



Tillbridge Solar

PEI Report Volume I Chapter 6: Air Quality
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6. Air Quality

6.1 Introduction

6.1.1 This chapter presents the findings of an assessment of the likely significant effects on air quality as a result of the Scheme. For more details about the Scheme, refer to **PEI Report Volume I Chapter 3: Scheme Description**.

6.1.2 The assessment relates to dust generation from activities on site during the construction phase. A qualitative dust risk assessment has been conducted for a Study Area comprising the Scheme and surrounding area.

6.1.3 This chapter is supported by the following appendices in **PEI Report Volume II**:

- **Appendix 6-1: Dust Risk Assessment.**

6.1.4 This chapter is supported by the following figures in **PEI Report Volume III**.

- **Figure 6-1: Baseline Air Quality Monitoring Locations;** and
- **Figure 6-2: Dust Risk Assessment Zones.**

6.2 Legislation and Planning Policy

6.2.1 Legislation, planning policy, and guidance relating to Air Quality, and pertinent to the Scheme comprises:

Legislation

- Environment Act 2021 (Ref. 6-3) which amends the Environment Act 1995 (Ref. 6-4) and establishes a legally binding duty on government to bring forward at least two new air quality targets in secondary legislation;
- UK Air Quality Strategy (Ref. 6-5) sets out the current assessment criteria (air quality objectives) applicable to the protection of human health and Local Air Quality Management (LAQM);
- The 25 Year Environment Plan (Ref. 6-6) sets out the actions the UK Government will take to help the natural world regain and retain good health referencing several actions that are being taken to improve air quality including the publication of the Clean Air Strategy. This has recently been updated by the Environment Improvement Plan 2023, which is the first revision of the 25 Year Environmental Plan (Ref. 6-7); and
- UK Clean Air Strategy (Ref. 6-8) which outlines how improvements to air quality are to be achieved in the UK.
- Air Quality Standards Regulations 2010 (Ref. 6-9) (as amended by the Air Quality Standards (Amendment) Regulations 2016 (Ref. 6-10)) set out the air quality objectives to be achieved.

National Policy

6.2.2 As outlined in **PEI Report Volume I Chapter 1: Introduction**, in the absence of an adopted NPS specifically for solar development, the DCO application will be determined with reference to all matters that are considered important and relevant as per Section 105(2) of the Planning Act 2008. As such the EIA must have regard to the relevant policies of the relevant NPSs both adopted and draft and also the NPPF. Key aspects of the NPPF and relevant NPSs, which have been considered during the development of this chapter, are outlined below:

- NPS for Energy (EN-1) (Ref. 6-11), with particular reference to Section 5.2, which sets out national planning policy with respect to air quality and emissions in relation to energy development. Substantial weight should be given to air quality considerations where a project would lead to a deterioration in air quality within an area and consideration should be given against relevant statutory air quality limits;
- Draft NPS for Energy (EN-1) (Ref. 6-12), with particular reference to Section 5.2, which also refers to emerging national policy with respect to air quality and emissions, including details in relation to potential mitigation. This section reiterates the requirements and considerations as set out in the adopted NPS EN-1, but also includes reference to Local Air Quality Management Areas that should be taken into account and engagement made with relevant authorities where necessary;
- Draft NPS for Renewable Energy Infrastructure (EN-3) (Ref. 6-13), which sets out solar photovoltaic generation impacts on construction, including traffic and transport noise and vibration; and
- NPPF (Ref. 6-14), with particular reference to paragraph 186 in relation to air quality in planning decisions, and paragraph 183 in relation to the different roles of a planning authority and a pollution control authority. Planning decisions should sustain and contribute to compliance with relevant limit values or national objectives for pollutants and opportunities to improve or mitigate should be identified.

National Guidance

- NPPG (Ref. 6-15), with particular reference to paragraph 005 of the Air Quality chapter, which outlines criteria for deciding whether air quality is relevant to a planning application, and paragraph 008 on how air quality can be mitigated.

Local Planning Policy

- Central Lincolnshire Local Plan Policy S14 and S53, which states proposals for renewable schemes will be considered acceptable if the impacts on air quality are acceptable and all development should not result in adverse impacts upon air quality from odour, fumes, dust and other sources (Ref. 6-16);
- Bassetlaw Local Plan Core Strategy and Development Management Policies Policy DM10, which states the council will be supportive of

proposals that seek to use renewable and low carbon energy to minimise CO₂ emissions. Proposals will need to demonstrate that they will not result in unacceptable impacts in terms of pollution (Ref. 6-17); and

- Bassetlaw Local Plan Publication Version 2021 Policy 48 and ST44, which states proposals should not generate a level of air quality or pollution that cannot be mitigated to an appropriate standard and the council will ensure that the current air quality is maintained and where possible improved (Ref. 6-18).

6.3 Assessment Assumptions and Limitations

6.3.1 This chapter forms a preliminary assessment that has been based on available information at the time of preparing this PEI Report. A final assessment will be undertaken as part of the EIA and will be reported in the ES that will be submitted with the DCO submission.

6.3.2 A dust risk assessment has been undertaken on a whole-site basis, assuming site preparation and construction works can be undertaken at any location within the Scheme Boundary. A description of the intended works is included in **PEI Report Volume 1 Chapter 3: Scheme Description**. This provides a worst-case assessment, ensuring that if works are undertaken in a different location than anticipated, then the assessment has covered this potential.

6.3.3 Quantitative modelling of construction phase transport emissions has not been undertaken at this stage, as the details of the Cable Route Corridor have not been fully defined. However, it is estimated that there will be up to 120 AADT of HDV movements per day. This is above the IAQM screening criteria, meaning that a detailed assessment of road traffic emissions during construction will be required at the ES stage.

6.3.4 Quantitative modelling of operational traffic impacts has been scoped out of the assessment. During operation, as set out in **PEI Report Volume I Chapter 15: Transport and Access**, no effects are anticipated due to the low number of vehicle movements anticipated to be required for operation and maintenance. An assessment of operational traffic impacts has been scoped out as agreed in the EIA Scoping Opinion (**PEI Report Volume II Appendix 1-2**).

6.4 Assessment Methodology

Assessment Criteria

6.4.1 There is currently no statutory guidance on the methodology for air quality assessments. Several non-statutory bodies have published their own guidance relating to air quality and development control. This assessment has been undertaken following relevant guidance, including:

- IAQM Guidance on the Assessment of Dust from Demolition and Construction (Ref. 6-1);
- IAQM & EPUK Land-Use Planning & Development Control: Planning for Air Quality (Ref. 6-2); and

- Defra LAQM Technical Guidance (LAQM.TG22) (Ref. 6-23).

Study Area

- 6.4.2 The Study Area includes features likely to be at risk from possible direct and indirect impacts that might arise from the Scheme during construction and decommissioning. The dust risk assessment includes consideration of sensitive receptors within 350m of the Scheme Boundary. In addition, haul routes are considered up to 500m from the site access points for the assessment of trackout (see 6.4.7). The Study Area is in line with IAQM Guidance (Ref. 6-1)

Sensitivity of receptor

- 6.4.3 Sensitive receptors for air quality are generally public exposure receptors (sensitive locations where relevant exposure for the air quality criteria being assessed could occur, e.g. residential properties or schools) and ecological sites sensitive to dust deposition and nitrogen deposition.
- 6.4.4 For the purposes of the dust risk assessment, potentially affected air quality sensitive receptors have been identified for the assessment through a review of Ordnance Survey (OS) mapping and aerial photography.
- 6.4.5 In line with IAQM guidance, the presence of sensitive ecological receptors holding a National or European designation within 50m of the Scheme Boundary, or within 50m from a route used by construction vehicles on the public highway (up to 500m from the Site access points) have been reviewed. There is a designated Ancient Woodland 550m north of the Scheme Boundary, however, in line with IAQM guidance, as this is over 350m from the Scheme Boundary and over 500m from any site access point, this can be scoped out of the dust risk assessment.
- 6.4.6 Based upon guidance for qualitatively assessing the risk of dust impacts from demolition and construction (Ref. 6-1), a number of high sensitivity residential properties have been included in the assessment with regards to construction phase dust soiling and particulate matter less than 10 µg in diameter (PM₁₀) receptors.
- 6.4.7 The access points for the Principal Site are three points along the A631, and another access point on Middle Street. The access points for the Cable Route Corridor are not known at this stage. As the access points for the Cable Route Corridor are currently unknown, this has not been included in the study area. This will be reviewed at the ES stage when more information will be available.

Dust Risk Assessment Methodology

- 6.4.8 A qualitative dust risk assessment has been undertaken to assess the significance of any effects on sensitive receptors associated with the construction phase. The assessment is in accordance with IAQM guidance (Ref. 6-1) and considers potential sources of emissions on the basis of the four main activity groupings:

- Demolition (largely not relevant to the Scheme, as although decommissioning will involve a degree of demolition, it will not involve demolition of large concrete structures);
 - Earthworks (e.g. soil stripping, excavation etc.);
 - Construction; and
 - Trackout (movement of mud and soil out of the site on wheels of construction vehicles).
- 6.4.9 The emphasis within the guidance is on clarifying the risk of dust impacts from the Site, which will allow mitigation measures commensurate with that risk to be identified.
- 6.4.10 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:
- Identification of receptors and their sensitivity;
 - Identify the nature, duration and the location of activities being carried out;
 - Establish the risk of significant effects occurring as a result of these activities (taking into magnitude of effect and receptor sensitivity);
 - Review the proposed or embedded mitigation against good practice;
 - Identify additional mitigation measures, if necessary, to reduce the risk of a significant adverse effect occurring at receptors; and
 - Summarise the overall effect of the works with respect to fugitive emissions of particulate matter and report the significance of the effects.
- 6.4.11 Potential mitigation measures following IAQM guidance are discussed and would be specified in the Framework Construction Environmental Management Plan (CEMP) for the Scheme (**PEI Report Volume II Appendix 3-1**).

Emissions of Non-Road Mobile Machinery

- 6.4.12 Emissions from construction Non-Road Mobile Machinery (NRMM) will have the potential to increase NO₂ and PM₁₀ concentrations locally when in use during construction. IAQM guidance states that:

Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or 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. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur. ... The impacts of exhaust emissions from on-site plant and site traffic are not considered further in this Guidance.

- 6.4.13 This suggests that NRMM are unlikely to make a significant impact on local air quality, and will not need to be quantitatively assessed. Emissions from NRMM are controlled through EU legislation, and further controlled on-site

through best-practice mitigation measures. For that reason, construction phase NRMM emissions would not be significant and, therefore, these emissions have not been modelled nor are required to be considered any further in this assessment.

Assessment of Construction Phase Road Traffic Emissions

6.4.14 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. IAQM/EPUK (Ref. 6-2) set out criteria to establish the need for an air quality assessment not located within an air quality management area as being:

“More than 500 AADT total, or more than 100 AADT of HDV.”

6.4.15 At this PEI Report stage, it is anticipated that as a worst case during the peak construction period, there could be up to a peak of 120 AADT of HDV (see **PEI Report Volume I Chapter 15: Transport and Access**). This is above the IAQM threshold and as such impacts from vehicle emissions will need to be assessed in detail at the ES stage, when more details are known about the traffic movements.

Sources of Information

Desktop Survey

6.4.16 Sources of information consulted include:

- Scheme Boundary as shown in **PEI Report Volume III Figure 2-1**;
- Review of Defra Air Quality Background Concentration Maps (Ref. 6-20); and
- Examination of Local Authority Review and Assessment Reports (Ref. 6-21 and Ref. 6-22).

Field Survey

6.4.17 A three-month nitrogen dioxide (NO₂) diffusion tube monitoring survey was undertaken at nine roadside sites (**PEI Report Volume III Figure 6-1**) in the vicinity of the Principal Site in 2022. The monitoring results of this survey are presented in Table 6-2. The monitoring results are presented in this chapter to establish baseline pollutant concentrations. However, it should be noted, locations have been selected on the basis of their suitability for model verification if dispersion modelling of construction phase traffic is required at ES stage rather than to consider public exposure.

6.5 Stakeholder Engagement

6.5.1 A request for an EIA Scoping Opinion was sought from the Secretary of State through the Planning Inspectorate in 2022 as part of the EIA Scoping Process. Responses in relation to air quality, to date, are presented in Table 6-1.

Table 6-1: Engagement Undertaken

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
Planning Inspectorate	The Applicant proposes to scope out an assessment of plant related emissions on the basis that the scale of construction required and number of plant vehicles means that the anticipated emissions would represent a small source relative to ambient local conditions. However, a qualitative construction phase dust assessment and a CEMP taking account of Institute of Air Quality Management (IAQM) guidance are proposed.	The PEI Report has included a qualitative dust risk assessment following IAQM Guidance and set out proposed mitigation measures to be considered in a CEMP for a high-risk site.	Dust Risk Assessment in Section 6.8. Mitigation in Section 6.9.
Planning Inspectorate	Paragraph 3.58 of the Scoping Report states that at this stage of the application process, the anticipated peak construction period will give rise to 64 to 66 Heavy Goods Vehicle (HGV) deliveries per day as a worst case based on a 24-month construction period. On the basis that the predicted HGV movements of the project alone do not exceed the 200 HGV per day thresholds set out in guidance, the Inspectorate is content to scope this matter out from further quantitative assessment. The ES must provide up to date information on the anticipated construction programme and the predicted number of HGV movements to confirm that the thresholds are not exceeded. In light of other proposed developments within the area, the ES must also demonstrate that the thresholds for further assessment are not exceeded cumulatively on relevant links.	At this stage, as detailed traffic data is not currently available, a quantitative assessment of construction traffic has not been conducted but will be considered in the ES once information on the programme and traffic volumes are known. This is in line with the Scoping Report. Current estimates of construction traffic movements are above the IAQM screening threshold, and therefore detailed assessment will be required.	To be considered within the ES.
Planning Inspectorate	The Applicant proposes to scope out air quality impacts associated with the operational phase on	Operational traffic generated by the scheme	Section 6.4.

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
	<p>the basis that traffic movements would be minimal, limited to maintenance activities and infrequent heavier traffic movements associated with repairs or replacements of infrastructure.</p> <p>Minimal traffic movements are anticipated during operation.</p> <p>Paragraph 3.64 of the Scoping Report states that there would be a maximum of 10 to 12 staff on-site daily for monitoring, maintenance, and servicing activities during the operational phase and an average of 10 to 20 visits per year with four-wheel drive vehicles, HGVs, or transit vans for maintenance.</p> <p>Based on the characteristics of the operational phase of the Proposed Development the Inspectorate is content that minimal traffic movements would occur during operation. The ES must however provide information on the cumulative nature of traffic movements during the operational phases and confirm these projections fall below the relevant thresholds set out in guidance. On this basis, the Inspectorate is content to scope this matter out.</p>	<p>is negligible. Therefore, all other similar solar developments are assumed to also have a negligible operational impact on air quality, and therefore no potential to generate a significant cumulative effect. In addition, were other developments found to have a significant impact, the negligible impact of this Scheme would not increase the significance of effect of the other schemes as this Scheme is such a small contribution.</p>	
<p>Planning Inspectorate</p>	<p>The ES should be accompanied by a plan showing the location of sensitive air quality receptors within the vicinity of the Proposed Development to aid understanding of the extent of effects.</p>	<p>The figures at this stage show the monitoring sites around the Study Area and dust risk assessment zones. As detailed dispersion modelling is not being undertaken until the ES stage, representative</p>	<p>To be considered within the ES.</p>

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
		sensitive receptors have not yet been selected. Figures to accompany this detailed assessment will be provided at the ES stage.	
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). Paragraph 7.26 confirms that in the absence of monitoring near the scheme and in accordance with the Local Air Quality Management (LAQM) Technical Guidance, nitrogen dioxide diffusion tubes are currently being undertaken in the vicinity of the Proposed Development for a period of three months in order to verify the model. Effort should be made to reach agreement with the local authorities as to the location and number of the diffusion tubes. Agreement must also be sought with these bodies as to whether any further monitoring is required to provide a baseline for other pollutants.	A 3 month monitoring study has been conducted to inform the baseline and to be used for construction traffic modelling for the ES if required.	Section 6.6.
Planning Inspectorate	The Inspectorate notes that there is potential for air quality impacts on designated nature conservation sites (as noted in paragraph 10.34 of the Scoping Report). Baseline information from the Air Pollution Information System (APIS) may also be of relevance to the assessment.	The nearest ecological site (an ancient woodland) is more than 500m from the Scheme Boundary of access point and has been scoped out from assessment at this stage.	Section 6.4.

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
Planning Inspectorate	<p>Paragraph 7.36 of the Scoping Report states that ecological sites, apart from some areas of ancient woodland, are not considered sensitive receptors due to their distance from the Proposed Development. However, paragraph 10.34 of the Scoping Report lists degradation due to dust deposition as a potential impact on ecological sites. As such there is inconsistency across the different chapters of the Scoping Report and it is unclear whether air quality impacts on ecological receptors will be assessed.</p> <p>For the avoidance of doubt, the ES should assess the potential for likely significant effects relating to air quality on ecological receptors. The Applicant should seek agreement on the sensitive receptors from relevant consultation bodies.</p>	<p>The reference in paragraph 7.36 of the EIA Scoping Report was to ecological sites in the specific context of IAQM guidance on dust risk assessments. The reference in paragraph 10.34 was a general reference to potential impacts on habitat features.</p>	Section 6.4.

6.6 Baseline Conditions

Existing Baseline

Principal Site

- 6.6.1 There are no Air Quality Management Areas (AQMAs) declared in West Lindsey District Council or Bassetlaw District Council. Concentrations of NO₂ and PM₁₀ are considered to meet the UK objectives across the districts, which is rural with no large conurbations.
- 6.6.2 West Lindsey District Council undertakes routine ongoing monitoring of NO₂ as part of their LAQM responsibilities under Part IV of the Environment Act (2021) (Ref. 6-21) at 12 locations in the District. All monitoring sites have recorded concentrations below the annual mean objective value of 40 micrograms per cubic metre (µg/m³) since monitoring began (Ref. 6-21). These monitoring locations are all in Gainsborough (approximately 5km west of the Scheme) and Market Rasen (approximately 15km east of the site).
- 6.6.3 Bassetlaw District Council also conducts routine monitoring of NO₂ via a network of 23 diffusion tube monitoring sites as part of their LAQM responsibilities (Ref. 6-22). All monitoring sites have recorded concentrations below the annual mean NO₂ objective from 2015 to 2019, with no data currently available on the Council's website after this date. Bassetlaw's monitoring locations are primarily in Worksop, Retford, Harworth and Tuxford. The nearest monitoring location is approximately 4km south of the Cable Route Corridor, and 15km southwest of the Principal Site.
- 6.6.4 A three-month NO₂ diffusion tube monitoring survey was undertaken at 9 roadside sites in the vicinity of the Scheme in 2022. The location of these monitoring locations are presented in **PEI Report Volume III Figure 6-1**. These short-term monitoring results have been adjusted following guidance in LAQM.TG (Ref. 6-23) to produce annual mean 2021 equivalent concentration as presented in Table 6-2. Results are presented here to establish baseline pollutant concentrations. However, it should be noted, locations have been selected on the basis of their suitability for model verification if dispersion modelling of construction phase traffic is required at ES stage, rather than to consider public exposure.

Table 6-2: AECOM Measured Annual Mean NO₂ Concentrations

Site ID	OS Grid Ref X, Y	Site Type	Annualised 2021 Mean NO ₂ Concentration (µg/m ³)
M1	487343, 391006	Roadside	18.4
M2	489368, 390795	Roadside	10.5
M3	493782, 389990	Roadside	16.3
M4	496686, 389530	Roadside	29.5
A14	493993, 387583	Roadside	9.3
A15	494979, 388229	Roadside	20.7
A16	495330, 387363	Roadside	11.8
A17	495233, 385868	Roadside	9.0
A18	495604, 384842	Roadside	12.3

6.6.5 Annual mean NO₂ concentrations for 2021 at monitoring sites within the vicinity of the Scheme are all below the annual mean NO₂ objective of 40 µg/m³. Concentrations range from 9.0 µg/m³ to 29.5 µg/m³. The highest annual mean NO₂ concentration was recorded at M4, located near the Caenby Corner roundabout, approximately 2.5 km east of the Scheme Boundary.

Background Pollutant Concentrations

6.6.6 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 (e.g. 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 good understanding of local pollutant sources.

6.6.7 Background data for the relevant 1 km x 1 km grid squares (related to the Study Area) has been sourced from Defra Background Maps for 2021. Concentrations are below the relevant air quality objectives across all grid squares which encompass the Scheme, as shown in Table 6-3.

Table 6-3: Defra Mapped Background Pollutant Concentrations for 2021

OS Grid Ref X, Y	Annual Mean Concentration (µg/m ³)			
	NO ₂	NO _x	PM ₁₀	PM _{2.5}
488500, 390500	7.2	9.2	15.6	8.4
489500, 390500	7.1	9.1	15.6	8.4
490500, 390500	7.2	9.3	15.6	8.5
491500, 390500	7.2	9.3	15.6	8.5
488500, 389500	6.8	8.7	15.4	8.4

OS Grid Ref X, Y	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			
	NO ₂	NO _x	PM ₁₀	PM _{2.5}
489500, 389500	6.8	8.6	15.4	8.4
490500, 389500	6.9	8.8	15.5	8.4
491500, 389500	6.9	8.8	15.5	8.4
488500, 388500	6.8	8.7	15.4	8.4
489500, 388500	6.7	8.6	15.4	8.4
490500, 388500	6.9	8.8	15.5	8.4
491500, 388500	6.8	8.7	15.5	8.4
488500, 387500	6.8	8.7	15.4	8.4
489500, 387500	6.7	8.6	15.4	8.4
490500, 387500	6.8	8.8	15.5	8.4
491500, 387500	6.8	8.7	15.5	8.4
488500, 386500	6.8	8.7	15.4	8.4
489500, 386500	6.7	8.6	15.4	8.4
490500, 386500	6.9	8.8	15.5	8.4
491500, 386500	6.8	8.7	15.5	8.4
Average:	6.9	8.8	15.5	8.4

Baseline Dust Climate

- 6.6.8 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.
- 6.6.9 This baseline rate of soiling is considered normal (based on professional judgement and current background levels) and varies dependent on prevailing climatic conditions. The tolerance of individuals to deposited dust is therefore shaped by their experience of baseline conditions.
- 6.6.10 Existing local sources of particulate matter includes wind-blown dust from 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

- 6.6.11 In the future, based on projections, it is anticipated the future local air quality will improve as emissions continue to decline due to improvements in the vehicle fleet and a reduction in background pollution levels. Future projections by Defra for the construction year 2027 are in Table 6-4 which shows all pollutants are expected to be below relevant objectives.

Table 6-4: Defra Mapped Background Pollutant Concentrations for 2027

OS Grid Ref X, Y	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			
	NO ₂	NO _x	PM ₁₀	PM _{2.5}
488500, 390500	6.2	7.8	15.0	8.0
489500, 390500	6.1	7.8	15.0	7.9
490500, 390500	6.2	7.9	15.0	8.0
491500, 390500	6.2	7.9	15.0	8.0
488500, 389500	6.0	7.6	14.9	7.9
489500, 389500	5.9	7.5	14.8	7.9
490500, 389500	6.0	7.6	14.9	7.9
491500, 389500	6.0	7.6	14.9	7.9
488500, 388500	5.9	7.5	14.8	7.9
489500, 388500	5.9	7.4	14.8	7.9
490500, 388500	6.0	7.6	14.9	7.9
491500, 388500	6.0	7.6	14.9	7.9
488500, 387500	5.9	7.5	14.8	7.9
489500, 387500	5.9	7.4	14.8	7.9
490500, 387500	6.0	7.6	14.9	7.9
491500, 387500	6.0	7.6	14.9	7.9
488500, 386500	5.9	7.5	14.8	7.9
489500, 386500	5.9	7.5	14.8	7.9
490500, 386500	6.0	7.6	14.9	7.9
491500, 386500	6.0	7.6	14.9	7.9
Average:	6.0	7.6	14.9	7.9

6.7 Embedded Design Mitigation

- 6.7.1 This section contains the mitigation measures relevant to this chapter that are already incorporated into the Scheme design, as described in **PEI Report Volume I Chapter 3: Scheme Description**. It forms part of the Framework Construction Environmental Management Plan (CEMP) (**PEI Report Volume II Appendix 3-1**).
- 6.7.2 Mitigation measures appropriate to the assessed level of risk of dust nuisance (high, see section 6.8) will be implemented. Recommended measures are set out below in Table 6-5 and Table 6-6, and will be refined and included within the Framework CEMP. These are considered to be embedded mitigation, as they are required in order to ensure no off-site impacts from dust.

6.7.3 Mitigation may be required for road traffic emissions during construction, but detailed modelling has not been undertaken at this stage and will be done at the ES stage.

Table 6-5: Mitigation for a High-Risk Site (from IAQM)

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 Scheme. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Site Management	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real-time PM ₁₀ continuous monitoring and/or visual inspections.
	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- or offsite, and the action taken to resolve the situation in the logbook.
	Hold regular liaison meetings with other high-risk construction sites within 500m of the Scheme (or greater, 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.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of Scheme, with cleaning to be provided if necessary.
	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.
	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.

Activity	Mitigation Measure
	<p>Agree approach to monitoring with the Local Authority ahead of construction commencing. Data will be collected before any work commences on-site to provide a comparative baseline should real-time airborne particulate or dust deposition monitoring be required.</p>
<p>Preparing and Maintaining the Site</p>	<p>Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.</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 100m 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>Operating vehicle/machinery and sustainable travel*</p>	<p>Remove materials that have a potential to produce dust from the Scheme as soon as possible, unless being re-used on-site. If they are being re-used on-site cover as described below</p>
	<p>Ensure all vehicles switch off engines when stationary - no idling vehicles.</p>
	<p>Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.</p>
	<p>Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads 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).</p>
<p>Operations</p>	<p>Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.</p>
	<p>Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).</p>
	<p>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.</p>
<p>Waste Management</p>	<p>Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.</p>
<p>Waste Management</p>	<p>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.</p>
<p>Waste Management</p>	<p>Avoid bonfires and burning of waste materials.</p>

Table 6-6: 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 possible
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery.
Construction	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.
	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.
Trackout	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport
	Inspect on-site haul routes 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.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10 m from receptors where possible.

6.8 Assessment of Likely Impacts and Effects

6.8.1 The Scheme as outlined in **PEI Report Volume I Chapter 3: Scheme Description** has been considered in assessing the likely impacts and effects of the Scheme, whilst considering the embedded mitigation described in the previous section.

Construction (2025 to 2027)

Dust Risk Assessment

- 6.8.2 The dust risk assessment considers the potential dust emissions magnitude at each stage of the works in conjunction with the sensitivity of the surrounding area. Based on these parameters, the site is classified as low, medium or high risk, and mitigation measures corresponding to the perceived level of risk can then be proposed.
- 6.8.3 The assessment considers the potential dust risk across a set of pre-defined zones, up to 350m from the Scheme. These zones are presented in **PEI Report Volume III Figure 6-2**.
- 6.8.4 The dust risk assessment is provided in **PEI Report Volume II Appendix 6-1**.
- 6.8.5 The dust risk assessment has been undertaken based on construction activities, however, the overall dust risk assessment conclusions are likely to be applicable to decommissioning as well. A dust risk assessment would need to be undertaken at the time of decommissioning.

Demolition

- 6.8.6 The Scheme will not require any demolition during the construction phase. Demolition has therefore been scoped out and will not be considered further within this assessment. Demolition will be required during decommissioning. However, due to the timescale of when this will occur, it is likely that guidance will have changed in the intervening years, and a dust risk assessment will be required prior to the decommissioning works based on current guidance. The overall risk rating for the site takes into account all four activity categories on a worst-case basis, and therefore at this stage the overall risk rating is considered to apply to the decommissioning phase as well as the construction phase.

Earthworks

- 6.8.7 The Scheme Boundary covers an area greater than 10,000 m². This is greater than the threshold set out in IAQM Guidance (Ref. 6-1) and therefore the potential dust emissions magnitude associated with earthworks is considered to be large.
- 6.8.8 The sensitivity of the area to dust soiling during the earthworks phase is **high** due to the proximity of sensitive receptors, therefore, the risk of dust impact for earthworks activities is classified as **high risk** to dust soiling.
- 6.8.9 The sensitivity of the area is **low** for human health impacts due to low background particulate matter concentrations. Therefore, the risk of dust impact for earthworks activities is classified as a **low risk** to human health.

Construction

- 6.8.10 The Scheme Boundary covers an area greater than 100,000 m² and therefore the potential dust emissions magnitude for construction activities is expected to be large.

6.8.11 The sensitivity of the area to dust soiling is **high** due to the proximity of sensitive receptors, therefore the risk of dust impact during construction is classified as **high risk** to dust soiling.

6.8.12 The sensitivity of the area to human health impacts is **low**. Therefore, the risk of dust impact during construction is classified as **low risk** to human health.

Trackout

6.8.13 The number of construction related heavy duty vehicle (HDV) movements generated by the Scheme is estimated to exceed 50 vehicles per day during the peak of the construction (as set out in IAQM Guidance (Ref. 6-1)). Considering the size of the Scheme, and the soil type, the potential dust emissions magnitude for trackout is assumed to be large.

6.8.14 The sensitivity of the area to dust soiling is **high**, therefore the risk of dust impact due to trackout is **high risk** to dust soiling.

6.8.15 The sensitivity of the area to human health is **low**. Therefore, the risk of dust impacts due to trackout is **low risk** to human health.

6.8.16 A summary of the magnitude of emissions is presented in Table 6-7.

Table 6-7: Summary of Potential Dust Emission Magnitudes for Construction Activities

Activity	Potential Dust Emission Magnitude
Demolition	N/A
Earthworks	Large
Construction	Large
Trackout	Large

6.8.17 The sensitivity of receptors is shown in Table 6-8.

Table 6-8: Summary of Area Sensitivity to Construction Phase Activities

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High	High	High
Human Health (PM ₁₀ effects)	N/A	Low	Low	Low
Ecology	N/A	N/A	N/A	N/A

6.8.18 The overall risk of dust effect is provided in Table 6-9. The risk of dust soiling is **high**, and the risk of human health effects is **low**. As such mitigation measures for a **high risk** site will be implemented. With the implementation of the recommended level of mitigation, the overall significance of effect will be **negligible to minor adverse (not significant)**.

Table 6-9: Summary of Risk of Dust Effects for Construction Phase Activities on Human Receptors without Mitigation

Potential Impact	Summary of Dust Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High	High	High
Human Health (PM ₁₀ effects)	N/A	Low	Low	Low
Ecology	N/A	N/A	N/A	N/A

Construction Phase Traffic Assessment

6.8.19 Available information suggests that impacts from road traffic emissions during construction will be above the IAQM thresholds. A detailed assessment will be undertaken at the ES stage.

Operation

6.8.20 Operational impacts due to the Scheme are scoped out as agreed in the EIA Scoping Opinion (**PEI Report Volume II Appendix 1-2**).

6.8.21 The Scheme is expected to support 10 to 12 staff on-site during the operational phase. In addition, it is anticipated that there could be an average of 10 to 20 visits per year with four-wheel drive vehicles, HGVs or transit vans for maintenance. Traffic generation from operational staff is not expected to induce significant changes to traffic flows on the local road network. There are no significant sources of NO₂ or PM₁₀ onsite.

6.8.22 The operation of the Scheme is not anticipated to have a significant impact on local air quality. The effect on air quality during this phase will therefore be **not significant**.

Decommissioning

6.8.23 Decommissioning is assumed to generate similar effects to those anticipated during the construction phase, and therefore the mitigation measures proposed for implementation during the construction phase will be appropriate for application to decommissioning.

6.8.24 Decommissioning is expected to be shorter in duration, less intensive and with fewer road trips. Thus this represents the worst case.

6.8.25 Impacts on local air quality as a result of dust generation from decommissioning will be short-term and temporary. Effects are considered to be **not significant**.

6.9 Additional Mitigation and Enhancements

Additional Mitigation

6.9.1 No mitigation over and above that already set out in this assessment will be required for air quality.

6.10 Residual Effects

- 6.10.1 This section summarises the residual effects of the Scheme on air quality following the implementation of embedded and additional mitigation.
- 6.10.2 The dust assessment has identified the potential for high risk associated with dust deposition, and low risk to human health. Following implementation of the CEMP, which will incorporate the mitigation measures outlined above, the effect on dust deposition and human health is anticipated to be **not significant**.
- 6.10.3 An assessment of the effect of road traffic emissions on local air quality during construction will be included in the ES. However, at this stage, given the relatively good air quality baseline conditions in the Study Area, it is not expected that the additional road traffic will lead to any exceedances of the national air quality strategy objectives.

Table 10: Residual Effects (Air Quality)

Description of Effect (on receptor)	Sensitivity (of Receptor)	Nature of Effect	Magnitude of Impact	Environmental Management	Design and	Classification of Effect	Further Monitoring	Mitigation	and Residual Effect
Demolition and Construction									
Dust effects on residential properties.	High	Temporary, short term	High	Dust management set out in the CEMP.	measures	Negligible	Not applicable	Negligible Not significant	

6.11 Cumulative Effects

6.11.1 An assessment of cumulative effects is provided in **PEI Report Volume I Chapter 17: Cumulative Effects**.

6.12 References

- Ref. 6-1. IAQM (2014). Guidance on the assessment of dust from demolition and construction. Institute of Air Quality Management.
- Ref. 6-2. IAQM (2017). Land-Use Planning & Development Control: Planning For Air Quality. Institute of Air Quality Management.
- Ref. 6-3. HMSO (2021). Environment Act 2021. Available at <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Ref. 6-4. HMSO (1995). Environment Act 1995. Available at <https://www.legislation.gov.uk/ukpga/1995/25/contents>
- Ref. 6-5. HMSO (2019). Clean Air Strategy. DEFRA. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
- Ref. 6-6. HMSO (2018). 25 Year Environment Plan. Available at <https://www.gov.uk/government/publications/25-year-environment-plan>
- Ref. 6-7. HMSO (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. 6-8. HMSO (2019). Clean Air Strategy. DEFRA. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
- Ref. 6-9. HMSO (2010) The Air Quality Standards Regulations 2010. Available at: <https://www.legislation.gov.uk/uksi/2010/1001/>
- Ref. 6-10. HMSO (2016) The Air Quality Standards (Amendment) Regulations 2016. Available at: <https://www.legislation.gov.uk/uksi/2016/1184/regulation/1/made>
- Ref. 6-11. HMSO (2011). Overarching NPS for Energy (EN-1). Department for Energy and Climate Change (DECC) Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf
- Ref. 6-12. Department for Energy Security and Net Zero (2023). Draft Overarching National Policy Statement for Energy (EN-1)
- Ref. 6-13. Department for Energy Security and Net Zero (2023). Draft National Policy Statement for Renewable Energy (EN-3)
- Ref. 6-14. HMSO (2021). NPPF 2021. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf
- Ref. 6-15. HMSO (2014) Planning Practice Guidance (PPG) 2014 – Air Quality. Available at <https://www.gov.uk/guidance/air-quality--3>
- Ref. 6-16. Central Lincolnshire Joint Strategic Planning Committee (2023), Central Lincolnshire Local Plan

- Ref. 6-17. Bassetlaw District Council Local Plan 2021, and Addendum 2022. Available at: <https://www.bassetlaw.gov.uk/planning-and-building/the-draft-bassetlaw-local-plan/>
- Ref. 6-18. Bassetlaw District Council, (2022), Publication Draft Bassetlaw Local Plan.
- Ref. 6-19. HMSO (2020). The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. Available at <https://www.legislation.gov.uk/ukxi/2020/1313/contents/made>
- Ref. 6-20. DEFRA (2020). DEFRA Air quality Background Concentration Maps 2018. Available at <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/background-maps/#:~:text=Air%20pollution%20background%20concentration%20maps,under%20the%20Environmental%20Act%201995>
- Ref. 6-21. WLDC, (2022). West Lindsey District Council 2022 Annual Progress Report. Available at <https://www.west-lindsey.gov.uk/sites/default/files/2022-06/Air%20Quality%20Report%202022.pdf>
- Ref. 6-22. Bassetlaw District Council (2019), 2020 Air Quality Annual Status Report (ASR). Available at: <https://data.bassetlaw.gov.uk/air-quality-management.aspx>
- Ref. 6-23. Defra, (2022), Local Air Quality Management Technical Guidance (TG22), August 2022. Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>