agreed in consultation with relevant Local Planning Authorities and are listed in **Appendix 17-1, ES Volume 2 [EN010106/APP/6.2]**. The

cumulative assessment methodology is presented within **Chapter 5: EIA Methodology, ES Volume 1 [EN010106/APP/6.1]**.

- 16.7.70 This cumulative effect assessment identified for each receptor those areas where the predicted effects of the Scheme could interact with effects arising from other plans and, or projects on the same receptor based on a spatial and, or temporal basis.
- 16.7.71 The mineral planning authority and waste planning authority consider allocated sites and other forms of strategic development. Therefore, consideration has been made at the regional level for the cumulative material use and waste generated by these developments. It is also assumed that each of the cumulative developments will also be considering and implementing the waste hierarchy as per requirements set out in The Waste (England and Wales) Regulations 2011.
- 16.7.72 It is likely that the waste generated by the Scheme during operation and decommissioning would be managed by specialist regional or national facilities, and that such facilities would be developed over the operational period in response to demand generated by the UK-wide PV industry. The capacity of such facilities is not expected to be influenced by other non-solar energy projects in the surrounding area because the facilities will only be managing solar PV waste.
- 16.7.73 Therefore, no cumulative materials and waste impacts have been identified for the Scheme.

16.8 Electric and Electro-Magnetic Fields

Introduction – Electric and Electro-Magnetic Fields

- 16.8.1 This section summarises the effects of the Scheme on Electric and Electro-Magnetic Fields. This includes any significant effects which are likely and the potential for cumulative impacts based on underground cabling. This section has been added in response to comments from the Planning Inspectorate, as presented in **Table 16-29**.
- 16.8.2 Electric fields are the result of voltages applied to electrical conductors and equipment. Fences, shrubs and buildings easily block electric fields. Electro-Magnetic fields are produced by the flow of electric current; however, unlike electric fields, most materials do not readily block electro-magnetic fields. The intensity of both electric fields and electro-magnetic fields diminishes with increasing distance from the source.
- 16.8.3 No overhead electricity cables will be used or constructed as part of the Scheme. With the exception of relatively short lengths of Onsite Electrical Cabling (also known as distribution cabling) connecting the solar panels and the inverters (which is typically above ground level and fixed to the mounting structure, or to other parts of nearby components), all cables will be buried underground. The dimension of the trenches will vary depending on the number of cables or ducts they contain as are further described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**. Underground cables eliminate the electric field altogether as it is screened out by the sheath around the cable, and therefore the assessment only considers electro-magnetic fields.

- 16.8.4 Onsite Electrical Cabling is required to connect the solar panels to inverters and the inverters to the transformers. These low voltage cables are all <1.0 kV. They are anticipated to have a typical maximum installation depth of up to 0.8 m.
- 16.8.5 The medium voltage 33 kV Interconnecting Cables are then required to transfer electricity between the transformers/switchgears at Field Stations and one of the two 33 kV/132 kV Grid Connection Substations located in Solar PV Area 1c. The typical installation depth is expected to be 1.2 m (although potentially deeper at crossings), this is further described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**. The routes of the Interconnecting Cables have been designed to avoid sensitive receptors as far as possible. The majority of Interconnecting Cables lie within the Solar PV Site and Grid Connection Corridor, however approximately 23.5 ha of land is required for the Interconnecting Cables as shown in **Figure 1-3, ES Volume 3 [EN010143/APP/6.3]**.
- 16.8.6 The electricity is then exported from the 33 kV/132 kV Grid Connection Substations to the National Grid Drax Substation by 132 kV Grid Connection Cables. The typical installation depth is expected to be up to 2.0 m and utility surveys will inform positioning. This is further described in **Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1]**.

Legislation, Policy and Guidance – Electric and Electro-Magnetic Fields

- 16.8.7 Legislation, planning policy, and guidance relating to Electric and Electro-Magnetic Fields and pertinent to the Scheme comprises of the documents listed below. More detailed information can be found in **Appendix 16-1, ES Volume 2 [EN010143/APP/6.2]**.

Legislative Framework – Electric and Electro-Magnetic Fields

- a. The Control of Electromagnetic Fields at Work Regulations 2016 (Ref. 16-74)

National Planning Policy – Electric and Electro-Magnetic Fields

- a. National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011) (Ref. 16.74) and the Draft NPS EN-5 (2023) (Ref. 16-75).

Local Policy – Electric and Electro-Magnetic Fields

- b. East Riding Local Plan 2012-2029 (2016) (Ref. 16-58); and
c. East Riding Local Plan Update 2020 – 2039 (2022) (Ref. 16-59)

Guidance – Electric and Electro-Magnetic Fields

- a. DECC (2012). Power Lines: Demonstrating Compliance with EMF public exposure guidelines (Ref. 16-76);
b. National Grid (2015). Undergrounding high voltage electricity transmission lines (Ref. 16-77);
c. Energy Networks Association (2017). Electric and Magnetic Fields (Ref. 16-78);
d. International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998). Guidelines for limiting exposure to time-varying

electric, magnetic and electromagnetic fields (up to 300 GHz) (Ref. 16-79); and

- e. Department of Transport (2002) The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction (updated 2016) (Ref. 16-80).

Consultation – Electric and Electro-Magnetic Fields

- 16.8.8 A scoping exercise was undertaken in September 2022 to establish the content of the assessment and the approach and methods to be followed.
- 16.8.9 The Scoping Report (**Appendix 1-1, ES Volume 2 [EN010143/APP/6.2]**) was issued on 9 September 2022 and records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Scheme on Electric and Electro-Magnetic Fields.
- 16.8.10 The Scoping Opinion was received on 20 October 2022 (**Appendix 1- 2, ES Volume 2 [EN010143/APP/6.2]**). The feedback received from stakeholders at scoping and Applicant responses in relation to Electric and Electro-Magnetic Fields are presented in **Appendix 1-3, ES Volume 2 [EN010143/APP/6.2]**. This is also summarised in **Table 16-29**

Table 16-29. Scoping opinion responses (Electric and Electro-Magnetic Fields)

Consultee	Summary of comment	How matter has been addressed	Location of response
<p>Planning Inspectorate</p>	<p>The Scoping Report provides no consideration of EMF. In line with relevant guidance (DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice (2012)), cables above 132 kilovolts (kV) have potential to cause EMF effects. Although all proposed infrastructure associated with the development (e.g., cables and substations) are below the 132kV threshold, the voltage of the OHL, which are being considered as an alternative to underground cabling, is not provided. Furthermore, there is potential for exceedances of 132kV where infrastructure overlaps.</p> <p>The Inspectorate considers that the ES should demonstrate the design measures taken to avoid the potential for EMF effects from the cable and substation infrastructure on receptors and address the risks to human health arising from EMF to the extent that it is relevant to the nature of the development and where significant effects are likely to occur.</p>	<p>This section of the ES provides an assessment of Electric and Magnetic Fields.</p> <p>It has been confirmed that there will be no overhead electricity cables used or constructed as part of the Scheme and therefore this aspect has not been included in the assessment.</p> <p>The sheathing around underground cables eliminates the electric field altogether and therefore the assessment only considers electro-magnetic fields.</p> <p>All of the cabling used in the Scheme will be 132 kV or less, therefore the assessment looks at the potential for increases in electro-magnetic fields due to overlap of cables.</p> <p>The assessment presented in this section of the ES shows that no significant effects to residential receptors or users of PRoW are predicted to occur due to Electric and Electro-Magnetic Fields generated by the Scheme (either individually or in combination with other electricity infrastructure). Health impacts arising from Electric and Electro-Magnetic Fields have therefore been scoped out of the preliminary assessment and presented in Chapter 14: Human Health, ES Volume 1</p>	<p>Chapter 2: The Scheme, ES Volume 1 [EN010143/APP/6.1] describes the underground cabling used in the Scheme.</p> <p>Paragraph 16.8.23 and 16.8.24.</p> <p>Chapter 14: Human Health, ES Volume 1 [EN010143/APP/6.1] describes and explains why health impacts have been scoped out of the assessment.</p>

Consultee	Summary of comment	How matter has been addressed	Location of response
Planning Inspectorate	The Scoping Report does not make any reference to potential impacts arising from EMF, including on human health receptors. The Applicant is referred to the Inspectorate’s comments at ID 2.2.1 of this Scoping Opinion.	<p>1 [EN010143/APP/6.1]. This approach is summarised and justified in that chapter.</p> <p>The sheathing around underground cables eliminates the electric field altogether and therefore the assessment only considers electro-magnetic fields.</p> <p>An assessment of the potential impacts of electro-magnetic fields is presented in section 16.8.23 and 16.8.24.</p> <p>The assessment presented in this section of the ES shows that no significant effects to residential receptors or users of PRow are predicted to occur due to Electric and Electro-Magnetic Fields generated by the Scheme (either individually or in combination with other electricity infrastructure). Health impacts arising from Electric and Electro-Magnetic Fields have been scoped out of the preliminary assessment presented in Chapter 14: Human Health, ES Volume 1 [EN010143/APP/6.1] as the impacts of Electric and Electro-Magnetic Fields are considered to be not significant. This approach is summarised and justified in that chapter.</p>	<p>Potential impacts of electro-magnetic fields are presented in section 16.8 of Chapter 16: Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1] (this section) at paragraphs 16.8.23 and 16.8.24.</p> <p>Chapter 14: Human Health, ES Volume 1 [EN010143/APP/6.1] describes and explains why health impacts have been scoped out of the assessment.</p>
UK Health Security Agency	It is noted that the current proposals do not appear to consider possible health impacts of EMF	As the assessment presented in this section of the ES shows that no significant effects to residential receptors or users of PRow are predicted to occur due to Electric and Electro-Magnetic	Potential impacts of electro-magnetic fields are presented in section 16.8 of Chapter 16: Other Environmental Topics, ES Volume 1 [EN010143/APP/6.1]

Consultee	Summary of comment	How matter has been addressed	Location of response
		<p>Fields generated by the Scheme (either individually or in combination with other electricity infrastructure) health impacts arising from Electric and Electro-Magnetic Fields have been scoped out of the preliminary assessment presented in Chapter 14: Human Health, ES Volume 1 [EN010143/APP/6.1] as the impacts of Electric and Electro-Magnetic Fields are considered to be not significant. This approach is summarised and justified in that chapter.</p>	<p>(this section) at paragraphs 16.8.23 and 16.8.24.</p> <p>Chapter 14: Human Health, ES Volume 1 [EN010143/APP/6.1] describes and explains why health impacts have been scoped out of the assessment.</p>

- 16.8.11 Further consultation in response to formal pre-application engagement was undertaken through the PEI Report, issued in May 2023. Responses to this statutory consultation are presented in the **Consultation Report [EN010143/APP/5.1]**. No responses from Statutory Consultees were received at statutory consultation relating to Electric and Electro-Magnetic Fields.

Assessment Methodology – Electric and Electro-Magnetic Fields

Assumptions, Limitations and Uncertainties

- 16.8.12 Underground cables eliminate the electric field altogether as it is screened out by the sheath around the cable, but they still produce electro-magnetic fields. Therefore, effects of electric fields are not considered within the assessment, but effects of electro-magnetic fields have been considered further.
- 16.8.13 The Control of Electromagnetic Fields at Work Regulations 2016 (Ref. 16-74) sets out the duties of employers in relation to controlling the risks of electro-magnetic fields to employees. This includes a requirement to assess employees' potential exposure to electro-magnetic fields with reference to action levels (ALs) and exposure limit values (ELVs). Therefore, as the effects of electro-magnetic fields on workers for the Scheme will be controlled and mitigated to acceptable levels through the legislative framework, impacts to workers is not considered within the assessment. The assessment therefore focusses on the potential impacts to the public.
- 16.8.14 Similarly, as noted in NPS EN-5, electric and magnetic fields have the potential to have adverse impacts on aviation (see **Appendix 16-1, ES Volume 2 [EN010143/APP/6.2]**). NPS EN-5 states that the Secretary of State should take account of statutory technical aviation safeguarding zones when assessing DCO applications. These safeguarding zones are defined in Planning Circular 01/0318: Safeguarding Aerodromes, Technical Sites and Military Explosive Storage Areas (Ref. 16-80). The Site is not within the safeguarding zone of any safeguarded civil aerodrome as listed on Annex 3 of the planning circular: Officially safeguarded civil aerodromes. It is noted that the Site is close to Brighton Airfield, but this is not included in Annex 3. Additionally, at the distances of separation between the underground cables and the Grid Connection Substations and potential aviation receptors, the levels of electro-magnetic fields experienced by potential aviation receptors is considered to be negligible and therefore aviation receptors are not included in the assessment.
- 16.8.15 Draft EN-5 (paragraph 2.9.8) (Ref. 16-75) recognises that there is little evidence that exposure of crops, farm animals and natural ecosystems to transmission line electro-magnetic fields has any agriculturally significant consequences. Consequently, consideration of the impacts to agriculture and natural ecosystems has not been included within the assessment.
- 16.8.16 The DECC guidance document (Ref. 16-76) states that underground cables at voltages up to and including 132 kV are considered not capable of exceeding the ICNIRP exposure guidelines for electro-magnetic fields (Ref. 16-79) and that compliance with exposure guidelines for such equipment

can be assumed unless evidence is brought to the contrary in specific cases. However, there is potential for exceedances of 132 kV where infrastructure overlaps. This is considered pertinent as the Scheme plans to route the Grid Connection and Interconnecting Cables in the road or roadside where practicable and potentially increasing the likelihood of the cables encountering other buried electricity infrastructure within these 'services corridors' than if the cables were installed in adjacent agricultural land.

- 16.8.17 The Onsite Electrical Cabling is not considered in the assessment as it has a voltage of less than 1 kV and therefore would not significantly contribute to any increase in electro-magnetic fields should it overlap with other infrastructure.
- 16.8.18 As underground cables at voltages up to and including 132 kV are considered not to exceed the ICNIRP exposure guidelines, the National Grid guidance document (Ref. 16-77) does not provide data for typical and maximum levels of electro-magnetic field generation from cables of this voltage. The document does provide these data for underground 400 kV cables and therefore these data are used in the assessment as a worst case. The use of the data for 400 kV underground is also considered to present a worse case in terms of the voltage which could be generated by the overlap of infrastructure (noting that this may be overlap of different infrastructure associated with the Scheme or of the Scheme and other electricity infrastructure either already in place or proposed).
- 16.8.19 The ICNIRP 'reference levels' for the public are 100 microteslas for electro-magnetic fields (Ref. 16-79). The reference levels are not in themselves limits but provide guidance for assessing compliance with the basic restrictions and reducing the risk of indirect effects. The reference level is the level above which more investigation is needed if this level of exposure is likely to occur. The permitted levels of exposure are somewhat higher, 360 microteslas and 9000 volts per metre. They apply where the time of exposure is significant, for instance in a residence (Ref. 16-77 and Ref. 16-78). As a worst case the lower 'reference level' of 100 microteslas is used in the assessment as the threshold at which potentially significant effects could occur.
- 16.8.20 The National Grid guidance document (Ref. 16-77) states that for a 400 kV cable buried at 0.9 m depth, the typical magnetic field is 24 microteslas when on top of the cable, three microteslas at 5 m from the cable centreline, and 0.9 microteslas at 10 m the cable centreline, with the maximum known by National Grid being 96 microteslas on top of the cable, 13 microteslas at 5 m, and 3.6 microteslas at 10 m. The maximum recorded levels of electro-magnetic field directly above an underground 400 kV cable are therefore less than 30% of the permitted levels and 96% of the reference levels set by ICNIRP (Ref. 16-79).
- 16.8.21 For context, the Energy Networks Association publication 'Electric and Magnetic Fields' (Ref. 16-78) states that in 'the vast majority of homes in the UK, the magnetic field, averaged over 24 hours, is between 0.01 and 0.2 microteslas', but goes on to note that exposure to electro-magnetic fields from a vacuum cleaner is 800 microteslas, reducing to two microteslas at 1 m away, and for a TV, washing machine or microwave

exposure is 50 microteslas next to these appliances and 0.2 microteslas at 1 m distance.

- 16.8.22 Using National Grid's maximum known levels of electro-magnetic field generation for 400 KV cables, the assessment considers that as a worse case a residential receptor would need to be within 5 m of the centreline of a 33 kV Interconnecting Cable or 132 kV Grid Connection Cable, and for the cable to be overlapped by other electricity infrastructure, for the 100 microteslas threshold to be approached and for potentially significant effects to occur.

Assessment of Likely Impacts and Effects – Electric and Electro-Magnetic Fields

- 16.8.23 There are no residential properties within the Order limits. The nearest properties are at least 5 m from the Order limits and it is unlikely cables will be installed that close to any property due to the need for construction vehicles to manoeuvre both sides of the trench within the working width. Cables would be installed at a minimum of 10 m from the façade of any residential dwelling, as confirmed in the **Outline Design Principles Statement [EN010143/APP/7.4]**. Therefore, no significant effects to residential receptors are predicted to occur.
- 16.8.24 Some PRoW do cross over the proposed Interconnecting and Grid Connection Cable Corridors, and may also pass over the Interconnecting and Grid Connection Cables where they are routed within the Solar PV Site. PRoW are shown on **Figure 2-2, ES Volume 3 [EN010143/APP/6.2]**. The presence of the public either directly above or adjacent to underground cables associated with the Scheme would be transient, with the individuals using the PRoW exposed to electro-magnetic fields from the cables for only very short periods of time. It is considered that the level of exposure to users of PRoW would be similar to that associated with general household appliances (and noticeably less than associated with the exposure when using a vacuum cleaner). Therefore, no significant effects to users of PRoW are predicted to occur.
- 16.8.25 Although not raised in consultation for the Scheme, the Applicant is aware that during the examination period of the Gate Burton Energy Park project a query was raised regarding the potential for electro-magnetic fields from cables running under watercourses to impact migratory fish.
- 16.8.26 **Chapter 8: Ecology, ES Volume 1 [EN010143/APP/6.1]** describes the following migratory fish species being present in the River Ouse and River Derwent (Allis shad (*Alosa alosa*); Atlantic salmon (*Salmo salar*); Sea trout (*Salmo trutta*); River lamprey (*Lampetra fluviatilis*) and Sea lamprey (*Petromyzon marinus*)). Data provided on the EMFs.info website (which is run by National Grid on behalf of the UK electricity industry) identifies salmon and trout as being sensitive to Direct Current (DC) electro-magnetic fields⁵, noting that they are expected to be 'much less sensitive' to Alternating Current (AC) fields. The 132 kV Grid Connection Cables are AC.

⁵ It is noted that salmon and lamprey are also sensitive to electric fields, but as stated in paragraph 16.8.3 the electric field of the Grid Connection Cables is screened out by the cable sheath and therefore there will be no impact of the Scheme due to electric fields.

16.8.27 There is limited evidence regarding the impacts of electro-magnetic fields on fish and the major studies which have been undertaken are for subsea cabling⁶ rather than inland (fresh or brackish) waters. However, in its consideration of off-shore wind developments National Policy Statement EN-3: Renewable Energy Infrastructure (Ref. 16-81) states (at paragraph 2.6.76) that electro-magnetic fields from subsea cabling “*may be mitigated by use of armoured cable for inter-array and export cables which should be buried at a sufficient depth. Some research has shown that where cables are buried at depths greater than 1.5 m below the sea bed impacts are likely to be negligible. However sufficient depth to mitigate impacts will depend on the geology of the sea bed*”. Paragraph 2.6.75 states that where the mitigation set out in paragraph 2.6.76 is followed “*the residual effects of EMF on sensitive species from cable infrastructure during operation are not likely to be significant. Once installed, operational EMF impacts are unlikely to be of sufficient range or strength to create a barrier to fish movement*”.

16.8.28 Therefore, considering the following factors:

- a. Salmon and trout are less sensitive to AC than DC electro-magnetic fields;
- b. The AC Grid Connection Cables are sheathed; and
- c. The installation depth of the cables will be at least 5 m below the watercourse bed (secured through the CEMP);

16.8.29 It is considered that there would be no significant effects to the migratory fish species using the River Ouse or River Derwent due to the generation of electro-magnetic fields by the Grid Connection Cables.

Cumulative Effects – Electric and Electro-Magnetic Fields

16.8.30 The assessment presented in paragraphs 16.8.23 and 16.8.24 is a cumulative assessment considering the potential effects of the cabling from the Scheme overlapping with other underground electricity infrastructure, either existing or proposed. No significant cumulative effects have been identified.

⁶ Saltwater conducts electricity more efficiently than freshwater meaning that electro-magnetic effects are greater in the marine environment.

16.9 References

- Ref. 16-1 HM Government (2016). The Air Quality Standards (Amendment) Regulations (2016). SI 2016 No. 1184, His Majesty's Stationery Office. Available at: <https://www.legislation.gov.uk/uksi/2016/1184/contents/made>
- Ref. 16-2 HM Government (1995). The Environment Act. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/contents>
- Ref. 16-3 HM Government (2021). The Environment Act. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Ref. 16-4 HM Government (2023). The Environmental Targets (Fine Particulate Matter) (England) Regulations. Available at: <https://www.legislation.gov.uk/uksi/2023/96/contents/made>
- Ref. 16-5 Department for Environment, Food and Rural Affairs (2000). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Available at: <http://www.gov.scot/resource/doc/1052/0051687.pdf>
- Ref. 16-6 Department for Environment, Food and Rural Affairs (Defra) (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 1 available at: <https://webarchive.nationalarchives.gov.uk/20090810105142/http://www.defra.gov.uk/environment/airquality/strategy/pdf/air-qualitystrategy-vol1.pdf>
Volume 2 available at: <https://webarchive.nationalarchives.gov.uk/20090810105136/http://www.defra.gov.uk/environment/airquality/strategy/pdf/air-qualitystrategy-vol2.pdf>
- Ref. 16-7 Defra (2019). UK Clean Air Strategy 2019. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
- Ref. 16-8 Department for Energy and Climate Change (DECC) (2011) National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
- Ref. 16-9 Department for Energy Security & Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf
- Ref. 16-10 Department for Levelling Up, Housing and Communities (2023) National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf [Date Accessed: 13 September 2023].
- Ref. 16-11 EPUK & IAQM. (2017). Land-Use Planning & Development Control: Planning for Air Quality. Available at: <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>
- Ref. 16-12 HM Government (2023). Environmental Improvement Plan 2023. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf
- Ref. 16-13 Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction. Available at: <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

- Ref. 16-14 Department for Environment, Food and Rural Affairs (2022), Local Air Quality Management Technical Guidance (TG22). Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>
- Ref. 16-15 The Air Quality (England) Regulations (2015). Available at: https://consult.defra.gov.uk/communications/laqm-review-next-steps/supporting_documents/The%20Air%20Quality%20England%20Regulations%202015aa.pdf
- Ref. 16-16 East Riding of Yorkshire (2023). Air Quality Annual Status Report (ASR) Available at: [https://downloads.eastriding.org.uk/corporate/pages/air-quality-monitoring/pdfs/Air%20Quality%20Annual%20Status%20Report%20\(ASR\)%202023.pdf](https://downloads.eastriding.org.uk/corporate/pages/air-quality-monitoring/pdfs/Air%20Quality%20Annual%20Status%20Report%20(ASR)%202023.pdf)
- Ref. 16-17 Selby District Council (2022). Air Quality Annual Status Report (ASR) Available at: https://www.selby.gov.uk/sites/default/files/Documents/17916_19417_SDC_ASR_22.docx
- Ref. 16-18 East Riding of Yorkshire Council (2023). Public Air Quality Portal. Available at: <https://portal.earthsense.co.uk/EastRidingPublic/>
- Ref. 16-19 Defra (2020) 2018 Reference Year Background Maps. Available at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>
- Ref. 16-20 Department of Energy & Climate Change (2011). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
- Ref. 16-21 Department for Business, Energy & Industrial Strategy (2021). Draft National Policy Statement for Renewable Energy (EN-3). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015236/en-3-draft-for-consultation.pdf
- Ref. 16-22 East Riding of Yorkshire Council (2022), East Riding Local Plan Update 2020 – 2039: Proposed Submission Strategy Document Update October 2022. Available at: <https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/local-plan-update/proposed-submission-local-plan-update/>
- Ref. 16-23 Planning Practice Guidance for Renewable and Low Carbon Energy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/225689/Planning_Practice_Guidance_for_Renewable_and_Low_Carbon_Energy.pdf
- Ref. 16-24 CAA (2010). Interim CAA Guidance – Solar Photovoltaic Systems. Available at: <https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&appid=11&mode=detail&id=4370>.
- Ref. 16-25 Civil Aviation Authority (2020). CAP738 – Safeguarding of Aerodromes 3rd Edition. Available at: <https://publicapps.caa.co.uk/docs/33/CAP738%20Issue%203.pdf>.
- Ref. 16-26 FAA (2018), Technical Guidance for Evaluating Selected Solar Technologies on Airports. Available at <https://www.faa.gov/sites/faa.gov/files/airports/environmental/FAA-Airport-Solar-Guide-2018.pdf>

- Ref. 16-27 AA (2021). FAA Policy: Review of Solar Energy Systems Projects on Federally – Obligated Airports. Available at: <https://www.federalregister.gov/documents/2021/05/11/2021-09862/federal-aviation-administration-policy-review-of-solar-energy-system-projects-on-federally-obligated>
- Ref. 16-28 Rail Industry Standard for Signal Sighting Assessment Requirements. Available at: <https://www.rssb.co.uk/standards-catalogue/CatalogueItem/RIS-0737-CCS-Iss-1>.
- Ref. 16-29 BRE (2014). Planning Guidance for the Development of Large-Scale Ground Mounted Solar PV Systems. Available at: https://files.bregroup.com/solar/KN5524_Planning_Guidance_reduced.pdf
- Ref. 16-30 Environment Agency (2020). Land Contamination Risk Management (LC:RM) Guidance. Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>
- Ref. 16-31 Environment Agency, (2010); Guiding Principles for Land Contamination. Available at: <https://www.clare.co.uk/useful-government-legislation-and-guidance-by-country/192-guiding-principles-for-land-contamination-gplc>
- Ref. 16-32 Department for Environment Food & Rural Affairs (2012); Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance 2012. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/223705/pb13735cont-land-guidance.pdf
- Ref. 16-33 CIRIA (2001); Contaminated Land Risk Assessment: A Guide to Good Practice (CIRIA Report C552). Not available online.
- Ref. 16-34 HM Government (2015); The Building Regulations and c. (Amendment) Regulations. Available at: https://www.legislation.gov.uk/uksi/2015/767/pdfs/uksi_20150767_en.pdf
- Ref. 16-35 IEMA (2020) Major Accidents and Disasters in EIA: A Primer. Available at <https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer> [Date Accessed 25/07/2023].
- Ref. 16-36 HMSO (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended by The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018). Available at: http://www.legislation.gov.uk/uksi/2017/572/pdfs/uksi_20170572_en.pdf and http://www.legislation.gov.uk/uksi/2018/695/pdfs/uksi_20180695_en.pdf
- Ref. 16-37 HMSO (2015) Control of Major Accident Hazards (COMAH) Regulations. Available at: <https://www.legislation.gov.uk/uksi/2015/483/contents/made>
- Ref. 16-38 HMSO (2020). National Risk Register 2020. Available at: <https://www.gov.uk/government/publications/national-risk-register-2020> [Date Accessed 24/11/2022].
- Ref. 16-39 HMSO (2023). National Risk Register 2023. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175834/2023_NATIONAL_RISK_REGISTER_NRR.pdf [Date Accessed 24/08/2023].
- Ref. 16-40 HMSO (1974). Health and Safety at Work Act 1974. Available at: https://www.legislation.gov.uk/ukpga/1974/37/pdfs/ukpga_19740037_en.pdf [Date Accessed: 23/03/2022].

- Ref. 16-41 HMSO (1999). The Management of Health and Safety at Work Regulations 1999. Available at: http://www.legislation.gov.uk/uksi/1999/3242/pdfs/uksi_19993242_en.pdf [Date Accessed: 23/03/2022].
- Ref. 16-42 HMSO (1992). The Workplace (Health, Safety and Welfare) Regulations 1992. Available at: <http://www.legislation.gov.uk/uksi/1992/3004/made/data.pdf> [Date Accessed: 09/10/2020].
- Ref. 16-43 HMSO (2015). Construction (Design and Management) Regulations 2015. Available at: http://www.legislation.gov.uk/uksi/2015/51/pdfs/uksi_20150051_en.pdf [Date Accessed: 09/10/2020].
- Ref. 16-44 National Grid (2016). Technical Guidance Note 287: Third-party guidance for working near National Grid Electricity Transmission equipment. Available at: https://www.nationalgrid.com/sites/default/files/documents/8589935533-TGN%20287_Third%20party%20guidance%20for%20working%20near%20NGET%20equipment.pdf [Date accessed 01/09/2023].
- Ref. 16-45 National Grid (2007). Specifications for Safe Working in the Vicinity of National Grid High Pressure Gas Pipelines and Associated Installations - Requirements for Third Parties. Available at: <https://www.nationalgrid.com/sites/default/files/documents/24347-Working%20safely%20in%20the%20vicinity%20of%20above%207bar%200pipelines.pdf> [Date accessed 20/10/2023].
- Ref. 16-46 Northern Gas Networks (2017). Working safely near high pressure gas pipelines and associated installations: Third party requirements. Available at: <https://www.northerngasnetworks.co.uk/wp-content/uploads/2018/02/Working-safely-near-high-pressure-gas-pipelines-and-associated-installations.pdf> [Date accessed 20/10/2023].
- Ref. 16-47 IEMA (2020). IEMA guide to: Materials and Waste in Environment Assessment, Guidance for a Proportionate Approach. Available at: <https://www.iema.net/resources/reading-room/2020/03/30/materials-and-waste-in-environmental-impact-assessment>.
- Ref. 16-48 European Union (2008). Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (2008/98/EC). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705>.
- Ref. 16-49 H.M. Government (2011) Waste (England and Wales) Regulations. Available at: <https://www.legislation.gov.uk/uksi/2011/988/contents/made>
- Ref. 16-50 Department for Environment Food & Rural Affairs Environmental Protection Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref. 16-51 H.M. Government (2016) The Environmental Permitting (England and Wales) Regulations 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1154/contents/made> [Date accessed 30 August 2023].
- Ref. 16-52 H.M. Government (2005). Hazardous Waste Regulations (England and Wales) 2005 (amended in 2016). Available at: <https://www.legislation.gov.uk/uksi/2016/336/contents/made> [Date accessed 30 August 2023].

- Ref. 16-53 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2014) National Planning Policy for Waste. Available at: <https://www.gov.uk/government/publications/national-planning-policy-for-waste>
- Ref. 16-54 HM Government (2021) Waste Management Plan For England. Available at: <https://www.gov.uk/government/publications/waste-management-plan-for-england-2021>
- Ref. 16-55 HM Government, (2018); A Green Future: Our 25 Year Plan to Improve the Environment. Available at: 25 Year Environment Plan
- Ref. 16-56 HM Government (2018). Our Waste, Our Resources: A Strategy for England. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf
- Ref. 16-57 Department for Levelling Up, Housing and Communities. National Planning Policy Guidance (NPPG) For Minerals and Waste. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework/17-facilitating-the-sustainable-use-of-minerals>
- Ref. 16-58 East Riding of Yorkshire Council (2016). East Riding Local Plan 2012-2019 Strategy Document. Available at: <https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/east-riding-local-plan/> [Accessed 08 February 2023].
- Ref. 16-59 East Riding of Yorkshire Council (2022), East Riding Local Plan Update 2020 – 2039: Proposed Submission Strategy Document Update October 2022. Available at: <https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/local-plan-update/proposed-submission-local-plan-update/> [Accessed 08 February 2023].
- Ref. 16-60 East Riding of Yorkshire Council & City of Hull Council (2019) East Riding of Yorkshire and Kingston Upon Hull Joint Minerals Local Plan 2016-2033
- Ref. 16-61 East Riding of Yorkshire Council & City of Hull Council (2004) East Riding of Yorkshire and Kingston Upon Hull Joint Waste Local Plan
- Ref. 16-62 East Riding of Yorkshire Council & City of Hull Council (2004) East Riding of Yorkshire and Kingston Upon Hull Joint Waste Local Plan Update
- Ref. 16-63 North Yorkshire County Council, City of York Council and North York Moors National Park Authority (2022) Minerals and Waste Joint Plan and associated policies map. Available at: <https://www.york.gov.uk/downloads/file/7874/mwjp-minerals-and-waste-joint-plan>
- Ref. 16-64 CL:AIRE (2011). Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice. Available at: <https://www.claire.co.uk/projects-and-initiatives/dow-cop>
- Ref. 16-65 Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering.
- Ref. 16-66 Department for Environment, Food & Rural Affairs and Environment Agency (2016) Waste Duty of Care Code of Practice. <https://www.gov.uk/government/publications/waste-duty-of-care-code-of-practice>
- Ref. 16-67 Defra (2011) Guidance on Applying the Waste Hierarchy. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf.

- Ref. 16-68 Make UK (2019). A new deal for steel: laying the foundations for a vibrant UK steel industry.
- Ref. 16-69 Mineral Products Association (2020) Profile of the UK Mineral Products Industry: 2020 Edition.
- Ref. 16-70 Environment Agency (2022). 2021 Waste Data Interrogator, 2021 Waste Summary Tables for England - Version 3. Available at: <https://www.data.gov.uk/dataset/d8a12b93-03ef-4fbf-9a43-1ca7a054479c/2021-waste-data-interrogator>.
- Ref. 16-71 Defra (2023). UK Statistics on Waste. Available at: <https://www.gov.uk/government/statistics/uk-waste-data/uk-statistics-on-waste#recovery-rate-from-non-hazardous-construction-and-demolition-cd-waste>
- Ref. 16-72 Waste and Resources Action Programme (WRAP) (2007). Waste Recovery Quick Wins. Improving Recovery Rates without Increasing Costs. No longer available online
- Ref. 16-73 Department for Environment Food & Rural Affairs Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance 2012. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/223705/pb13735cont-land-guidance.pdf
- Ref. 16-74 HMSO (2016). The Control of Electromagnetic Fields at Work Regulations. Available at: <https://www.legislation.gov.uk/ukxi/2016/588/contents/made>
- Ref. 16-75 Department for Energy Security & Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147384/NPS_EN-5.pdf
- Ref. 16-76 DECC (2012). Power Lines: Demonstrating Compliance with EMF public exposure guidelines. A voluntary Code of Practice. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48308/1256-code-practice-emf-public-exp-guidelines.pdf [Date Accessed: 12/01/2023].
- Ref. 16-77 National Grid (2015). Undergrounding high voltage electricity transmission lines. Available at: https://www.nationalgrid.com/sites/default/files/documents/39111-Undergrounding_high_voltage_electricity_transmission_lines_The_technical_issues_INT.pdf [Date Accessed: 12/01/2023].
- Ref. 16-78 Energy Networks Association (2017). Electric and Magnetic Fields. Available at: <https://www.energynetworks.org/industry-hub/resource-library/electric-and-magnetic-fields-facts.pdf> [Date Accessed: 13/01/2023].
- Ref. 16-79 International Commission on Non-Ionizing Radiation Protection (ICNIRP) (1998). Guidelines for limiting exposure to time-varying electric, magnetic and electromagnetic fields (up to 300 GHz). Health Phys, 74(4), 494-522.
- Ref. 16-80 Department of Transport (2002) The Town and Country Planning (Safeguarded Aerodromes, Technical Sites and Military Explosives Storage Areas) Direction (updated 2016). Available at: <https://www.gov.uk/government/publications/safeguarding-aerodromes-technical-sites-and-military-explosives-storage-areas> [Date Accessed: 12 September 2023].
- Ref. 16-81 Department for Energy and Climate Change (DECC) (2011) National Policy Statement EN-3: Renewable Energy Infrastructure. Available at: <https://assets.publishing.service.gov.uk/media/5a79c422e5274a684690bf>

[53/1940-nps-renewable-energy-en3.pdf](#) [Date Accessed: 17 November 2023].