BEACON FEN ENERGY PARK

Planning Inspectorate Reference: EN010151

Chapter 16 – Air Quality
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The Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(q)

Revision History

Revision	Revision date	Details	Authorized	Name	Position

List of Outstanding Issues and Information

Outstanding issue/info.	Section/Paragraph	Responsibility	Action

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16. AIR QUALITY

16.1 Introduction

16.1.1 This Chapter reports the preliminary assessment of the likely significant effects of the Proposed Development on Air Quality, in the context of the site and surrounding area. In particular it considers the potential for likely significant effects on sensitive receptor locations with the area around the Proposed Development for the following:

- Dust and particulate matter generation during the construction phase (including the area of expansion to the Bicker Fen substation), and
- Impact of emissions from development-generated traffic in the operational phase.

16.1.2 Sensitive locations are those where the public may be exposed to pollutants generated by the construction and/or operational phases of the Proposed Development. These include locations sensitive to an increase in dust deposition as a result of onsite construction activities or exposure to gaseous pollutants from exhaust emissions from construction traffic, and traffic associated with the operation of the Proposed Development.

16.1.3 Consideration will also be given to any likely significant air quality effects relating to the decommissioning phase, in terms of dust deposition and pollutant emissions associated with construction vehicles.

16.1.4 This Chapter (and its associated figures and appendices) is not intended to be read as a standalone assessment and reference should be made to the front end of this PEIR (Chapters 1 – 5) and particularly to the description of the Proposed Development in Chapter 2 which includes details about the Site, the design parameters and construction methodology, as well as the final chapter, 'Summary of Environmental Effects' (Chapter 17).

16.1.5 This chapter is accompanied by the following Appendices and Figures:

- Appendix 16.1: Legislation, Policy and Guidance
- Appendix 16.2: Assessment Methodology
- Appendix 16.3: Copies of Relevant Correspondence

16.1.6 As set out within Chapter 1, the information set out within this Chapter is preliminary and intended to inform consultees (both specialist and non-specialist) about the likely environmental effects of the Proposed Development, helping to inform their consultation responses.

16.1.7 Consideration of the proposed upgrade to the Bicker Fen Substation has also been accounted for within the construction dust assessment and findings presented in Section 16.6. Reference to these proposed works is included within Chapter 2 of the PEIR which also include the Solar Array Area and the Cable Route Corridor upgrades.

16.2 Legislation and Policy

16.2.1 The legislation and policy considered relevant to the assessment of Air Quality are listed below, with details provided in Appendix 16.1.

Legislative Framework

16.2.2 The applicable legislation includes:

- The Environment Act 2021;
- Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007; and
- The Air Quality Standards Regulations 2010.

Planning Policy

16.2.3 The applicable planning policy includes:

- Emerging National Policy Statements for Energy (EN1, EN3, EN5, Published November 2023); and
- Ministry of Housing, Communities and Local Government, National Planning Policy Framework, September 2023;
- Central Lincolnshire Local Plan (CLLP) (2023).

16.3 Consultation & Scope of Assessment

Consultation Undertaken to Date

16.3.1 Consultation will be ongoing throughout the preparation of the DCO application; to date, it can broadly be divided into the following key stages:

- EIA Scoping;
- Early Non-Statutory Consultation; and
- Direct Topic-Specific Consultation.

16.3.2 Table 16.1 provides a summary of the consultation activities undertaken in support of the preparation of this Chapter. Copies of relevant correspondence are provided in Appendix 16.3.

Table 16.1 – Summary of Consultation Undertaken to Date

ORGANISATION	DATE	FORM OF CONSULTATION	SUMMARY OF CONSULTEE RESPONSE	HOW THIS HAS BEEN ADDRESSED
EIA Scoping				
Planning Inspectorate (PINS)	May 2023	Scoping Opinion – proposed to scope air quality out of the DCO.	**Requested the following aspects be scoped in:** Operational effects (due to replacement of panels and components).	The requested aspects have been addressed as follows: *Traffic data for the operational phase has been reviewed against IAQM assessment

ORGANISATION	DATE	FORM OF CONSULTATION	SUMMARY OF CONSULTEE RESPONSE	HOW THIS HAS BEEN ADDRESSED
				criteria to screen out detailed assessment (Section 16.6.11).
			Construction Dust (due to insufficient information regarding impacts and mitigation being available to scope out).	A full construction dust assessment has been incorporated along with recommended mitigation measures. Traffic data for the construction phase has been reviewed against IAQM assessment criteria to screen out detailed assessment (Sections 16.6.5 – 16.6.12).
			Plant emissions during construction and decommissioning (due to insufficient information available).	Requirements for Non- Road Mobile Machinery (NRMM) to meet emission standards have been included in the Construction Environmental Management Plan (Section 16.3.7).
			Requirement to consider cumulative impacts.	Review of cumulative impacts in relation to a number of schemes has been included (Sections 16.9 and 4.6 of the Scope and Methodology Chapter).

ORGANISATION	DATE	FORM OF CONSULTATION	SUMMARY OF CONSULTEE RESPONSE	HOW THIS HAS BEEN ADDRESSED
			Agreed to scope out: Dust impacts on designated habitat sites.	No sites identified meeting IAQM criteria, i.e. within 50m of site boundaries or trackout routes (Section 16.3.5).
			Operational phase traffic emissions subject to confirmation that vehicle numbers do not exceed IAQM thresholds.	As above* where traffic data has been scoped in to be reviewed, which resulted in scoping out the need for a detailed assessment (Section 16.6.11).
Early Non-Statutory Consultation				
N/A			Non-statutory feedback has been reviewed and does not contain any comments relevant to the air quality assessment.	
Direct Topic-Specific Consultation				
North Kesteven District Council (NKDC)	23/06/2023	Email consultation: Wardell Armstrong (WA) proposed that a construction dust assessment would be undertaken in-line with IAQM guidance. In relation to potential impacts from vehicle emissions, WA proposed to review traffic data for the construction and operational phases against the IAQM/EPUK assessment criteria, proceeding to detailed assessment only if these criteria were exceeded.	Confirmed NKDC's agreement with this proposed approach.	Construction Dust Assessment included in PEIR (Section 16.6.5 – 16.6.12).

ORGANISATION	DATE	FORM OF CONSULTATION	SUMMARY OF CONSULTEE RESPONSE	HOW THIS HAS BEEN ADDRESSED
		NKDC had previously requested consideration of possible cumulative traffic impacts in relation to Heckington Fen Solar Park and Springwell Solar Park, and possibly also to include the Viking Link and Triton Knoll projects.		Review of cumulative impacts in relation to a number of schemes has been included (Sections 16.9 and 4.6 of the Scope and Methodology Chapter).
Environment Agency (EA)	23/06/2023 – 26/06/2023	Email consultation	The Environment Agency (EA) has previously requested consideration of control of emissions from onsite NRMM used in construction and recommended that any NRMM of 36kW to 560kW meets or exceeds latest emission standards in Regulation (EU) 2016/1628. WA proposed to seek clarification from Low Carbon (Applicant) to confirm that this is the case; if so, emissions from NRMM can be scoped out on the basis of guidance from EPUK/IAQM and from the Local Air Quality Management Technical Guidance (LAQM.TG(22). Ms Griffiths confirmed agreement on behalf of the EA, further noting that although the EA comments were advisory, PINS had requested inclusion of plant emissions during construction unless robust	Justification provided in PEIR for scoping, on grounds that emission standards for NRMM will be included in CEMP (Section 16.3.7).

ORGANISATION	DATE	FORM OF CONSULTATION	SUMMARY OF CONSULTEE RESPONSE	HOW THIS HAS BEEN ADDRESSED
			justification could be given for scoping out.	
Natural England (NE)	23/06/2023 – 14/07/2023	Email consultation	WA proposed that dust impacts on designated habitat sites can be scoped out as there are no designated habitat sites within the vicinity of the development (i.e. up to 50 m from construction sites and/or haul routes and for up to 500 m from site entrances). In relation to vehicle emissions, WA proposed that detailed assessment would be scoped out, subject to review of traffic data against the appropriate criteria from NE and the IAQM. Confirmed that NE agreed with WA's proposed approach.	Traffic data has been reviewed and it is confirmed that impacts on designated habitat sites can be screened out (Section 16.3.5).

Scope of the Assessment

Introduction

16.3.3 The Chapter of the PEIR addresses the potential effects of the Proposed Development on air quality. The scope of works to be considered within the air quality assessment is summarised as follows:

- A review of the current baseline and future air quality baseline conditions during the construction and operation of the Proposed Development;
- A qualitative assessment in order to consider the potential effects of construction of the Proposed Development on air quality for human health and ecosystems associated with construction traffic, construction plant emissions and construction dust and particulates;
- A qualitative assessment to consider the potential effects of development-generated traffic of the Proposed Development on air quality for human health and ecosystems associated with the operational phase;

- A summary of residual air quality and dust effects;
- The cumulative effects of emissions associated with the Proposed Development and other committed developments in the vicinity; and
- Discussion of recommended mitigation.

Effects not considered within the Scope

16.3.4 Review of traffic data (Chapter 9 Access and Traffic) for the construction and operational phases confirms that overall traffic generation does not exceed the thresholds for detailed assessment set out by the Institute for Air Quality Management, and therefore a detailed (i.e. modelled) assessment has not been undertaken.

16.3.5 Designated statutory and non-statutory habitat sites have not been considered within the scope of the operational phase assessment, as a review of the traffic data confirms that the relevant assessment thresholds in the IAQM[1] and Natural England guidance[2] documents are not exceeded. The screening criteria follow the superseded Design Manual for Roads and Bridges (DMRB) guidance, requiring that sites which are located within 200m of an 'affected' road, need to be considered. Roads are deemed 'affected' if a proposed development leads to:

- A change in road alignment of 5m or more;
- A change in daily traffic flow of 1,000 AADT or more;
- A change in HGV flow of 200 AADT or more;
- A change in daily average speed of 10 kph or more; and
- A change in peak hour speed of 20kph or more.

16.3.6 Within the Scoping Report (Appendix 1.3) it was proposed to scope out impacts during the operational and decommissioning phases. This is because air quality impacts during the operational phase are likely to be very limited and air quality background conditions during the decommissioning phase cannot be forecast with certainty due to the 40-year long operational phase timespan. As such, these phases will not be considered further here but an outline Decommissioning Environmental Management Plan (DEMP) will be submitted as part of the ES.

16.3.7 It is assumed that NRMM 36kW to 560kW used on-site in construction, maintenance and decommissioning will comply with the latest emission standards in Regulation (EU) 2016/1628 and therefore does not require detailed assessment. This has been specified for inclusion in the DEMP.

16.3.8 No demolition activities are anticipated within the Proposed Development area and this has, therefore, not been considered further within the construction dust assessment.

[1] Holman et al (2020). A guide to the assessment of air quality impacts on designated nature conservation sites – version 1.1, Institute of Air Quality Management, London
[2] Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001) (2018)

Limitations & Exclusions

16.3.9 The information within this Chapter is preliminary and intended to inform consultees. As such, this PEIR has been prepared at a point in the design process when parameters of the design are certain enough for an assessment to be based upon, but there is still sufficient flexibility to incorporate feedback from consultees.

16.4 Assessment Methodology & Significance Criteria

Extent of the Study Area

16.4.1 For the construction phase assessment, existing sensitive human receptors located within 250m of the Site boundary and/or within 50m of the route that construction vehicles will take (within up to 500m from the Site entrance) have been identified.

16.4.2 The Construction Dust receptors and construction traffic route, considered within the assessment, are illustrated on diagram ST19595-184 Construction Dust Receptor Plan.

16.4.3 For the operational phase assessment, traffic data has been reviewed against EPUK/IAQM criteria in order to determine the extent of the road network to be included within the air quality study area. Existing Sensitive Receptor (ESR) locations have been identified within 200m of the roads that will be affected by development-generated vehicles.

16.4.4 These criteria and distances are taken from the relevant guidance detailed in Appendix 16.2 and have been applied using the methodologies also detailed in Appendix 16.2.

Assessment Methodology

Guidance

16.4.5 The applicable guidance is summarised as follows:

- Department for Communities and Local Government, Planning Practice Guidance: Air Quality, November 2019;
- Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance, August 2022 (LAQM.TG(22));
- Guidance on the Assessment of Dust from Demolition and Construction[3]; and
- Land-Use Planning and Development Control: Planning for Air Quality[4].

[3] Holman et al (2023). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/ text/guidance/construction-dust-2023.pdf
[4] Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.

Assessment Methodology

16.4.6 The method of baseline data collection and assessment has been carried out in accordance with current guidance and industry best practice. Full details are provided in Appendix 16.2.

Construction Phase Impacts– Dust and Particulate Matter Emissions

16.4.7 In order to assess the impacts associated with dust and PM_{10} releases during the construction phase of the Proposed Development, an assessment has been undertaken in accordance with guidance from the Institute of Air Quality Management (IAQM)[5]. Further details of the construction assessment methodology are provided in Appendix 16.2. The closest sensitive human receptor locations to where construction phase activities will take place are detailed in Table 16.2, below.

16.4.8 The main activities involved with the construction phase of works are as follows:

- **Earthworks** that may be required prior to the construction phase of works. The main sources of dust can include:
  - Clearing the Site;
  - Stripping and stockpiling of topsoil and subsoil;
  - Ground excavation;
  - Bringing in, tipping and spreading materials on Site;
  - Stockpiling materials;
  - Levelling ground;
  - Trenching;
  - Road construction; and
  - Vehicle movements on Site roads.

- **Construction** that will involve the construction of internal roads, car parking areas and any buildings / structures; and
- **Trackout,** which is defined as the transport of dust and dirt by vehicles, travelling from a construction site on to the public road network. This may occur through the spillage of dusty materials onto road surfaces or through the transportation of dirt by vehicles that have travelled over muddy ground on the Site. This dust and dirt can then be deposited and resuspended by other vehicles.

Table 16.2: Existing Dust Sensitive Receptors – Human Receptors

RECEPTOR	DIRECTION FROM THE SITE	APPROXIMATE DISTANCE FROM THE SITE BOUNDARY
Northern Solar Farm		
Existing residential property on Black Drove	Central	100m at closest point
Existing residential properties on Ferry Lane	North	20m at closest point
Westmoorland Farms/Fen Farm	South	<10m at closest point

[5] Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, 2023

RECEPTOR	DIRECTION FROM THE SITE	APPROXIMATE DISTANCE FROM THE SITE BOUNDARY
Existing residential properties in village of Howell	South/West	10m at closest point
Existing residential properties in village of Ewerby Thorpe	West	35m at closest point
Cable Corridor		
Existing residential properties on Star Fen Road	Central	10m at closest point
Existing residential properties on Littleworth Drive	Central/West	10m at closest point
Existing residential properties on A17	West	25m at closest point
Existing residential properties on A17	East	25m at closest point
Existing residential properties on Carterplot Road	Central	Within cable corridor
Existing residential properties on Great Hale Drove	South	<10m at closest point
Existing residential properties on Timms's Drove	South	250m at closest point
Existing residential properties on A17 Station Road	East	55m at closest point
Existing residential property on North Drove	Central	Within cable corridor
Existing residential properties on North Drove	East	100m at closest point
Existing residential properties on Cowbridge Road	South-east	200m at closest point
Existing residential property on Bicker Drove	Central	Within cable corridor
Access Road		
Existing residential property on Asgardby Road	Northwest	30m at closest point
Boughton Cottages, Howell Road	South	Adjacent to boundary
Boughton House	South	200m
Boughton Barns	South	250m
Existing residential property on Asgardby Road	South	40m
Existing residential properties on Asgardby Road	East	140m at closest point

16.4.9 The criteria used to assess the impact of the Proposed Development and the associated significance of effects at ESRs are included in Appendix 16.2.

16.4.10 To assess the impacts associated with road traffic emissions during the construction phase, traffic data for development-generated traffic have been reviewed against the appropriate criteria for determining the requirement for detailed assessment in the guidance from Environmental Protection UK (EPUK) and the IAQM[6]. This review (see sections 16.6.11 – 16.6.12 for detail)

[6] Moorcroft and Barrowcliffe et al, Land-Use Planning and Development Control: Planning for Air Quality (v1.2), January 2017.

confirms that detailed assessment air quality assessment using the dispersion model, ADMS-Roads will not be required.

16.4.11 Guidance from the IAQM sets out the thresholds for traffic generation which require a detailed assessment for vehicle emissions, which are:

- A change of 100 AADT or 25 AADT for heavy-duty vehicles inside an AQMA; and
- A change of 500 AADT or 100 AADT for heavy-duty vehicles outside an AQMA.

16.4.12 As the development is not within or near to any AQMAs, the higher thresholds apply. It has been confirmed by the transport consultants that the overall traffic generation for the construction phase will be up to 75 AADT overall and 49 AADT for HGVs, which is well below the applicable criteria (also see Chapter 9 Access and Traffic for further detail). On this basis, it is considered that a detailed assessment is not required, as the traffic generation is below the level which would lead to a significant adverse effect.

Operational Phase Impacts

16.4.13 To assess the impacts associated with road traffic emissions during the operational phase, traffic data for development-generated traffic have been reviewed against the appropriate criteria for determining the requirement for detailed assessment in the guidance from Environmental Protection UK (EPUK) and the IAQM[7]. This review (see section 16.6.13 for detail) confirms that detailed assessment air quality assessment using the dispersion model, ADMS-Roads will not be required.

Significance Criteria

16.4.14 The construction phase assessment for ESRs takes into account the significance criteria used in the IAQM guidance and the operational phase assessment for ESRs takes into account the significance criteria detailed in the EPUK/IAQM guidance (see Appendix 16.2 for more detail).

16.4.15 Effects that are deemed to be significant for the purposes of this assessment are those that are described as being of a moderate or substantial (beneficial or adverse) level under the relevant IAQM guidance.

16.5 Baseline Conditions

Current Baseline Conditions

Sensitive Receptors

16.5.1 The Proposed Development is primarily located within the administrative area of North Kesteven District Council (NKDC), which is responsible for the management of local air quality within the district. The southernmost part of the cable route and Bicker Fen substation are within the administrative area of neighbouring Boston Borough Council (BBC).

[7] Moorcroft and Barrowcliffe et al, Land-Use Planning and Development Control: Planning for Air Quality (v1.2), January 2017.

16.5.2 The most recent Air Quality Annual Status Report (ASR) 2022[8] states that there are currently no Air Quality Management Areas (AQMAs) declared within NKDC's administrative area.

16.5.3 The closest AQMA to the site is the BBC Haven Bridge AQMA, which is located in the centre of Boston, approximately 17 km east of the Site. The Site is therefore not located in or near to any existing AQMA or a known area of concern for air quality in relation to human health.

16.5.4 In 2021, NKDC undertook air quality monitoring by means of nitrogen dioxide (NO_2) diffusion tubes at 22 locations (the most recent available published data). The closest location to the Site is a kerbside location in Heckington, approximately 2.7 km to the south of the Site, and reported an annual mean concentration for NO_2 of 15.8 µg/m^3, which is well below the annual mean objective of 40 µg/m^3.

16.5.5 In order to provide information on the local background air quality in the absence of data being available from a representative background monitoring location, background pollutant concentrations have been obtained from the 2018-based default concentration maps provided by Defra on their Local Air Quality Management web pages[9]. The background concentrations used in the assessment are detailed in Table 16.3, below.

Table 16.3: Background NO_x, NO_2 and PM_{10} Concentrations Obtained from the 2018-Based Defra Default Concentration Maps

GRID SQUARE	2023 BACKGROUND CONCENTRATIONS (µg/m^3)			
	OXIDES OF NITROGEN (NO_x)	NITROGEN DIOXIDE (NO_2)	FINE PARTICULATE MATTER (PM_{10})	FINE PARTICULATE MATTER ($PM_{2.5}$)
514500, 347500	8.43	6.60	15.18	8.14

Sensitive Receptors

16.5.6 In summary, the key sensitive receptors within the study area comprise:

- Dust-sensitive receptors within 250m of the solar array area (see Table 16.2);
- Dust-sensitive receptors within 250m of the cable corridor (see Table 16.2); and
- Dust-sensitive receptors within 250m of the proposed access road.

Future Baseline Conditions

16.5.7 It is assumed that the future baseline pollutant concentrations at the site would be reduced compared to the present level, continuing the existing trend. Emissions due to road traffic, particularly those of NO_2, are gradually declining owing to changes in the composition of the vehicle fleet with improving emission performance of newer vehicles and the increasing uptake of low-emission vehicles and electric vehicles (EVs).

[8] NKDC, Air Quality Annual Status Report, June 2022.
[9] Defra LAQM webpages (http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html).

16.6 Assessment of Effects

Embedded Mitigation

16.6.1 In accordance with the methodology detailed in the IAQM guidance, the construction phase assessment assumes that no site-specific mitigation measures are applied, except those required by legislation such as on-site activities to operate in accordance with the Environmental Permitting Regulations 2010, i.e. Process Guidance Notes 3/16 and 3/1. Further information relating to legislation to control dust emissions from construction sites is provided in Sections 4.1 and 7.1 of the IAQM guidance.

16.6.2 In relation to undertaking the construction dust risk assessment, assuming no mitigation, Section 7.1 of the IAQM Guidance) states that:

"A site is allocated to a risk category based on two factors: • the scale and nature of the works, which determines the potential dust emission magnitude as small, medium or large (STEP 2A); and • the sensitivity of the area to dust impacts (STEP 2B), which is defined as low, medium or high sensitivity. These two factors are combined in STEP 2C to determine the risk of dust impacts with no mitigation applied"

16.6.3 Further additional site-specific measures such as the preparation of a (best practice) Dust Mitigation Plan (DMP) are recommended where the risk of dust impacts is not classed as negligible (see section 16.7).

16.6.4 No embedded mitigation measures have been considered in relation to the operational phase assessment.

Assessment of Effects

Construction Phase - Dust and Particulate Matter Emissions

16.6.5 Following on from Step 1 of the construction phase dust assessment which screens the need for an assessment (i.e. identifying if there are receptors within 250m of works/50m of trackout), Step 2A defines the potential dust emission magnitude from demolition, earthworks, construction and trackout in the absence of site-specific mitigation. Examples of the criteria for the dust emission classes are detailed in the IAQM guidance and in Appendix 16.2.

16.6.6 Step 2B of the construction phase dust assessment has defined the sensitivity of the area, taking into account the significance criteria detailed in Tables 16.3 to 16.7 in Appendix 16.2, for earthworks, construction and trackout. The sensitivity of the area to each activity is assessed for potential dust soiling and human health.

16.6.7 For earthworks and construction, there are currently between 10 and 100 receptors (residential) within 50m of where these activities may take place, which is assumed to be the redline boundary of the solar array area and the cable corridor for the purposes of this assessment.

16.6.8 The assessment of trackout is based on the final construction route running southwest from the solar array and joining the A17. As a result, for trackout, there are between 1 and 10 receptors (residential and commercial) within 50m

of where trackout may occur for a distance of up to 500m from the Site entrance.

16.6.9 Step 2C of the construction phase dust assessment has defined the risk of impacts from each activity. The dust emission magnitude is combined with the sensitivity of the surrounding area. The risk of dust impacts from each activity, with no mitigation in place has been assessed in accordance with the criteria detailed in Tables 16.8 to 16.10 within Appendix 16.2.

Summary of Step 2

16.6.10 Table 16.4, below, details the results of Step 2 of the construction phase assessment for human receptors, concluding the final derived risk categories (in the absence of site-specific mitigation) in Step 2C, where dust soiling risk ranges between low and medium and human health risk is low for the earthworks, construction and trackout activities.

Table 16.4: Construction Phase Dust Assessment for Human Receptors

	ACTIVITY			
	DEMOLITION	EARTHWORKS	CONSTRUCTION	TRACKOUT
Step 2A				
Dust Emission Magnitude	N/A	Large[a]	Medium[b]	Large[c]
Step 2B				
Sensitivity of Closest Receptors	N/A	High	High	High
Sensitivity of Area to Dust Soiling Effects	N/A	Medium	Medium	Low
Sensitivity of Area to Human Health Effects	N/A	Low[d]	Low[d]	Low[d]
Step 2C				
Dust Risk: Dust Soiling	N/A	Medium Risk	Medium Risk	Low Risk
Dust Risk: Human Health	N/A	Low Risk	Low Risk	Low Risk

a. Total site area estimated to be more than 110,000m^2 – worst-case assumption.
b. Total building volume estimated to be 12,000 – 75,000m^3, with potentially dusty construction materials – worst-case assumption.
c. Number of construction phase vehicles predicted to be greater than 50 peak movements per day.
d. Background annual mean PM_{10} concentration is taken from the LAQM Defra default concentration maps, for the appropriate grid square for 2023.

Construction Phase Assessment – Vehicle Emissions

16.6.11 Guidance from the IAQM sets out the thresholds for traffic generation which require a detailed assessment for vehicle emissions, which are:

- A change of 100 AADT or 25 AADT for heavy-duty vehicles inside an AQMA; and
- A change of 500 AADT or 100 AADT for heavy-duty vehicles outside an AQMA.

16.6.12 As the development is not within or near to any AQMAs, the higher thresholds apply. It has been confirmed by the transport consultants that the overall traffic generation for the construction phase will be up to 75 AADT overall and 49 AADT for HGVs, which is well below the applicable criteria (also see Chapter 9 Access and Traffic for further detail). On this basis, it is considered that a detailed assessment is not required, as the traffic generation is below the level which would lead to a significant adverse effect.

Operational Phase

16.6.13 Likely significant effects on air quality arising from development-generated traffic is not anticipated during the operational phase. This is due to the solar array and cable route generating very low levels of vehicular traffic during the operational phase; typically one vehicle per week travelling to / from the Proposed Development and between fields comprising the Proposed Development for maintenance and security purposes (as detailed in Chapter 9 Access and Traffic). On this basis, it is considered that a detailed assessment is not required, as the traffic generation is below the level which would lead to a significant adverse effect. Replacement of equipment (such as panels and transformers) will generate more traffic, but such events are likely to be sporadic and infrequent and are therefore unlikely to have an adverse effect on local air quality.

Decommissioning Phase

16.6.14 It is anticipated that the potential impacts and mitigation measures are likely to be similar to the construction phase, but on the basis that it is not possible to accurately predict what the air quality baseline will be at the end of the 40-year lifetime of the Proposed Development (in terms of background concentrations, vehicle emission factors and fleet composition), it is not possible to undertake a meaningful assessment at this stage. An outline DEMP will be submitted as part of the ES.

16.7 Mitigation

Construction Phase

Step 3 - Site-specific Mitigation

16.7.1 During the construction phase, the implementation of effective mitigation measures will substantially reduce the potential for nuisance dust and fine particulate matter to be generated.

16.7.2 Step 2C of the construction phase assessment identified that:

- The risk of dust soiling effects is classed as medium for earthworks and construction, and low for trackout; and
- The risk of human health effects is classed as low for earthworks, construction and trackout.

16.7.3 This assumes that no mitigation measures are applied, except those required by legislation. Site-specific mitigation measures do not need to be recommended if the risk category is 'negligible'.

16.7.4 The risk of dust soiling and human health effects are not negligible for all activities. Therefore, site-specific mitigation will be implemented via a DMP and/or as part of the Construction Environmental Management Plan (CEMP) to ensure dust effects from these activities will be Not Significant. This may include, but not limited to, the following:

- Adopting and adhering to industry approved best working practices throughout the construction phase;
- Avoiding activities that generate large amounts of dust during windy conditions;
- Avoiding dry sweeping of large areas;
- Using 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;
- Ensuring vehicles entering and leaving the Site are covered to prevent escape of materials during transport;
- Implementing a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable);
- Minimising of vehicle movements and limitation of vehicle speeds (the slower the vehicle speeds, the lower the dust generation);
- Ensuring there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever the size and layout permits; and
- Access gates to be located at least 10m from receptors, where possible.

16.7.5 All NRMM of 36kW to 560kW used on-site in construction, maintenance and decommissioning should meet or exceed the latest emission standards in Regulation (EU) 2016/1628.

16.7.6 Any dust and air quality complaints should be recorded and appropriate measures should be taken to identify causes and reduce emissions in a timely manner. Exceptional incidents that cause dust and/or emissions and the action taken to resolve the situation should be recorded in a logbook and made available to NKDC on request.

16.7.7 It is recognised that the final design solutions will be developed with the input of the appointed contractor to maximise construction efficiencies, to use modern construction techniques and sustainable materials and to incorporate the particular skills and experience offered by the appointed contractor.

16.8 Residual Effects

Construction Phase

Step 4 – Residual Effects

16.8.1 Step 4 of the construction phase dust assessment has been undertaken to determine the significance of the dust effects arising from earthworks, construction and trackout associated with the Proposed Development.

16.8.2 The implementation of effective mitigation measures during the construction phase, such as those detailed in Step 3, will substantially reduce the potential for nuisance dust and fine particulate matter (PM) to be generated. Any residual impacts should be direct, temporary, medium-term and the level of effects, **Not Significant.**

Construction Phase Assessment – Road Traffic Emissions

16.8.3 Taking into account that development-generated traffic is not expected to exceed the relevant criteria for detailed assessment under the IAQM/EPUK guidance, the residual impacts of the Proposed Development on human receptors during the construction phase is considered to be direct, temporary, medium-term and the level of effect, **Not Significant**.

Operational Phase Assessment – Road Traffic Emissions

16.8.4 Taking into account that development-generated traffic is not expected to exceed the relevant criteria for detailed assessment under the IAQM/EPUK guidance, the residual impacts of the Proposed Development on human receptors during the operational phase is considered to be direct, permanent, long-term and the level of effect, **Not Significant**, and on this basis no additional mitigation has been identified as required.

16.9 Assessment of Cumulative Effects

Intra-Cumulative Effects

16.9.1 Regarding intra-cumulative effects, the online Multi-Agency Geographic Information for the Countryside (MAGIC) resource shows that there are no potentially sensitive designated habitat sites within sufficiently close proximity to the Proposed Development to be affected by construction dust, or which meet the IAQM and Natural England thresholds for development traffic impact. Therefore, from an air quality perspective, ecological effects do not need to be considered for either the construction or operational phase of the Proposed Development. Aside from ecology, there are no other inter-cumulative effects on sensitive receptors associated with other environmental disciplines.

Inter-Cumulative Effects

16.9.2 Regarding inter-cumulative effects, traffic data has been reviewed in combination with other committed schemes (Section 4.6 of Chapter 4), such that the cumulative impact of the Proposed Development along with other developments has been assessed and is considered not to be significant primarily due to the low level of traffic generation arising from the Proposed Development.

16.9.3 There is potential for cumulative effects in relation to construction dust in the event that construction of the Proposed Development was to overlap with that of certain nearby developments; namely: Planning Application references 14/1034/EIASCR; 17/1200/FUL; B/21/0121; B/21/0443; B/22/0198; B/22/0356 and B/17/0340. However, taking into account that the residual effect of construction dust from the Proposed Development is expected to be "not significant" and that those developments granted planning permission would have their own construction dust mitigation measures implemented via CEMPs, DMPs etc. to reduce residual effects to a "not significant" level, it is not expected that there would be a significant cumulative effect. Moreover, such effects would only be temporary in nature, lasting only for the duration any period of overlap of construction works.

16.10 Summary

16.10.1 The baseline air quality in the vicinity of the proposed development is considered to be good. The site is not within, or in proximity to, any existing AQMA or area of known poor air quality, and the available air quality data from the nearest monitoring locations and the Defra Background Maps confirms that pollutant concentrations in the local area are well below the relevant objectives and target levels, even at roadside locations.

16.10.2 A qualitative assessment of construction dust impacts has been undertaken in line with the IAQM Guidance. In relation to impacts of development-generated vehicle emissions, traffic data for the construction and operational phases of the development has been reviewed against the appropriate IAQM guidance criteria, to determine if there is any requirement for detailed assessment.

16.10.3 During the construction phase, site-specific mitigation (e.g. best practice DMP) would be implemented at the Site (via the CEMP), as detailed in Section 16.7 above. No specific requirements for mitigation in the operational phase have been identified. During the decommissioning phase, site specific mitigation would be implemented at the site via the DEMP.

16.10.4 With appropriate site-specific construction dust mitigation in place, the residual effects on receptor locations are considered to be direct, temporary, medium-term and the level of effect **not significant**. Review of traffic data for the construction phase confirms that the relevant assessment thresholds will not be exceeded, and therefore the residual effects on receptor locations are considered to be direct, temporary, medium-term and the level of effect **not significant**. Based on information detailed in the Chapter 9 Access & Traffic of the PEIR, it is considered that the residual effect of operational phase traffic generation on local air quality will be **not significant**.

16.10.5 It has been determined that both intra-cumulative effects and inter-cumulative effects will be **not significant**.

16.10.6 A summary of the likely significant residual effects of the Proposed Development on the receptors considered within this chapter are summarised in Table 16.5 below.

Table 16.5: Discipline - Summary Assessment Matrix

ISSUE	DESCRIPTION OF IMPACT	GEOGRAPHICAL SIGNIFICANCE							IMPACT	NATURE	SIGNIFICANCE	MITIGATION MEASURES
		I	N	R	C	D	P	L				
Air Quality												
No Significant Effects												
Key: Geographical Significance: I = International N = National R = Regional C = County D = District P = Parish L = Low to Local Nature: St = Short Term Mt = Medium Term Lt = Long Term R = Reversible Ir = Irreversible												

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