

**The Great Grid Upgrade**

Chesterfield to Willington

# Preliminary Environmental Information Report

Volume 1: Chapter 13 Air Quality

March 2026

nationalgrid

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# 13. Air Quality

## 13.1 Overview

13.1.1 This chapter reports the preliminary assessment of the likely significant air quality effects that could result from the Chesterfield to Willington Project ('the Project') during construction and operation, and describes:

- relevant legislation and planning policy context;
- consultation and engagement undertaken to date;
- the methodology for assessment;
- relevant baseline information;
- potential effects of the construction phase;
- potential effects of the operational phase;
- potential additional mitigation measures; and
- residual effects.

13.1.2 This chapter covers effects on the following receptors during construction and operation:

- Human sensitive receptors, including locations where annual mean Air Quality Objectives (AQOs) apply, such as residential properties, schools, care homes and hospitals.
- Short-term objectives apply at locations where people may be reasonably expected to spend a period of time equivalent to the objective, e.g., hotels in the case of the daily mean objective for particulate matter (PM<sub>10</sub>), and outdoor seating areas, publicly accessible areas, e.g., footpaths, and the gardens of residential properties in the case of the hourly mean objective for nitrogen dioxide (NO<sub>2</sub>).
- Ecological sensitive receptors such as habitats supporting sensitive species, e.g., lichens, bryophytes, dust-sensitive flora and fauna, species on the Red Data List for Great Britain, and/or habitats with critical loads/levels for pollutants, which include:
  - statutory designated sites which, for this preliminary assessment, only consist of Sites of Special Scientific Interest (SSSIs) and Local Nature Reserves (LNRs); and
  - non-statutory designated sites which, for this preliminary assessment, only consist of Local Wildlife Sites (LWSs) and ancient woodlands.

13.1.3 This chapter should be read in conjunction with:

- **Chapter 4 Description of the Project;**
- **Chapter 5 Approach to Preliminary Environmental Information Report;**
- **Chapter 7 Ecology and Biodiversity.** This chapter assesses the potential for changes in air quality to affect ecological receptors, such as increases in pollutant concentrations or dust deposition;

- **Chapter 9 Hydrology and Land Drainage.** This chapter assesses the potential changes in the water environmental including flood risk and water quality;
  - **Chapter 12 Traffic and Transport.** This chapter assesses the potential change in traffic movements during construction and operation, which are relevant to the assessment of air quality effects associated with vehicle emissions;
  - **Chapter 15 Socio-economics, Recreation and Tourism.** This chapter assesses potential effects upon local businesses and recreational areas that could be affected by the Project, including changes in air quality acting in combination with other impacts to result in effects upon amenity;
  - **Chapter 16 Health and Wellbeing.** This chapter assesses the potential effects of the Project upon health and wellbeing, including changes in air quality; and
- Chapter 17 Cumulative Effects.** This chapter includes both the intra- and inter-project cumulative effect interactions on air quality, with other topic areas and other committed schemes.

13.1.4 This chapter is supported by the following figures in **Volume 2**. These include:

- **Figure 13.1 Baseline Air Quality and Constraints;**
- **Figure 13.2 Construction Dust Study Area;** and
- **Figure 13.3 Preliminary Affected Road Network.**

## 13.2 Legislation, Planning Policy and Guidance Context

### Legislation

13.2.1 The overarching legislation and local and national policy that has informed the PEIR is outlined in **Chapter 2 Legislative, Regulatory and Planning Policy Context**. A summary of the key legislation considered in the scope of effects on air quality is outlined below:

- Environmental Protection Act 1990 (Ref 13.1);
- Environment Act 1995 (Ref 13.2);
- The Air Quality (England) Regulations 2000 (Ref 13.3), amended in 2002 (Ref 13.4);
- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe Ref 13.5);
- The Air Quality Standards Regulations 2010 (Ref 13.6) as amended in 2016 (Ref 13.7);
- The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (Ref 13.8);
- The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (Ref 13.9);
- Environment Act 2021 (Ref 13.10); and
- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref 13.11).

13.2.2 The relevant ambient Air Quality Standards (AQSs) for the protection of human health, included in the above legislation, are set out in **Table 13.1**.

**Table 13.1: Relevant AQSs for the protection of human health**

| Standard   | Concentration (µg/m <sup>3</sup> ) | Permissible Exceedances Per Calendar Year | Set in Regulations As     |
|--|------------------------------------|---|---------------------------|
| <b>Air Quality Standards Regulations 2010 (Ref 13.6)</b>                                       |                                    |   |                           |
| Annual mean nitrogen dioxide (NO <sub>2</sub> )  | 40                                 | None                                      | Objective and limit value |
| 1-hour mean NO <sub>2</sub>  | 200                                | No more than 18                           | Objective and limit value |
| Annual mean PM <sub>10</sub> (coarse particulate matter, less than 10 micrometres in diameter) | 40                                 | None                                      | Objective and limit value |
| 24-hour mean PM <sub>10</sub>  | 50                                 | No more than 35                           | Objective and limit value |
| Annual mean PM <sub>2.5</sub> (fine particulate matter, less than 2.5 micrometres in diameter) | 20*                                | None                                      | Limit value               |
| <b>Environmental Improvement Plan 2023 (Ref 13.27)</b>   |                                    |   |                           |
| Annual mean PM <sub>2.5</sub>  | 12                                 | None                                      | Interim target for 2028   |
| <b>Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref 13.11)</b>  |                                    |   |                           |
| Annual mean PM <sub>2.5</sub>  | 10                                 | None                                      | Target for 2040           |

Note:

\* As amended through the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 (Table 13.9).

13.2.3 The Air Quality (England) Regulations 2000 (Ref 13.3) state that these standards ‘shall be determined by reference to the quality of air at locations–

(a) which are situated outside of buildings or other natural or man-made structures above or below ground; and

(b) where members of the public are regularly present.’

13.2.4 Box 1-1 in the Department for Environment, Food, and Rural Affairs (Defra) Local Air Quality Management Technical Guidance LAQM TG(22) (Ref 13.13) provides examples of where the ambient AQS for the protection of human health apply. These are given in **Table 13.2**.

**Table 13.2: Examples of where the ambient AQSs for the protection of human health apply**

| Averaging Period | Locations Where Objectives Should Apply  | Locations where Objectives Should Not Apply  |
|------------------|--|--|
| Annual Mean      | All locations where members of the public might be regularly exposed.<br>Building façades of residential properties, schools, hospitals, care homes, etc.  | Building façades of offices or other places of work where members of the public do not have regular access.<br>Hotels, unless people live there as their permanent residence.<br>Gardens of residential properties.<br>Kerbside sites (as opposed to locations at the building façade) or any other location where public exposure is expected to be short term. |
| 24-hour mean     | All locations where the annual mean objective will apply, together with hotels and gardens of residential properties.  | Kerbside sites (as opposed to locations at the building façade) or any other location where public exposure is expected to be short term.  |
| 1-hour mean      | All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (e.g., pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where people may reasonably be expected to spend one hour or more.<br>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer. | Kerbside sites where the public will not be expected to have regular access.   |

13.2.5 Some ecologically designated sites may also include features that are sensitive to changes in air quality, specifically levels of oxides of nitrogen (NO<sub>x</sub>) and ammonia (NH<sub>3</sub>) in ambient air. When considering the effects of airborne pollutants on ecologically sensitive receptors, the relevant standards are referred to as ‘critical levels’. Standards based on the air quality regulations (detailed above) have been established for concentrations of several gaseous airborne pollutants including NO<sub>x</sub>. For NH<sub>3</sub>, the relevant standards are based on values adopted from the Working Group on Effects of the United Nations Economic Commission for Europe Convention on Long Range Transboundary Air Pollution (Ref 13.13). These standards are summarised in **Table 13.3**.

**Table 13.3: Relevant critical levels for the protection of vegetation and ecosystems**

| Pollutant       | Concentration ( $\mu\text{g}/\text{m}^3$ ) | Averaging Period | Set in Regulations as:                          |
|-----------------|--|------------------|---|
| NO <sub>x</sub> | 30   | Annual mean      | Critical level for the protection of vegetation |
| NO <sub>x</sub> | 75   | Daily mean       | Critical level for the protection of vegetation |
| NH <sub>3</sub> | 1 (for lichens and bryophytes)             | Annual mean      | Not applicable                                  |
| NH <sub>3</sub> | 3  | Annual mean      | Not applicable                                  |

13.2.6 In addition, vegetation can be affected by the deposition of pollutants and particles on the ground and vegetative surface, e.g., leaf surface. Close to roads, the key concern for sensitive sites is likely to be the deposition of nitrogen, which can result in a variety of effects depending on the habitats present (e.g., interfering with photosynthesis, increasing acidification, altering species composition, etc.). In relation to deposition, the relevant assessment benchmarks are referred to as ‘critical loads’, which are defined as:

*‘...a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge’ (Ref 13.14).*

13.2.7 In the UK, critical loads have been established for a wide range of habitat and vegetation types, reflecting the variation in ecosystem responses; these are available from the Air Pollution Information System (APIS) (Ref 13.15). For nitrogen, the critical loads are typically expressed as kilograms of nitrogen per hectare per year (kg N/ha/yr). Further details on the critical loads relevant to this assessment are provided in **Table 13.18**.

13.2.8 While the assessment of air quality impacts on sensitive ecological receptors has not been undertaken as part of this assessment, where screening indicates that this should be considered at the Environmental Statement (ES) stage, the potential for likely significant effects will be determined as outlined in section 13.4.45.

## National Planning Policy

### National Policy Statements (NPSs)

13.2.9 **Chapter 2 Legislative, Regulatory and Planning Policy Context** sets out the overarching policy relevant to the Project including the Overarching National Policy Statement for Energy (EN-1) (Ref 13.16) and the National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 13.17). **Table 13.4** sets out the NPSs relevant to air quality and how these have been considered within this chapter<sup>1</sup>.

<sup>1</sup> The updated NPSs came into force on 6 January 2026; however, this post-dated the drafting and assessment work within this chapter and so are not reflected within the relevant policy descriptions in this chapter, which are instead based on the 2023 versions of the NPSs that were in force at the time of preparing the Chapter. These sections will be updated in the ES as part of the Application; however, after initial review and consideration, it is not anticipated that the updates to the NPS will result in any material changes to the assessment methodology or the conclusions in this chapter.

**Table 13.4: National Policy Statements relevant to air quality**

| Policy Reference   | Policy Context   | How it will be considered   |
|--|--|---|
| <b>Overarching National Policy Statement for Energy (EN-1)</b> |  |   |
| <b>5.2 Air Quality and Emissions</b>                           |  |   |
| Paragraph 5.2.1 (part)   | <i>‘Energy infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats, or on the wider countryside and species’.</i>   | <p>The air quality assessment has considered the impacts and resulting effects on sensitive human and ecological receptors, associated with construction phase, as described in section 13.7, and will be rescreened as part of the ES.</p> <p>While detailed information on operational phase vehicle movements is not currently available, based on projects of a similar type and scale, they are not anticipated to lead to a significant effect on air quality; this will be confirmed at the ES stage through screening of the predicted vehicle movements. Impacts associated with decommissioning have been scoped out of the ES.</p> |
| Paragraph 5.2.2  | <i>‘Legal limits for pollutants in ambient air are set out in the Air Quality Standards Regulations 2010 and for England, national objectives set out in the Air Quality (England) Regulations 2000 reiterated in the Air Quality Strategy [...] In addition, two fine particulate matter (PM<sub>2.5</sub>) targets were set under the Environment Act 2021 for England – an annual mean concentration target and a population exposure target. Internationally agreed emissions commitments are set in The National Emission Ceilings Regulations 2018 and establish limits for total UK emissions of key pollutants’.</i> | <p>Project effects have been evaluated in the context of the Limit Values (LV), as set out in The Air Quality Standards Regulations 2010 (Ref 13.6) and The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Ref 13.11).</p>   |

| Policy Reference | Policy Context  | How it will be considered   |
|------------------|---|---|
| Paragraph 5.2.3  | <i>‘For many air pollutants there is not a threshold below which there is no health impact so it is important that energy infrastructure schemes consider not just how a scheme may impact statutory air quality limits, objectives or targets but also measures to mitigate all emissions in order to minimise human exposure to air pollution, especially for those who are more susceptible to the impacts of poor air quality’.</i>                       | In addition to assessing the impacts on air quality, the assessment has also considered mitigation measures to reduce human exposure to air pollution where practicable, in the form of embedded design, control and additional mitigation to reduce likely significant adverse air quality effects. This is outlined in section 13.6 and <b>Appendix 4A Draft Outline Code of Construction Practice</b> .  |
| Paragraph 5.2.4  | <i>‘A particular effect of air emissions from some energy infrastructure may be eutrophication, which is the excessive enrichment of nutrients in the environment. Eutrophication from air pollution results mainly from emissions of NO<sub>x</sub> and ammonia’.</i>  | The Project has the potential to lead to eutrophication effects from vehicle exhaust emissions of NO <sub>x</sub> and NH <sub>3</sub> associated with the construction and operational phases of the Project. Preliminary information on traffic flows associated with the construction of the Project has been screened against the relevant thresholds in accordance with the Institute of Air Quality Management (IAQM) Nature Conservation Sites Guidance (Ref 13.19) to confirm the need for quantification of impacts of NO <sub>x</sub> , NH <sub>3</sub> and nitrogen deposition at ecological sensitive receptors; this is summarised in section 13.7. Further screening of the predicted construction and operational traffic flows, based on the final design, will be undertaken as part of the ES to determine the need for detailed assessment of the impacts of the Project. |
| Paragraph 5.2.7  | <i>‘Proximity to emission sources can have significant impacts on sensitive receptor sites for air quality, such as education or healthcare sites, residential use or sensitive or protected ecosystems. Projects near a sensitive receptor site for air quality should only be proposed in exceptional circumstances if no viable alternative site is available. In these instances, substantial mitigation of any expected emissions will be required’.</i> | The air quality assessment has considered effects at sensitive receptors such as those described in paragraph 5.2.7 of NPS EN-1 (Ref 13.15). Where appropriate, additional mitigation measures shall be implemented to reduce the likely significant impacts on air quality. These are outlined in section 13.6 and <b>Appendix 4A Draft Outline Code of Construction Practice</b> .  |

| Policy Reference | Policy Context   | How it will be considered   |
|------------------|--|---|
| Paragraph 5.2.8  | <i>‘Where the Project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES’.</i>   | As part of this PEIR, initial Project data have undergone preliminary screening to determine the likelihood for significant effects on local air quality; the outcome has been set out in section 13.7 and <b>Table 13.27</b> . Further screening will be undertaken as part of the ES to determine the need for assessment of the impacts of the Project.  |
| Paragraph 5.2.9  | <p data-bbox="327 504 685 536"><i>‘The ES should describe:</i></p> <ul data-bbox="371 552 1200 983" style="list-style-type: none"> <li data-bbox="371 552 1120 616">• <i>existing air quality concentrations and the relative change in air quality from existing levels;</i></li> <li data-bbox="371 632 1200 791">• <i>any significant air quality effects, mitigation action taken and any residual effects, distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;</i></li> <li data-bbox="371 807 1200 935">• <i>the predicted absolute emissions, concentration change and absolute concentrations as a result of the proposed project, after mitigation methods have been applied; and</i></li> <li data-bbox="371 951 954 983">• <i>any potential eutrophication impacts.’</i></li> </ul> | Should further screening of traffic data for any of the Project stages indicate that detailed assessment is required, then dispersion modelling will be undertaken as part of the air quality assessment presented in the ES to determine the impact of pollutant concentrations resulting from the Project at relevant sensitive human and ecological receptors and changes in pollutant deposition rates on ecological receptors.     |
| Paragraph 5.2.11 | <i>‘Defra publishes future national projections of air quality based on estimates of future levels of emissions, traffic, and vehicle fleet. Projections are updated as the evidence base changes and the applicant should ensure these are current at the point of an application. The applicant’s assessment should be consistent with this but may include more detailed modelling and evaluation to demonstrate local and national impacts. If an applicant believes they have robust additional supporting evidence, to the extent they could affect the conclusions of the assessment, they should include this in their representations to the Examining Authority along with the source’.</i>  | The air quality assessment has been based on the latest Defra tools, for example, the latest background concentration maps (Ref 13.21). Where detailed air quality modelling is undertaken, the latest versions of the Local Air Quality Management (LAQM) tools will be used, for example, Defra’s latest Emissions Factor Toolkit (EFTv13.1) (Ref 13.22) and latest Calculator for Road Emissions of Ammonia (CREAM V2A) (Ref 13.22). |

| Policy Reference  | Policy Context   | How it will be considered  |
|---|--|--|
| Paragraph 5.2.12  | <i>‘Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits, objectives or targets, or affect the ability of a noncompliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy at the time of the decision, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that those statutory limits, objectives or targets are not breached’.</i>  | <p>A preliminary assessment of construction phase impacts has been undertaken as part of this PEIR and proportionate mitigation measures have been identified; these are presented in <b>Appendix 4A Draft Outline Code of Construction Practice</b>. These will be updated, where appropriate, at the ES stage based on the Project’s final design information.</p> <p>Screening of the predicted construction and operational traffic flows, based on the final design, will be undertaken as part of the ES to determine the need for detailed assessment of the impacts of the Project. Where this indicates that the Project will lead to a breach of any relevant statutory air quality limits, objectives or targets, or affects the ability of a noncompliant area to achieve compliance within the timescales set out in the most recent relevant air quality plan/strategy, then relevant additional mitigation to reduce significant adverse air quality effects will be implemented (where practicable).</p> |
| <b>5.7 Dust, Odour, Artificial Light, Smoke, Steam and Insect Infestation</b> |  |  |
| Paragraph 5.7.1   | <i>‘During the construction, operation and decommissioning of energy infrastructure there is potential for the release of a range of emissions such as odour, dust, steam, smoke, artificial light and infestation of insects. All have the potential to have a detrimental impact on amenity or cause a common law nuisance or statutory nuisance under Part III, Environmental Protection Act 1990. However, they are not regulated by the environmental permitting regime, so mitigation of these impacts will need to be included in the Development Consent Order.’</i> | <p>The air quality assessment has considered the impact on dust disamenity at relevant sensitive (human and ecological) receptors in accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction (Ref 13.23) and the outcomes of the assessment are presented in <b>Table 13.27</b>.</p>  |
| NPS EN-5 (2024) (Ref 13.18)   |  | <p>There are no relevant considerations for air quality noted within EN-5.</p>   |

## Other National Policy

13.2.10 A summary of other relevant national policy considered in the scope of effects on air quality includes:

- The UK Air Quality Strategy 2007 (Ref 13.24);
- The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations 2017 (Ref 13.25);
- The Clean Air Strategy 2019 (Ref 13.26);
- The Environmental Improvement Plan 2023 (Ref 13.27);
- The Air Quality Strategy Framework for Local Authority Delivery (for England) 2023 (Ref 13.28); and
- National Planning Policy Framework (NPPF) (Ref 13.29).

## Regional and Local Policy

13.2.11 **Chapter 2 Legislative, Regulatory and Planning Policy Context** sets out relevant regional and local policy considered by the Project.

13.2.12 Regional and local plans or policies relevant to this assessment are as follows:

- Amber Valley Borough Council (AVBC) Local Plan (Adopted 2006)<sup>2</sup> (Ref 13.30);
- Bolsover District Council (BDC) (Adopted 2020) (Ref 13.31);
- Chesterfield Borough Council (CBC) Local Plan (Adopted 2020) (Ref 13.32);
- Derby City Council (DCC) Core Strategy (Adopted 2017) (Ref 13.33);
- Erewash Borough Council (EBC) Core Strategy (Adopted 2014) (Ref 13.34);
- North East Derbyshire Local Plan 2014-2034 (Adopted 2021) (Ref 13.35);
- South Derbyshire District Council (SDDC) Local Plan (Adopted 2016) (Ref 13.36);
- South Derbyshire Air Quality Strategy (Ref 13.37) aims to reduce the health impact of poor air quality for the people and ecology of South Derbyshire. The Strategy encompasses the areas under the administrative control of Derbyshire County Council and Derby City Council (DCC), and sets out policies which include:
  - reducing the sources of pollution within and outside South Derbyshire which contribute to poor air quality;
  - prioritising and supporting those interventions which offer additional health benefits;
  - mitigating the impacts of poor air quality on health; and
  - balancing the occasional tensions between climate change interventions and local air quality interventions.

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<sup>2</sup> AVBC is currently consulting on modifications and updates to the existing local plan.

## Guidance

- 13.2.13 Relevant guidance, specific to air quality, that has informed the PEIR is listed below. This will also be considered as part of the assessment reported within the ES:
- Environmental Protection UK (EPUK)/IAQM: Land Use Planning and Development Control - Planning for Air Quality (v.1.2) (hereafter referred to as the 'EPUK/IAQM Planning Guidance') (Ref 13.38)<sup>3</sup>;
  - Natural England's Approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001) (Ref 13.39);
  - National Planning Practice Guidance (2019) (Ref 13.40);
  - IAQM: A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (v.1.1) (hereafter referred to as the 'IAQM Nature Conservation Sites Guidance') (Ref 13.19);
  - Joint Nature Conservation Committee's guidance on Decision-Making Thresholds for Air Pollution (Ref 13.41);
  - Defra: Local Air Quality Management Technical Guidance LAQM.TG(22) (Ref 13.13);
  - IAQM: Guidance on the Assessment of Dust from Demolition and Construction (v.2.2) (hereafter referred to as the 'IAQM Construction Dust Guidance') (Ref 13.23);
  - National Highways' Design Manual for Roads and Bridges (DMRB) LA 105 - Air Quality (Vertical Barriers) (Ref 13.42); and
  - Defra's PM<sub>2.5</sub> Targets: Interim Planning Guidance (Ref 13.43).

## 13.3 Scoping Opinion and Consultation

### Scoping Opinion and Stakeholder Feedback

- 13.3.1 A Scoping Report (Ref 13.44) was prepared and submitted by National Grid to the Planning Inspectorate in October 2024. The Planning Inspectorate provided a Scoping Opinion (Ref 13.45) on behalf of the Secretary of State (SoS) for the Department for Energy Security and Net Zero (DESNZ) in December 2024. Responses from the Planning Inspectorate in relation to the air quality and how these requirements will be addressed by the applicant, are set out in **Table 13.5**.

**Table 13.5: Summary of the Planning Inspectorate's Scoping Opinion comments in relation to air quality**

| ID    | Planning Inspectorate's Comments   | National Grid's Response  |
|-------|--|---|
| 3.8.1 | <b>Diverted traffic – construction:</b> Planning Inspectorate agreed that likely significant effects from construction traffic (including diverted traffic) emissions can be scoped out of the ES provided that the predicted volumes of diverted traffic would not exceed the relevant indicative criteria for air quality assessment set out in the Institute of Air Quality Management (IAQM) guidance. | Information on initial construction traffic flows has been screened against the thresholds for air quality assessment set out in the relevant guidance (Ref 13.38 and Ref 13.18). This is addressed in section 13.7. Information on diverted traffic will be available at the ES stage. |

<sup>3</sup> A full review of the EPUK/IAQM Planning Guidance is underway by the IAQM and a draft of the revised guidance is expected by late summer 2025.

| ID    | Planning Inspectorate's Comments   | National Grid's Response   |
|-------|--|--|
| 3.8.2 | <b>Operational traffic emissions – operation including maintenance:</b> Planning Inspectorate agreed that likely significant effects from operational traffic (including maintenance) emissions can be scoped out of the ES provided that the predicted volumes of diverted traffic would not exceed the relevant indicative criteria for air quality assessment set out in the IAQM guidance. | The number of operational and maintenance vehicle movements associated with the Project is expected to be small and will be limited to those associated with the inspection and maintenance of infrastructure. As such, no likely significant effects on air quality are anticipated. The anticipated number of operational vehicle movements will be confirmed at the ES stage. |

13.3.2 **Table 13.6** provides a summary of the consultation feedback from specific stakeholders as part of the Scoping Opinion which relates to air quality.

**Table 13.6: Summary of stakeholder Scoping Opinion responses in relation to air quality**

| Consultee                 | Summary of Key Topics Discussed and Key Outcomes   | Response   |
|---------------------------|--|--|
| Forestry Commission       | The effect of air pollution on woodland due to increases in traffic or dust from construction associated with the Project should be considered.  | Information on initial construction traffic flows has been screened against the thresholds for air quality assessment set out in the relevant guidance to determine the likelihood for significant effects on sensitive ecological receptors (including woodland) (Ref 13.18). Impacts associated with construction dust on 'ecological receptors' has been determined in line with IAQM guidance (Ref 13.23). The findings from these preliminary assessments are summarised in section 13.7. |
| Natural England           | Consideration should be given to the assessment of impacts of road traffic emissions associated with the Project on 'European Sites'.  | The potential for road traffic impacts on European Sites is summarised in section 13.4   |
| UK Health Security Agency | Reducing public exposure to non-threshold pollutants (such as particulate matter and NO <sub>2</sub> ) below AQS will have potential public health benefits and should be assessed through a proportionate assessment that considers the likelihood for significant effects. | Preliminary Project information has been screened against the assessment thresholds set out in the relevant guidance (Ref 13.23, Ref 13.38 and Ref 13.19) and summarised in section 13.7.  |

| Consultee | Summary of Key Topics Discussed and Key Outcomes   | Response   |
|-----------|--|--|
|           | Approaches are supported which minimise or mitigate public exposure to non-threshold air pollutants, address inequalities (in exposure) and maximise co-benefits. These should be considered during development design, environmental and health impact assessment, and development consent. | The Project has been designed to avoid sensitive (human and ecological) receptors as far as practicable; design embedded mitigation measures are summarised in section 13.6. |

13.3.3 Initial consultation on air quality has been undertaken with stakeholders at the AVBC, BDC, CBC, DCC, EBC, North East Derbyshire District Council (NEDDC) and SDDC. At the time of writing, data have only been provided by the stakeholders as outlined in **Table 13.7**. These data have been presented in this assessment; no comments relevant to the scope and methodology of the assessment have been received.

**Table 13.7: Summary of stakeholder engagement in relation to air quality**

| Date and Method of Consultation               | Consultee   | Summary of Key Topics Discussed and Key Outcomes   | Response  |
|---|-------------|--|---|
| February 2025 (email request for information) | AVBC        | Air quality monitoring data; list of Part A2/B permitted processes   | -   |
|   | BDC / NEDDC | 2024 Annual Status Reports; list of Part A2/B permitted processes  | -   |
|   | EBC         | 2024 and 2025 Annual Status Reports; list of Part A2/B permitted processes   | -   |
| June 2025 (email request for information)     | CBC         | 2025 Annual Status Report  | -   |
|   | DCC         | Air quality monitoring data; list of permitted Part A2/B processes; 2025 Annual Status Report                      | -   |
|   | SDDC        | List of Part A2/B permitted processes; 2025 Annual Status Report   | -   |
| August 2025 (presentation)                    | BDC / NEDDC | Summary of assessment to be provided in the PEIR and overview of baseline air quality monitoring survey locations. | Requested that air quality (including dust) monitoring continue during the works phase. |
|   | AVBC        |  | No comments received. AVBC provided monitoring data for 2024.                           |
|   | CBC         |  |   |

## 13.4 Assessment Methodology

13.4.1 **Chapter 5 Approach to Preliminary Environmental Information Report** sets out the overarching approach which has been used in developing the PEIR. This section describes the technical methods used to determine the baseline conditions, receptor sensitivity and magnitude of change. This section also identifies further surveys and assessment that will be undertaken and reported in the ES.

### Scope of the Assessment

13.4.2 The scope of the assessment considers the impact of the following:

- Dust from on-site construction activities (including enabling works) and off-site trackout<sup>4</sup> by construction vehicles on sensitive (human and ecological) receptors. The main potential impacts are dust soiling (which can lead to the loss of amenity) and the deterioration of human health as a result of increases in concentrations of particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>).
- Vehicular tail-pipe emissions containing air pollutants released by construction vehicles associated with the Project using the Local Road Network (LRN). The emissions from vehicles include but are not limited to NO<sub>x</sub> (comprising nitrogen monoxide, NO, and nitrogen dioxide, NO<sub>2</sub>), NH<sub>3</sub> and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Emissions from vehicles also include those associated with brake and tyre wear. As the duration of the construction programme exceeds 24 months, the potential for impacts on compliance road links is also considered.

13.4.3 This approach is consistent with the Scoping Report submitted to the Planning Inspectorate (Ref 13.44).

13.4.4 Initial estimates of the type and number of construction machinery and plant (including Non-Road Mobile Machinery or 'NRMM') to be used on site have been provided<sup>5</sup>. These are given in **Chapter 4 Description of the Project**. It is anticipated that emissions will be limited to the working week and are likely to be intermittent and short in duration. Equipment will be in use in predominantly remote locations, i.e., where there is limited potential for exposure across the Project, for enabling works, the construction of safe working areas (Equipotential zones), foundations, haul roads and bellmouths, vegetation clearing, cable stringing and clipping, and pylon setup and removal. Through regular maintenance and the selection of equipment that meets the NO<sub>x</sub> and particulate matter engine emission measure requirements outlined in section 13.6.3, no significant effect is anticipated. Information on construction machinery and plant will be rescreened at the ES stage.

13.4.5 Initial information provided by the construction delivery partners indicates that generators up to 10 kilovolt-ampere (kVA) will be installed across the construction route of the Project to provide power to welfare units and security systems including lighting, as outlined in **Chapter 4 Description of the Project**. It is anticipated that they will be used concurrently at the (conductor) pull sites, installed at each of the construction compounds and at the 186 pylon sites (as given in **Appendix 4B Indicative Pylon Schedules**). While power to welfare units will be required intermittently during the working week, it is anticipated that the security systems

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<sup>4</sup> Trackout is the movement of dust/mud onto the public highway via construction vehicles.

<sup>5</sup> These include telehandlers, cranes, piling rigs, 20 tonne excavators, medium rollers, 5 tonne dumpers, tractors and winches.

would need continuous power. The effect of generator use on ecological sites is scoped out of the assessment as emissions are judged unlikely to have a material effect on pollutant concentrations and deposition rates. This information will be rescreened at the ES stage to determine the need for detailed assessment.

- 13.4.6 The duration of the construction programme is expected to exceed 24 months, therefore an initial assessment has been undertaken in accordance with DMRB LA 105 (Ref 13.42) to identify the intersecting Strategic Road Network links where changes in traffic flows meet the DMRB LA 105 thresholds, and which form part of Defra's Pollution Climate Mapping (PCM) model (Ref 13.46).
- 13.4.7 Information on the duration and change in traffic flows associated with planned diversions, as well as the proposed routes, are yet to be determined and it is anticipated that they will be set out in the Traffic and Transport chapter at the ES stage. The Planning Inspectorate has also stated (response ID 3.8.1 in **Table 13.6**) that vehicle emissions associated with diverted traffic can be scoped out of the ES provided it can be demonstrated that the predicted volumes of diverted traffic would not exceed the relevant indicative screening criteria for air quality assessment set out in the EPUK/IAQM Planning Guidance (Ref 13.38) and the IAQM Nature Conservation Sites Guidance (Ref 13.19), to be confirmed at the ES stage. Detailed quantitative modelling will only be undertaken where the relevant criteria are exceeded.
- 13.4.8 Similarly, vehicle emissions associated with operational traffic can be scoped out of the ES provided that the predicted traffic volumes would not exceed the relevant indicative criteria for air quality assessment set out in the EPUK/IAQM Planning Guidance (Ref 13.38) and the IAQM Nature Conservation Sites Guidance (Ref 13.19). While exact numbers are currently unknown, it is anticipated, based on similar scale projects of this type, that the number of movements generated are very unlikely to exceed the criteria in the guidance. This will be confirmed at the ES stage when operational traffic numbers are available.
- 13.4.9 Comments received from the Planning Inspectorate's Scoping Opinion (Ref 13.45) have also been addressed throughout the chapter and are outlined in **Table 13.7**.

## Construction Dust Assessment

- 13.4.10 The assessment of construction dust impacts has been undertaken in line with IAQM Construction Dust Guidance (Ref 13.23). This guidance provides a risk-based approach to the assessment of the potential for dust impacts on sensitive (human and ecological) receptors from four types of activities, taking account of the sensitivity of the environment surrounding the works: demolition; earthworks; construction; and trackout.

### Sensitivity

- 13.4.11 For the assessment of construction phase dust impacts, a receptor is defined within the IAQM Construction Dust Guidance (Ref 13.24) as:
- 'a location that may be affected by dust emissions during demolition and construction. Human receptors include locations where people spend time and where property may be impacted by dust. Ecological receptors are habitats that might be sensitive to dust'*.

- 13.4.12 For ecological receptors, these include locations where there could be direct impacts on vegetation or aquatic ecosystems due to dust deposition, and indirect impacts on fauna, e.g. on foraging habitats.
- 13.4.13 Receptor sensitivity to dust impacts is defined as either low, medium or high in the IAQM Construction Dust Guidance (Ref 13.23) as outlined **Table 13.8**.

**Table 13.8: Descriptions of levels of receptor sensitivity**

| <b>Level of Receptor Sensitivity</b> | <b>Dust Soiling Effects</b>  | <b>Human Health</b>   | <b>Ecological Effects</b>   |
|--------------------------------------|--|---|---|
| Low                                  | Locations where the enjoyment of amenity would not reasonably be expected and exposure would be for limited periods, e.g. footpaths, shopping streets and car parks.   | Locations where human exposure is transient, e.g. public footpaths, playing fields, parks and shopping streets.   | Locally designated ecological sites such as LNRs and LWSs (which are equivalent to County Wildlife Sites in England, (Ref 13.47)) with dust-sensitive features.   |
| Medium                               | Locations where users would expect to enjoy a reasonable level of amenity and value could be diminished by dust soiling, e.g. parks and places of work.  | Locations where the humans exposed are workers and exposure is a period of time equivalent to the (daily mean) AQO for PM10, e.g. offices and shops.  | Nationally designated ecological sites, e.g. a SSSI with dust-sensitive features.   |
| High                                 | Locations where users can expect enjoyment of a high level of amenity or where the appearance, aesthetics or value of property would be diminished by soiling. Consideration of where people or property are expected to be present continuously for extended periods of time, e.g. residential properties, museums, medium- and long-term carparks. | Where human receptors are expected to be present continuously for extended periods of time equivalent to the (annual mean) AQO for PM10, e.g. residential properties, hospitals, schools and care homes (as defined in Box 1-1 of LAQM TG22, (Ref 13.3) | Internationally or nationally designated ecological sites, e.g. Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and Ramsar sites with dust-sensitive features. They can also include local sites designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings and locations where there is a community of a particularly dust-sensitive species, e.g., vascular species included in the Red Data List for Great Britain. |

13.4.14 The sensitivity of an area to dust soiling effects on people and property takes into account the receptor sensitivity (given above) and the number of receptors within predefined distances given in IAQM Construction Dust Guidance (Ref 13.23), i.e., 0-20 m, 0-50 m, 0-100 m and 0-250 m from the source. Determination of the sensitivity of an area to human health impacts uses a similar approach as dust soiling but requires estimated background PM<sub>10</sub> levels taken from Defra’s background maps (Ref 13.20) to be considered as well. Other factors, such as a history of dust generating activities in the area, local topography, geography, features, e.g. the presence of trees that may provide screening, and meteorology, also need to be considered when determining receptor sensitivity.

**Impact magnitude**

13.4.15 The level of magnitude is determined by the scale and nature of works that will be undertaken using the relevant descriptors outlined within IAQM Construction Dust Guidance (Ref 13.23) and presented in **Table 13.9**.

**Table 13.9: Descriptions of levels of magnitude**

| Level of Magnitude | Description   |
|--------------------|---|
| Small              | Demolition volume under 12,000 m <sup>3</sup> less than 6 m above ground level, total site area less than 18,000 m <sup>2</sup> , soil type with large grain size, construction material with low potential for dust release, less than 20 Heavy Duty Vehicle (HDV) <sup>6</sup> trips per day, unpaved road length less than 50 m.   |
| Medium             | Demolition activities 6 m - 12 m above ground level with a total volume of 12,000 m <sup>3</sup> - 75,000 m <sup>3</sup> , moderately dusty soil type, potentially dusty construction material, total site area of 18,000 m <sup>2</sup> to 110,000 m <sup>2</sup> , 20 to 50 HDV trips per day, unpaved road length 50 to 100 m.   |
| Large              | On-site crushing and screening, demolition activities greater than 12 m above ground level and volume above 75,000 m <sup>3</sup> , total site area greater than 110,000 m <sup>2</sup> , more than 50 heavy earth moving vehicles active at any one time, on-site concrete batching, sandblasting, more than 50 HDV outward movements per day, unpaved road length greater than 100 m. |

**Risk of impacts**

13.4.16 The level of magnitude and the sensitivity of the area are combined to determine the risk of impacts without mitigation applied. **Table 13.10** enables determination of the risk of impacts from demolition (associated with the dismantling of existing structures) and **Table 13.11** enables determination of the risk of impacts from earthworks, construction and trackout; both tables have been adapted from the IAQM Construction Dust Guidance (Ref 13.23).

<sup>6</sup> Heavy Duty Vehicles = Heavy Goods Vehicles (HGVs) plus Public Service Vehicles, e.g., buses and coaches.

**Table 13.10: Risk of impacts from demolition activities**

| Sensitivity of Surrounding Area | Dust Emission Magnitude |             |             |
|---------------------------------|-------------------------|-------------|-------------|
|                                 | Large                   | Medium      | Small       |
| High                            | High Risk               | Medium Risk | Medium Risk |
| Medium                          | High Risk               | Medium Risk | Low Risk    |
| Low                             | Medium Risk             | Low Risk    | Negligible  |

**Table 13.11: Risk of impacts from earthworks, construction and trackout activities**

| Sensitivity of Surrounding Area | Dust Emission Magnitude |             |            |
|---------------------------------|-------------------------|-------------|------------|
|                                 | Large                   | Medium      | Small      |
| High                            | High Risk               | Medium Risk | Low Risk   |
| Medium                          | Medium Risk             | Medium Risk | Low Risk   |
| Low                             | Low Risk                | Low Risk    | Negligible |

- 13.4.17 The risk category identified for each construction activity (demolition, earthworks, construction and trackout) is used to determine the level of mitigation required. For those cases where the risk category is negligible, no mitigation measures beyond those required by legislation will be required.
- 13.4.18 Examples of recommended mitigation measures are given in the IAQM Construction Dust Guidance (Ref 13.23) and are divided into general measures, applicable to all sites, and those applicable specifically to each construction activity. The mitigation measures required are based on whether the risk determined for each activity is high, medium or low. For general mitigation measures, the highest risk category is applied.
- 13.4.19 Construction dust mitigation measures have been derived for the Project from the assessment findings of the Project; these are given in section 13.6 below.

**Significance of effects**

- 13.4.20 The IAQM Construction Dust Guidance recommends that no assessment of the significance of effects is made without mitigation in place, as it is assumed that mitigation will be secured by the DCO requirements, legal requirements or regulations. The main purpose of the dust risk assessment is to ensure that the proposed mitigation is appropriate for the Project.
- 13.4.21 With appropriate mitigation in place, the IAQM Construction Dust Guidance indicates that the residual effect of dust emissions associated with the demolition and construction can be classified as being not significant.

## Generator Use

### Sensitivity

- 13.4.22 Relevant sensitive human receptor locations are places where members of the public might be expected to be regularly present over the averaging period of the AQOs given in **Table 13.1**. This includes but is not limited to the building façades of residential properties, schools, care homes and hospitals (as defined in section 13.1) which are considered high sensitivity human receptors where all AQOs apply. In the case of the 1-hour NO<sub>2</sub> objective this includes any outdoor locations where members of the public might reasonably expect to spend one hour or longer including the gardens of residential properties.

### Impact magnitude

#### Human sensitive receptors

- 13.4.23 The assessment of the impacts of emissions from generators is based on the EPUK/IAQM Planning Guidance (Ref 13.38). The guidance provides an indicative threshold for NO<sub>x</sub> emissions from single or combined sources, below which the impact of the emissions is unlikely to give rise to significant effects.
- 13.4.24 Where effects are likely to occur, the guidance provides an indication of the likely magnitude of impact for short-term emissions as a percentage of the short-term Air Quality Assessment Level (AQAL). For long-term impacts, the magnitude of impact is based on the change in pollutant concentration resulting from the project as a percentage of the AQAL as shown in **Table 13.12** and established in the EPUK/IAQM Planning Guidance (Ref 13.38). The impact descriptors given in the table include (in brackets) the analogous impact magnitude criteria given in **Chapter 5 Approach to the Preliminary Environmental Information Report** where they are different from those used in the EPUK/IAQM Planning Guidance (Ref 13.38).

**Table 13.12: EPUK/IAQM impact descriptors for individual receptors**

| Long-term Average Concentration at Receptor in Assessment Year | Percentage Change in Concentration Relative to Air Quality Assessment Level (AQAL)* |                     |                     |                     |
|--|---|---------------------|---------------------|---------------------|
|  | 1   | 2-5                 | 6-10                | >10                 |
| 75% or less of AQAL  | Negligible  | Negligible          | Slight (small)      | Moderate (medium)   |
| 76 - 94% of AQAL   | Negligible  | Slight (small)      | Moderate (medium)   | Moderate (medium)   |
| 95 - 102% of AQAL  | Slight (small)  | Moderate (medium)   | Moderate (medium)   | Substantial (large) |
| 103 - 109% of AQAL   | Moderate (medium)   | Moderate (medium)   | Substantial (large) | Substantial (large) |
| 110% or more of AQAL   | Moderate (medium)   | Substantial (large) | Substantial (large) | Substantial (large) |

Note:

\* AQAL = Air Quality Assessment Level, which may be an AQO or EU limit or target value.

## Significance of effects

### Human sensitive receptors

- 13.4.25 For human sensitive receptors, determination of significance will be based upon professional judgement of the overall significance of effects taking account of factors including existing and future air quality in the absence of the Project, the extent of current and potential future exposure to impacts and the influence or assumptions adopted.

## Construction Traffic Road Emissions Assessment

- 13.4.26 For the purposes of the PEIR, an initial screening assessment of construction traffic flows has been completed based upon preliminary construction traffic projections (as given in **Chapter 12 Traffic and Transport**).
- 13.4.27 Projected changes in Annual Average Daily Traffic (AADT, vehicles per day) flows for both Light Duty Vehicles (LDVs)<sup>7</sup> and HDVs have been screened to determine where detailed assessment (using dispersion modelling) is likely to be required, the findings of which will be reported in the ES submitted as part of the DCO application. This screening exercise is intended to provide an indication of where there is greatest potential for changes in air quality as a result of construction traffic, but it is noted that no dispersion modelling has been completed at this stage.
- 13.4.28 The impact of construction traffic vehicle emissions on sensitive (human and ecological) receptors within 200 m of affected roads will be considered. Beyond this distance no significant effects are expected (Ref 13.48).
- 13.4.29 The changes in traffic flows have been calculated between the 'Do Something' scenario, i.e., with the Project, and the 'Do Minimum' scenario, i.e., without the Project. Where changes in traffic flows resulting from the construction of the Project meet the assessment criteria within the EPUK/IAQM Planning Guidance (Ref 13.38) and set out below, then detailed dispersion modelling will be undertaken to determine the impact on existing human sensitive receptors:
- a change in LDV flows of more than 100 AADT (vehicles/day) within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere; and
  - a change in HDV (>3.5 tonnes) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.
- 13.4.30 Road links that do not meet the criteria will not be subject to detailed assessment.
- 13.4.31 The likelihood of the Project design to lead to the realignment of roads by 5 m or more and/or to introduce new junctions or remove junctions near to relevant receptors, which also form part of the change criteria given in the EPUK/IAQM Planning Guidance (Ref 13.38), will be considered in the ES when detailed design information will be available. The scope of highways improvements would be subject to road safety audits and co-ordination with the relevant highway authority although it is considered that the scope of these works would be localised in nature such as areas of widening to facilitate passing places for construction access along narrower sections of the LRN.

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<sup>7</sup> Light Duty Vehicles = cars and Light Goods Vehicles (LGVs)

- 13.4.32 Based on an initial review of the existing road network that may be used by traffic associated with the Project, detailed assessment of impacts on sensitive ecological receptors within 200 m of the affected roads may be required if the predicted change in HDV exceeds the change threshold given in the IAQM Nature Conservation Sites Guidance (Ref 13.19) of 200 AADT. Once available, traffic data will be rescreened against the criteria within the IAQM Nature Conservation Sites Guidance to confirm that this is the case.
- 13.4.33 Given the absence of dispersion modelling outputs, no detailed assessment of impact magnitude or the significance of likely effects has been undertaken for the purposes of the PEIR with respect to road traffic emissions. These assessments will be completed during development of the ES following supplementary screening of finalised traffic projections. Where detailed quantitative modelling is required, the magnitude of impacts and significance of effects will be assessed in accordance with the methodologies set out within EPUK/IAQM Planning Guidance for human receptors (Ref 13.38) and IAQM Nature Conservation Sites Guidance for ecological receptors (Ref 13.19). In summary, the key elements of this are set out in the sections immediately below.

### **Sensitivity**

- 13.4.34 Relevant human sensitive receptors, as defined in section 13.1, will be considered in the construction traffic road emissions assessment.
- 13.4.35 Ecological receptors are considered sensitive if they are classified as a designated site of local, national or international importance<sup>8</sup>. For the road traffic emissions assessment, those relevant to the Project include SSSIs, LNRs, LWS, areas of ancient woodland (AW)<sup>9</sup> and ancient and veteran trees; these are considered as 'high' sensitivity receptors.

### **Impact magnitude**

- 13.4.36 If the screening criteria are met or exceeded, then the traffic emissions will be calculated using the latest available version of the Defra Emissions Factors Toolkit (currently EFT v13.1) (Ref 13.22) for human sensitive receptors, and using the latest available version of the Calculator for Road Emissions of Ammonia (currently CREAM V2A) (Ref 13.22) for ecological sensitive receptors. These will be used in conjunction with traffic flow information (vehicle flows, speed and proportions of LDVs and HDVs) from the Transport Assessment that will be undertaken to inform the ES. For construction traffic, this would also consider the need for road closures and diversions where necessary. Dispersion modelling would be undertaken using Cambridge Environmental Research Consultants (CERC)'s Air Dispersion Modelling System-Roads (currently ADMS-Roads v5.0.1) dispersion modelling programme (Ref 13.49).
- 13.4.37 The conversion of road NO<sub>x</sub> to NO<sub>2</sub> will be undertaken using the latest version of the NO<sub>x</sub> to NO<sub>2</sub> Calculator (currently v9.1), available on Defra's website Ref 13.50). Road NO<sub>x</sub> will be inferred from available roadside NO<sub>2</sub> measurements collected as part of the Project's baseline survey and/or local authority monitoring data using Defra's NO<sub>x</sub> to NO<sub>2</sub> calculator.

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<sup>8</sup> There are no Ramsar, SAC and SPA sites (termed 'European Sites') within the Project Study Areas (or within 10 km of the draft Order Limits).

<sup>9</sup> Where unnamed areas of ancient woodland have been identified within the relevant study areas, these have been named by the Project's Ecologist.

- 13.4.38 Calculation of emissions from traffic presented in the ES will be undertaken with the most recently available local air quality management tools and background air quality concentrations (based on 2021 background mapping) from Defra (Ref 13.20).
- 13.4.39 Latest available background air quality concentrations and deposition rates from APIS (Ref 13.14) will be used to inform the assessment of impacts from road traffic emissions on ecological sensitive receptors.
- 13.4.40 Defra's tools, background mapping and APIS data are periodically updated, and this may occur during the EIA process. Where this occurs, the same tools and data will be used through the development of the EIA to maintain continuity, where appropriate, through the Project.
- 13.4.41 The magnitude of impact will be assessed by comparing the predicted concentration in the Do Something scenario, i.e., with the contribution from construction traffic flows associated with the Project, to the Do Minimum scenario, i.e., without the contribution from construction traffic flows associated with the Project.

#### Human sensitive receptors

- 13.4.42 For human receptors, the magnitude of impact will be assessed by comparing the percentage change in modelled concentrations between the Do Something and Do Minimum scenarios at identified receptors relevant to the AQOs, as shown in **Table 13.12** and established in the EPUK/IAQM Planning Guidance (Ref 13.38).

#### Ecological sensitive receptors

- 13.4.43 The magnitude of impact will be assessed by comparing the percentage change in modelled concentrations and deposition rates between the Do Something and Do Minimum scenarios (as above) at the identified ecological sensitive receptors relevant to the critical levels, critical loads and deposition rates shown in **Table 13.18**.

### Significance of effects

#### Human sensitive receptors

- 13.4.44 The level of significance is evaluated by assessing the magnitude of impact in pollutant concentrations between the Do Something and Do Minimum scenarios combined with the background concentrations. It is likely that moderate or substantial impacts will be judged as giving rise to significant effects and negligible or slight impacts will not result in a significant effect.

#### Ecological sensitive receptors

- 13.4.45 For ecological sensitive receptors, consideration of significance is focused on the impacts on annual mean NO<sub>x</sub> and NH<sub>3</sub> concentrations and nitrogen deposition in the opening year. For NO<sub>x</sub> and NH<sub>3</sub>, if the change is less than 1 per cent of the relevant critical level (30 µg/m<sup>3</sup> for NO<sub>x</sub> and 1 µg/m<sup>3</sup> or 3 µg/m<sup>3</sup> for NH<sub>3</sub>, depending on the presence or absence of lichens and bryophytes) then the effect is deemed not significant. For nitrogen deposition, if the change is less than 1 per cent of the relevant lower critical load (which is site specific and obtained from APIS) then the effect is deemed not significant. However, where a change is greater than 1 per cent of the relevant critical level/lower critical load, the effect cannot be discounted as not significant and must be judged by a qualified ecologist.

## Preliminary Assessment Assumptions and Limitations

- 13.4.46 The assessment has been undertaken based on the preliminary Project design information, as outlined in **Chapter 4 Description of the Project**. This information is iterative and will be updated in the ES as the design evolves and any changes are made. The following assumptions and limitations are applicable to the preliminary air quality assessment of the Project:
- Information on construction plant and machinery, including generator use, has been provided by the Project's construction delivery partners for use in this PEIR and is based on the current design; consequently, the findings presented may change as the design evolves.
  - Construction traffic forecasts which have been used to undertake initial screening of likely air quality effects due to road traffic emissions, are based on initial estimates provided by the Project's construction delivery partners. The screening outcomes reported within the PEIR may therefore change following further assessment of refined traffic projections at the ES stage.
  - Information on the duration and change in traffic flows associated with planned diversions, as well as the proposed routes, are yet to be determined. As such, the assessment in the PEIR does not include initial screening of potential effects due to traffic diversions associated with the construction of the Project.
  - The number of operational traffic movements is yet to be determined; consequently, the assessment in the PEIR does not include initial screening of potential effects due to traffic movements associated with the operation of the Project.
- 13.4.47 The assumptions listed above will be reviewed based on the design presented in the DCO application and where required, updated or refined for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

## 13.5 Baseline Conditions

### Study Area

#### Construction dust

- 13.5.1 For construction phase dust impacts, the Study Area has been defined by the screening criteria from the IAQM Construction Dust Guidance (Ref 13.23). The construction dust Study Area is shown within **Figure 13.2 Construction Dust Study Area** and is dictated by the screening criteria below:
- 'human receptors' within the draft Order Limits plus those within the surrounding area extending 250 m from the draft Order Limits, or within 50 m of the proposed routes used by construction traffic on the public highway or up to 250 m from a site entrance; and
  - 'ecological receptors' within the draft Order Limits plus those within the surrounding area extending 50 m from the draft Order Limits, or within 50 m of the proposed routes used by construction traffic on the public highway or up to 250 m from a site entrance.

## **Generator use**

- 13.5.2 No specific guidance exists on the definition for a Study Area from point sources due to the large variation in the area of potential impact from different types of sources. For the purposes of this assessment, a Study Area of up to a 100 m radius from the source is judged to be appropriate for determining the impact on human sensitive receptors given the potential size and duration of the operation to be undertaken. Beyond this distance it is judged that the effect of any emissions on local air quality would be not significant.
- 13.5.3 The effect of generator use on sensitive ecological receptors is scoped out of the assessment as pollutant emissions are not anticipated to occur over a long enough time period to have a material effect on pollutant deposition rates.

## **Road traffic emissions**

- 13.5.4 The Study Area for the assessment of impacts upon human receptors due to road traffic emissions associated with the construction of the Project has been defined with reference to the change criteria given in the EPUK/IAQM Planning Guidance (Ref 13.38). This Study Area comprises any roads where these criteria are exceeded and where there are human sensitive receptors within 200 m (Ref 13.48). The Study Area described within this chapter will be updated as required for the ES, based upon further analysis of traffic projections for the Project.
- 13.5.5 The Study Area for the assessment of impacts upon ecological receptors due to construction traffic emissions associated with the Project, includes ecological sensitive receptors within 200 m of any road links where the projected changes in traffic flow exceed IAQM Nature Conservation Sites Guidance thresholds (Ref 13.19).
- 13.5.6 The Study Areas will be reviewed and updated for the assessment presented in the ES to reflect the latest Project design data.

## **Baseline air quality**

- 13.5.7 The baseline air quality Study Area extends 2 km from the draft Order Limits and has been determined through the identification of key constraints (as outlined below) and professional judgement. This Study Area will be refined for the ES as further detailed design information is made available. Baseline air quality is also assessed within 200 m of the road links projected to exceed the EPUK/IAQM Planning Guidance (Ref 13.38) and/or IAQM Nature Conservation Sites Guidance (Ref 13.19) thresholds and nearby relevant air quality monitoring locations.
- 13.5.8 Background NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations presented in the baseline assessment for the existing and future years presented in the PEIR have been extracted from Defra's background maps (Ref 13.20) for the area extending 2 km from the draft Order Limits.
- 13.5.9 Roadside NO<sub>2</sub> concentrations from local authority monitoring sites within 200 m of roads within the Study Area have been used to determine baseline conditions along routes that may be used by construction traffic. Where monitoring data were limited or unavailable, in particular for PM<sub>10</sub> and PM<sub>2.5</sub>, modelled estimates taken from Defra's background maps (Ref 13.20) have been used to infer levels.

- 13.5.10 Where ecological receptors have been identified within 50 m of the draft Order Limits or within 200 m of any road links where the projected changes in traffic flow exceed IAQM Nature Conservation Sites Guidance thresholds (Ref 13.19), baseline data for pollutants which affect nutrient nitrogen deposition, such as NH<sub>3</sub> and NO<sub>x</sub> concentrations, and nitrogen deposition rates, have been taken from APIS (Ref 13.14). APIS is also the source for the relevant critical levels and loads for the designated sites (Ref 13.13).
- 13.5.11 If detailed assessment of construction traffic impacts is required at the ES stage, future levels of NO<sub>x</sub> and NH<sub>3</sub> will be predicted using future nitrogen growth projections developed by the Joint Nature Conservation Committee (Ref 13.41) (and any subsequent updates).
- 13.5.12 The baseline Study Areas will be reviewed and updated for the ES to reflect the evolved Project design.

## Data Collection

- 13.5.13 The following data have been used to inform the baseline:
- Project-specific baseline air quality monitoring surveys (as outlined in **Appendix 13A Baseline Air Quality Monitoring Surveys and Results**).
  - Defra's background mapping data (from a base year of 2021) which provide predicted air pollution concentrations on a 1 km x 1 km basis for the whole of the UK up to 2040 (Ref 13.20).
  - Defra's PCM data which provide predictions of roadside air pollutant concentrations for 2023 (Ref 13.46).
  - Estimates of background NH<sub>3</sub> concentrations, rates of nitrogen deposition and the critical loads for specific ecological sensitive receptors taken from APIS (Ref 13.14).
  - Defra's AQMA dataset (Ref 13.51) which provides information on locations where air quality may be poor and the specific pollutants for which each AQMA has been declared.
  - Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) (Ref 13.52) which provides information on the location and extent of ecological sensitive receptors together with their designation.
  - Defra's UK Air Information Resource website which provides continuous automatic monitoring data of background and roadside levels of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> taken from Defra's Automatic Urban and Rural Network (AURN) together with site information (Ref 13.53).
  - Local Air Quality Management Reports (Ref 13.54, Ref 13.55, Ref 13.56, Ref 13.57, Ref 13.58, Ref 13.59, and Ref 13.60) which summarise air pollutant levels and trends for each local authority area.
  - Ordnance Survey (OS) AddressBase Plus data and Google Earth Imagery which have been used to identify relevant existing receptors that may be sensitive to dust soiling and changes in local air quality.

- Data on Part A1<sup>10</sup> Permitted Installations held by the Environment Agency (Ref 13.61) and Part A2/B<sup>11</sup> Installations with emissions to air held by the local authorities within their respective administrative areas (Ref 13.62, Ref 13.63, Ref 13.64, Ref 13.65, Ref 13.66, Ref 13.67, and Ref 13.68).

13.5.14 Preliminary projections of changes in traffic flows as a result of the Project have been used to complete an initial screening exercise; these data are detailed in **Chapter 12 Traffic and Transport** and supporting appendices.

## Existing Baseline

13.5.15 The following section outlines the existing air quality baseline for the Study Area and should be read in conjunction with **Figure 13.1 Baseline Air Quality and Constraints**.

13.5.16 There are two main potential sources of air pollution associated with the Project: construction dust emissions and construction road traffic emissions. The baseline presented is therefore based upon an assessment of likely background concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> taken from the sources listed above including Defra mapped estimates and a review of available Defra AURN and local authority and monitoring data.

13.5.17 The Study Area is rural in nature and consists of mostly open agricultural land. There are sensitive human receptors within the Study Area and these are generally located in settlements within 250 m of the draft Order Limits. For example, there are residential properties in the towns of Chesterfield, Alfreton, Ripley, Belper and the periphery of the city of Derby, as well the surrounding smaller settlements. Human sensitive receptors can also be found within 200 m of the routes that are anticipated to be used by construction vehicles, including the main 'A' roads, e.g. A632, A617, A6175, A61, A615, A38, A610, A609, A608, A6096, A6005, A6, A52, A50 and A5132, and adjoining routes.

13.5.18 Ecological receptors that may be sensitive to dust deposition and road traffic emissions are present within the respective Study Areas; these are given in **Table 13.13**.

**Table 13.13: Ecological sensitive receptors within the baseline Study Areas**

| Site Type | Site Name                 |
|-----------|---------------------------|
| SSSI      | Breadsall Railway Cutting |
|           | Morley Brick Pits         |
| LNR       | Breadsall Railway Cutting |
|           | Chellaston Brickworks     |
|           | Oakerthorpe               |
|           | Williamthorpe             |

<sup>10</sup> Large scale industrial processes with a range of environmental impacts (including emissions to air, land and water) requiring authorisation from the Environment Agency.

<sup>11</sup> This would relate to smaller industrial processes regulated by the Local Authority under the Pollution Prevention and Control guidance, including Part A2 processes (which may release to land, air and water) or Part B processes (which only release to air).

| Site Type | Site Name                            |
|-----------|--------------------------------------|
| LWS       | Alfreton Park                        |
|           | Arkwright Town Railway               |
|           | Arleston Canal and Pond              |
|           | Booth's Wood and Brook               |
|           | Breadsall Disused Railway            |
|           | Broadoak Plantation                  |
|           | Brown's Lane Meadows                 |
|           | Chellaston Brickworks                |
|           | Church Lane, Morley                  |
|           | Corbriggs Marsh                      |
|           | Cromford Canal, Lower Hartshay       |
|           | Derby Canal, Borrowash               |
|           | Dunshill Quarry                      |
|           | Dunshill Shelterbelt                 |
|           | Elvaston Castle Country Park         |
|           | Ferriby Brook and Dam Brook          |
|           | Holbrook Disused Sewage Works        |
|           | Holmewood Meadow                     |
|           | Lower Hartshay Wetland <sup>12</sup> |
|           | Meadow Farm Meadow                   |
|           | Millstone Lane Road Verge            |
|           | Oakerthorpe                          |
|           | Owlcotes Wood                        |
|           | River Derwent                        |
|           | Smalley Green Meadow                 |
|           | Stanley-Morley Disused Railway       |
|           | The Warren, Coxbench                 |
|           | Twyford Green Complex                |
|           | Willington Railway Pond No.1         |
|           | Willington Railway Pond No.2         |
| AW        | Booth's Wood                         |
|           | Broadoak Plantation                  |
|           | East of Far Lane <sup>9</sup>        |
|           | Heath Wood                           |
|           | North of Booth's Wood <sup>9</sup>   |
|           | Sutton Springs Wood <sup>9</sup>     |

<sup>12</sup> The Lower Hartshay Wetland LWS covers the same area as the Lower Hartshay Wetland Site of Important Nature Conservation.

## Local air quality management

- 13.5.19 The key air pollutants of concern for human health are NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. There are no AQMAs present within the Study Area; the AQMA nearest to the draft Order Limits is the Derby AQMA No.1 located along Derby's Ring Road approximately 2.5 km south west, declared for exceedances of the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup>. CBC are in the process of revoking Chesterfield AQMA No.1<sup>13</sup> which is located approximately 3.1 km to the north of the Project.
- 13.5.20 Automatic continuous monitoring of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> is not undertaken by the local authorities within the Study Area<sup>14</sup>, therefore current (2025) baseline concentrations have been derived from a combination of modelled estimates of background concentrations provided by Defra for 2025 (reported below) and 2024 levels measured at continuous automatic monitoring stations which make up Defra's AURN sourced from UK-AIR (Ref 13.53) as shown in **Table 13.14**.

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<sup>13</sup> Email correspondence with Steven Payne, District Environmental Health Officer at Chesterfield Borough Council via email dated 9 July 2025.

<sup>14</sup> Although the local authorities do operate continuous, automatic air quality monitoring stations on behalf of Defra within their administrative areas.

**Table 13.14: Defra AURN monitoring data for 2024**

| Site ID  | Site Name                    | Site Type        | Site Coordinates<br>(Based on OS Grid Reference, m) |        | Distance from Draft Order Limits (km) | Pollutant         | Annual Mean Concentration (µg/m <sup>3</sup> )<br>(Rounded to Nearest Whole Number) |       |      |      |      |
|----------|------------------------------|------------------|---|--------|---------------------------------------|-------------------|---|-------|------|------|------|
|          |                              |                  | X   | Y      |                                       |                   | 2020*   | 2021* | 2022 | 2023 | 2024 |
| UKA01027 | Derby Stockbrook Park        | Urban Background | 434245  | 335525 | 5.8                                   | NO <sub>2</sub>   |   |       | -    |      |      |
|          |                              |                  |   |        |                                       | PM <sub>10</sub>  |   | -     |      | 9    | 11   |
|          |                              |                  |   |        |                                       | PM <sub>2.5</sub> |   | -     |      | 6    | 7    |
| UKA00630 | Derby St. Alkmund's Way      | Urban Traffic    | 435763  | 336306 | 5.9                                   | NO <sub>2</sub>   | 26  | 26    | 27   | 26   | 25   |
|          |                              |                  |   |        |                                       | PM <sub>10</sub>  |   |       |      | -    |      |
|          |                              |                  |   |        |                                       | PM <sub>2.5</sub> |   |       | -    |      | 6    |
| UKA00529 | Chesterfield Roadside        | Urban Traffic    | 436349  | 370661 | 4.0                                   | NO <sub>2</sub>   | 15  | 16    | 15   | 14   | 14   |
|          |                              |                  |   |        |                                       | PM <sub>10</sub>  | 12  | 12    | 13   | 12   | 12   |
|          |                              |                  |   |        |                                       | PM <sub>2.5</sub> | 8   | 7     | 8    | 7    | 7    |
| UKA00604 | Chesterfield Loundsley Green | Urban Background | 436470  | 372039 | 4.4                                   | NO <sub>2</sub>   | 8   | 14    | 11   | 8    | 8    |
|          |                              |                  |   |        |                                       | PM <sub>10</sub>  | 11  | 10    | 11   | 10   | 10   |
|          |                              |                  |   |        |                                       | PM <sub>2.5</sub> | 7   | 7     | 7    | 7    | 7    |

*Notes:*

- denotes no data available

\* data for 2020 and 2021 should be treated with caution as they may not be representative of past levels and long-term trends due to the impact of travel restrictions imposed in response to the Covid-19 pandemic on traffic levels (and therefore ambient pollutant concentrations).

- 13.5.21 While no AURN sites are present within the baseline Study Area, background and roadside levels of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> measured at the AURN stations in Chesterfield and Derby indicate that concentrations have been well below the relevant AQOs given in **Table 13.1** over the last five years for which data are available (2020-2024).
- 13.5.22 The local authorities within the Study Area routinely undertake reviews and assessments of air quality within their administrative boundaries which are reported in the form of Annual Status Reports (ASRs) in accordance with the Environment Act 1995 (Ref 13.2). A review has been undertaken of the most recently published ASRs for each of the local authorities within the Study Area.
- 13.5.23 Monitoring of air pollutant levels is undertaken throughout the Study Area using passive samplers and the measurements are summarised below in **Table 13.14**. The latest local authority data available for all local authorities within the Study Area are for 2023 and are taken as being representative of levels in 2025 as trend analysis indicates that concentrations of air pollutants are falling over time and therefore 2023 data can be taken to be representative of 'worst case' levels. Where local authorities (including AVBC (Ref 13.69), CBC (Ref 13.70), DCC (Ref 13.71), EBC (Ref 13.72) and SDDC (Ref 13.73)) have recently provided data for 2024, these have been included, where appropriate, for completeness.
- 13.5.24 The 2023 monitored annual mean NO<sub>2</sub> concentrations have not exceeded the AQO of 40 µg/m<sup>3</sup> and a general five year trend from 2019 to 2023 indicates that annual mean NO<sub>2</sub> levels have decreased steadily within the Study Area as summarised below.
- 13.5.25 Defra's LAQM TG(22) (Ref 13.13) indicates that where annual mean roadside concentrations are above 60 µg/m<sup>3</sup> there is the potential for exceedances of the short-term (1-hour mean) objective of 200 µg/m<sup>3</sup>. Based on the review of available local authority monitoring data within the baseline air quality Study Area, summarised in **Table 13.15** below, the hourly mean NO<sub>2</sub> objective is not anticipated to be exceeded.

### **Local authority air quality monitoring data**

#### **Amber Valley Borough Council**

- 13.5.26 Prior to 2024, routine air quality monitoring was not undertaken by AVBC (Ref 13.54). However, results from the council's air quality modelling study, undertaken in 2023, predicted the potential for exceedances of the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> along the A61 Chesterfield Road in Alfreton considering the higher proportions of HGV movements along this road when compared to other roads within AVBC's administrative area. Consequently, the council commenced NO<sub>2</sub> monitoring using passive diffusion tubes at 12 locations throughout its administrative area in 2024. Provisional monitoring results for 2024 indicate that NO<sub>2</sub> levels measured at diffusion tube 4, which is located along the A61 Chesterfield Road 200 m east of the draft Order Limits, are above the AQO. Final corrected data are anticipated to be published as part of their 2025 ASR (which is pending publication).

### Bolsover District Council

- 13.5.27 A review of BDC's 2024 ASR (Ref 13.55) indicates that the council does not undertake routine air quality monitoring of NO<sub>2</sub> within the Study Area, therefore baseline conditions have been derived from monitoring data collected within BDC's wider administrative area. This has revealed that there have been no exceedances of the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> over the last five years for which data are available (2019-2023). The maximum concentration measured over this time has been of 37.9 µg/m<sup>3</sup> (at diffusion tube 30) in 2019; NO<sub>2</sub> levels are generally seen to be improving over time.

### Chesterfield Borough Council

- 13.5.28 Continuous monitoring of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> is not undertaken by CBC in the Study Area (Ref 13.56). However, monitoring of NO<sub>2</sub> using passive diffusion tubes is undertaken at eight roadside locations within the Study Area. The annual mean NO<sub>2</sub> concentrations at these locations have reduced steadily and have not exceeded the AQO of 40 µg/m<sup>3</sup> over the last five (2019-2023) years.
- 13.5.29 The 2023 annual mean roadside NO<sub>2</sub> concentration measured at diffusion tube 2, located along the A632 off the A61, which is likely to be used by construction vehicles, was 24.8 µg/m<sup>3</sup>. Similarly, annual mean NO<sub>2</sub> concentrations measured at roadside diffusion tube 32, located off the A617, range from 30.5 µg/m<sup>3</sup> in 2019 falling to 23.4 µg/m<sup>3</sup> in 2023. While concentrations measured at tube 25 and 32 have decreased over the last five years, levels at other monitoring locations in 2023 are broadly consistent with those in 2019 demonstrating little change. Notwithstanding this, the data indicate that air quality in terms of NO<sub>2</sub> at roadside locations along the A61 and A617 are good, as they are elsewhere.

### Derby City Council

- 13.5.30 Derby City Council undertakes routine monitoring of NO<sub>2</sub> using passive diffusion tubes at 79 locations within its administrative area; seventeen roadside diffusion tubes are located within the Study Area (Ref 13.57). The 2023 annual mean NO<sub>2</sub> concentrations measured at these locations ranged from 11.9 µg/m<sup>3</sup> to 37.0 µg/m<sup>3</sup> and as such the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> was not exceeded over the five years from 2019 to 2023, indicating good compliance with the AQO. Furthermore, annual mean NO<sub>2</sub> concentrations measured at all diffusion tubes present within the Study Area have decreased over the last five years.
- 13.5.31 Measured roadside concentrations of annual mean NO<sub>2</sub> along the A52 have been below the AQO of 40 µg/m<sup>3</sup> over the five-year period from 2019 to 2023, which is consistent with the council's revocation of AQMA No.2 in November 2024.

### Erewash Borough Council

- 13.5.32 Routine monitoring of NO<sub>2</sub> using passive diffusion tubes is undertaken at 25 locations within EBC's administrative area (Ref 13.58); none are located within the Study Area.
- 13.5.33 A review of data for 2019-2023 shows that the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> was not breached at any of the monitoring locations and the data show a downward trend in annual mean NO<sub>2</sub> concentrations, i.e., levels are reducing. The maximum concentration over the five-year period from 2019 to 2023 was 36.9 µg/m<sup>3</sup> measured at kerbside diffusion tube EBC/1 approximately 3.9 km east of the draft Order Limits.

### North East Derbyshire District Council

- 13.5.34 North East Derbyshire District Council undertakes NO<sub>2</sub> monitoring using diffusion tubes at 16 locations; six are located within the Study Area (Ref 13.59). Recent (2019-2023) monitoring results have indicated that the annual mean NO<sub>2</sub> objective of 40 µg/m<sup>3</sup> was not exceeded and the general trend indicates that post-Covid-19 NO<sub>2</sub> concentrations (2022, 2023) are lower than pre-Covid-19 NO<sub>2</sub> concentrations (2019) indicating an improvement in air quality.
- 13.5.35 Measured roadside concentrations of NO<sub>2</sub> along the roads likely to be used by construction vehicles, like the A632, were consistently below the AQO of 40 µg/m<sup>3</sup> from 2019 to 2023.

### South Derbyshire District Council

- 13.5.36 Annual mean NO<sub>2</sub> concentrations are monitored at 24 locations by SDDC using diffusion tubes (Ref 13.60). Six diffusion tubes are present within the Study Area; annual mean NO<sub>2</sub> concentrations measured at these monitoring locations have decreased over the last five (2019-2023) years and the AQO of 40 µg/m<sup>3</sup> has not been exceeded.

**Table 13.15: Summary of local authority monitoring data within the baseline air quality Study Area**

| Site ID <sup>†</sup>                | Site Name               | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |        |
|-------------------------------------|-------------------------|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|--------|
|                                     |                         |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024   |
| <b>Amber Valley Borough Council</b> |                         |                        |                                       |  |        |  |       |       |      |      |        |
| 2                                   | A6 Chapel Street        | Roadside               | 1.9                                   | 434684   | 347225 | -  | -     | -     | -    | -    | 19.5** |
| 4 <sup>‡</sup>                      | A61 Chesterfield Road   | Roadside               | 0.2                                   | 440931   | 355829 | -  | -     | -     | -    | -    | 58.3** |
| 5 <sup>‡</sup>                      | A61 King Street         | Roadside               | 0.3                                   | 440864   | 355517 | -  | -     | -     | -    | -    | 26.1** |
| 6                                   | Birchwood Road          | Roadside               | 1.6                                   | 442164   | 355096 | -  | -     | -     | -    | -    | 16.5** |
| 11                                  | Grosvenor Road          | Roadside               | 1.3                                   | 439966   | 350514 | -  | -     | -     | -    | -    | 23.4** |
| 12                                  | B6179 Church Street     | Roadside               | 1.3                                   | 439984   | 350588 | -  | -     | -     | -    | -    | 24.4** |
| <b>Chesterfield Borough Council</b> |                         |                        |                                       |  |        |  |       |       |      |      |        |
| 2                                   | Bridge Inn, Hollis Lane | Roadside               | 1.9                                   | 438710   | 370950 | 24.9   | 22.7  | 22.9  | 25.5 | 24.8 | 28.0   |
| 8                                   | 212 Derby Road          | Roadside               | 2.0                                   | 438395   | 369776 | 24.3   | 23.0  | 23.9  | 23.4 | 25.3 | 23.2   |
| 9                                   | 287 Derby Road          | Roadside               | 2.0                                   | 438385   | 369574 | 23.2   | 21.3  | 23.1  | 21.7 | 22.7 | 24.6   |

| Site ID <sup>†</sup>      | Site Name                  | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |      |
|---------------------------|----------------------------|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|------|
|                           |                            |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024 |
| 13                        | 10 Calow Lane              | Roadside               | 0.8                                   | 439780   | 369440 | 19.4   | 18.1  | 17.2  | 17.2 | 17.1 | 18.2 |
| 23                        | 29 Mansfield Road          | Roadside               | 0.7                                   | 439830   | 369320 | 22.4   | 20.4  | 19.7  | 19.8 | 18.1 | 17.0 |
| 25                        | J+S Trophies, The Green    | Roadside               | 0.9                                   | 439490   | 369608 | 29.0   | 26.9  | 27.3  | 27.4 | 26.7 | 26.3 |
| 32 <sup>‡</sup>           | Warner Street              | Roadside               | 1.4                                   | 438976   | 370356 | 30.5   | 28.6  | 27.8  | 26.6 | 23.4 | 24.7 |
| 36                        | Lite Bites, Mansfield Road | Roadside               | 0.8                                   | 439710   | 369420 | 24.6   | 22.8  | 23.3  | 20.1 | 17.8 | 20.7 |
| <b>Derby City Council</b> |                            |                        |                                       |  |        |  |       |       |      |      |      |
| KL1 <sup>‡</sup>          | 10 Kirkleys Avenue North   | Roadside               | 1.9                                   | 440206   | 335650 | 24.0   | 19.4  | 20.0  | 19.7 | 18.7 | 17.2 |
| KL2 <sup>‡</sup>          | 27 Kirkleys Avenue South   | Roadside               | 2.0                                   | 440198   | 335611 | 21.0   | 16.7  | 18.3  | 17.1 | 16.5 | 15.7 |
| NR1 <sup>‡</sup>          | 24 Nottingham Road         | Roadside               | 2.4                                   | 439899   | 335348 | 37.0   | 32.2  | 35.4  | 31.9 | 31.0 | 30.7 |
| NS1 <sup>‡</sup>          | 32 Newdigate Street        | Roadside               | 3.8                                   | 435091   | 333526 | 31.0   | 25.6  | 34.0  | 29.4 | 28.8 | 27.0 |

| Site ID <sup>†</sup> | Site Name              | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |      |
|----------------------|------------------------|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|------|
|                      |                        |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024 |
| NS2 <sup>‡</sup>     | 80 Newdigate Street    | Roadside               | 3.9                                   | 435022   | 333581 | 33.0   | 29.2  | 33.6  | 31.1 | 30.3 | 26.9 |
| OPR1 <sup>‡</sup>    | 523 Osmaston Park Road | Roadside               | 3.3                                   | 436809   | 332826 | 27.0   | 20.6  | 23.1  | 21.2 | 20.3 | 21.7 |
| OPR2 <sup>‡</sup>    | 104 Osmaston Park Road | Roadside               | 3.7                                   | 435716   | 333327 | 37.0   | 29.5  | 33.6  | 31.4 | 30.2 | 25.2 |
| OR1 <sup>‡</sup>     | 831 Osmaston Road      | Roadside               | 3.1                                   | 436992   | 332713 | 24.0   | 19.9  | 22.1  | 22.0 | 20.0 | 20.2 |
| SR1 <sup>‡</sup>     | 1 Station Road         | Roadside               | 2.4                                   | 439789   | 335412 | 29.0   | 21.9  | 24.8  | 20.2 | 19.2 | 20.3 |
| UNR2 <sup>‡</sup>    | 414 Uttoxeter New Road | Roadside               | 5.8                                   | 433190   | 335380 | 27.0   | 21.9  | 22.6  | 21.9 | 21.0 | 16.5 |
| UNR3 <sup>‡</sup>    | 431 Uttoxeter New Road | Roadside               | 5.8                                   | 433186   | 335327 | 27.0   | 21.9  | 23.2  | 20.2 | 21.2 | 19.4 |
| UNR4 <sup>‡</sup>    | 266 Uttoxeter New Road | Roadside               | 6.1                                   | 433786   | 335778 | 36.0   | 27.8  | 31.7  | 29.3 | 31.4 | 26.9 |
| UNR5 <sup>‡</sup>    | 199 Uttoxeter New road | Roadside               | 6.1                                   | 433887   | 335804 | 32.0   | 27.1  | 29.7  | 26.4 | 27.2 | 25.3 |

| Site ID <sup>†</sup>                          | Site Name                                 | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |      |
|---|---|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|------|
|   |   |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024 |
| UOR1 <sup>‡</sup>                             | 208 Uttoxeter Old Road                    | Roadside               | 6.2                                   | 433877   | 335850 | 28.0   | 23.5  | 24.0  | 23.6 | 22.4 | 22.0 |
| AIS1  | Alvaston Infant School, Elvaston Lane     | Roadside               | 1.9                                   | 439020   | 333134 | -  | -     | -     | -    | 13.5 | 12.6 |
| BWP1  | Borrow Wood Primary School, Arundel Drive | Roadside               | 1.3                                   | 440734   | 336067 | -  | -     | -     | -    | 11.9 | 8.4  |
| TBS1 <sup>‡</sup>                             | The Bemrose School, Rowditch Avenue       | Roadside               | 6.0                                   | 433734   | 335694 | -  | -     | -     | -    | 17.4 | 19.1 |
| <b>North East Derbyshire District Council</b> |   |                        |                                       |  |        |  |       |       |      |      |      |
| 6 <sup>‡</sup>                                | 5 Glebe Close                             | Suburban               | 0.7                                   | 442718   | 365779 | 18.3   | 13.2  | 14.9  | 15.2 | 14.3 | -    |
| 24  | 304 North Wingfield Road                  | Roadside               | 1.5                                   | 440708   | 366629 | 18.4   | 12.9  | 16.2  | 15.6 | 13.9 | -    |
| 27 <sup>‡</sup>                               | Traffic Light, outside Aingarth           | Roadside               | 3.4                                   | 444542   | 371254 | 38.3   | 23.6  | 26.3  | 25.5 | 24.9 | -    |
| 20, 72, 73                                    | 26 Top Road                               | Roadside               | 0.5                                   | 440869   | 370912 | 25.6   | 18.4  | 23.4  | 22.4 | 21.8 | -    |

| Site ID <sup>†</sup>                     | Site Name                                  | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |      |
|--|--|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|------|
|  |  |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024 |
| 74 <sup>‡</sup>                          | 1 The Poplars, Chesterfield Road           | Urban Background       | 2.5                                   | 443555   | 371305 | -  | 11.3  | 13.4  | 13.3 | 12.1 | -    |
| 76 <sup>‡</sup>                          | 3 Manor Farm Mews, Chesterfield Road       | Roadside               | 3.4                                   | 444504   | 371267 | -  | 16.3  | 18.0  | 16.8 | 16.9 | -    |
| <b>South Derbyshire District Council</b> |  |                        |                                       |  |        |  |       |       |      |      |      |
| SDDC12                                   | Lamp post, 32 High Street                  | Roadside               | 1.7                                   | 430494   | 326810 | 18.1   | 13.9  | 14.8  | 15.2 | 13.9 | 13.1 |
| SDDC13                                   | Lamp post, 35/37 High Street               | Kerbside               | 1.7                                   | 430508   | 326810 | 17.2   | 14.4  | 15.0  | 15.1 | 15.7 | 13.2 |
| SDDC14                                   | Road sign, The Priory, High Street         | Roadside               | 1.6                                   | 430444   | 326888 | 27.7   | 21.1  | 24.0  | 24.5 | 21.1 | 21.4 |
| SDDC15                                   | Road sign, 2 Woods Meadow, Chellaston Lane | Roadside               | 0.6                                   | 439886   | 332070 | -  | -     | 16.3  | 16.2 | 15.8 | 14.1 |

| Site ID <sup>†</sup> | Site Name  | Site Type <sup>†</sup> | Distance from Draft Order Limits (km) | Site Coordinates (Based on OS Grid Reference, m) |        | Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |       |       |      |      |      |
|----------------------|--|------------------------|---------------------------------------|--|--------|--|-------|-------|------|------|------|
|                      |  |                        |                                       | X  | Y      | 2019   | 2020* | 2021* | 2022 | 2023 | 2024 |
| SDDC22               | Lamppost on Wragley Way, adj 12 Silverton Drive  | Roadside               | 1.2                                   | 433236   | 330729 | -  | -     | -     | 19.1 | 17.2 | 18.5 |
| SDDC23               | Lamppost on Wragley Way, adj to 46 Deepdale Lane | Kerbside               | 0.8                                   | 434558   | 330471 | -  | -     | -     | 15.9 | 14.9 | 13.3 |

Notes:

- denotes no data available

<sup>†</sup> data obtained from respective local authority air quality annual status report; all other data provided by personal communication.

\* data for 2020 and 2021 should be treated with caution as they may not be representative of past levels and long-term trends due to the impact of travel restrictions imposed in response to the Covid-19 pandemic on traffic levels (and therefore ambient pollutant concentrations).

\*\* provisional unpublished data.

‡ denotes monitoring site present within 200 m of the preliminary affected road network for construction traffic (see section 13.7).

## Pollution climate mapping model data

### Roadside air quality data

- 13.5.37 As part of the UK’s statutory reporting, Defra undertakes a range of air pollutant modelling at different spatial scales, one of which is the PCM model. The PCM model (Ref 13.46) is used to provide projections of roadside pollutant concentrations adjacent to approximately 9,000 road links throughout the UK to enable an assessment of compliance with relevant limit values to be made.
- 13.5.38 Defra’s PCM model provides estimates of 2023 roadside NO<sub>2</sub> concentrations for 84 road links (composed of nine unique links) in the Study Area. The maximum concentration for each PCM road link present within the Study Area (listed by local authority administrative area<sup>15</sup>) is given in **Table 13.16**.

**Table 13.16: Predicted 2023 PCM roadside annual mean NO<sub>2</sub> concentrations for roads within the Study Area**

| Road Name                                     | Census Point ID | Maximum Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> ) |
|---|-----------------|--|
| <b>Amber Valley Borough Council</b>           |                 |  |
| A608  | 802047370       | 12.5   |
| <b>Chesterfield District Council</b>          |                 |  |
| A617  | 802057387       | 28.6   |
| <b>Derby City Council</b>                     |                 |  |
| A6005   | 802047796       | 18.4   |
| A608  | 802037405       | 15.5   |
| A6096   | 802008227       | 17.3   |
| A61   | 802028014       | 23.5   |
| <b>Erewash Borough Council</b>                |                 |  |
| A6005   | 802047796       | 18.4   |
| A6005   | 802073355       | 14.1   |
| A6005   | 802077304       | 14.5   |
| <b>North East Derbyshire District Council</b> |                 |  |
| A6175   | 802084102       | 16.9   |

- 13.5.39 The data in **Table 13.17** show that roadside annual mean NO<sub>2</sub> concentrations for PCM links within the Study Area are all below the annual mean AQO of 40 µg/m<sup>3</sup>.
- 13.5.40 While not required for the compliance risk assessment, roadside PM<sub>10</sub> and PM<sub>2.5</sub> levels are well below the AQOs of 40 µg/m<sup>3</sup> and 20 µg/m<sup>3</sup>, respectively.

<sup>15</sup> Not all local authorities in the study area have PCM road links located within their administrative areas.

## Background air quality data

- 13.5.41 **Table 13.17** displays the arithmetic mean, minimum and maximum of modelled annual mean background pollutant concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> within the Study Area (Ref 13.19) for 2023, 2024 and 2025. 2023 represents the latest year for which PCM predicted roadside concentrations and local authority monitoring data are available; 2024 represents the latest year for which Defra AURN monitoring data are available; and 2025 represents the current assessment year.

**Table 13.17: Modelled Defra background concentrations for the Study Area for 2023, 2024 and 2025**

| Year | Average (Minimum - Maximum) Annual Mean Concentration (µg/m <sup>3</sup> ) |                  |                    |                   |
|------|--|------------------|--------------------|-------------------|
|      | NO <sub>x</sub>  | NO <sub>2</sub>  | PM <sub>10</sub>   | PM <sub>2.5</sub> |
| 2023 | 10.9 (7.4 - 20.6)  | 8.5 (5.9 - 15.0) | 12.5 (10.5 - 16.3) | 6.8 (6.2 - 8.3)   |
| 2024 | 10.6 (7.2 - 19.9)  | 8.2 (5.7 - 14.6) | 12.4 (10.4 - 16.3) | 6.8 (6.2 - 8.3)   |
| 2025 | 10.2 (7.0 - 19.4)  | 8.0 (5.6 - 14.3) | 12.3 (10.4 - 16.2) | 6.7 (6.1 - 8.2)   |

- 13.5.42 Background concentrations of NO<sub>2</sub> and PM<sub>10</sub> are consistent with the 2024 levels reported in **Table 13.14** and are generally low within the Study Area, which is under half of the limit value of 40 µg/m<sup>3</sup> for both pollutants.
- 13.5.43 The background NO<sub>x</sub> concentrations (relevant to ecological receptors) are also generally low within the Study Area. The average 2024 NO<sub>x</sub> concentration across the Study Area is 10.5 µg/m<sup>3</sup> which falls below the critical level for the protection of vegetation of 30 µg/m<sup>3</sup>.
- 13.5.44 Concentrations of PM<sub>2.5</sub> are also comfortably below the relevant limit value (20 µg/m<sup>3</sup>) and are predicted to comply with the interim target values of 12 µg/m<sup>3</sup> and 10 µg/m<sup>3</sup> to be achieved by 2028 and 2040, respectively (see **Table 13.1**).
- 13.5.45 **Table 13.18** below shows the NH<sub>3</sub> critical level and concentration, nitrogen deposition rates and critical loads relevant to the assessment of air quality effects upon ecological sensitive receptors identified within the Study Area.

**Table 13.18: Ammonia critical level and concentration, nitrogen deposition rates and critical loads for the ecological sites within the Study Area**

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |   |  |  |
|---|---|---|--|--|
|   | Ammonia Critical Level ( $\mu\text{g}/\text{m}^3$ )*                                | Nitrogen Deposition Critical Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia Concentration ( $\mu\text{g}/\text{m}^3$ ) | Range of Nitrogen Deposition Rates (kg N/ha/yr) <sup>2</sup> |
| <b>Breadsall Railway Cutting SSSI</b>                           |   |   |  |  |
| 438500, 339500  | 1 or 3  | 10 - 15   | 1.73   | 16.26 - 30.10  |
| 439500, 339500  | 1 or 3  | 10 - 15   | 1.66   | 16.01 - 29.67  |
| <b>Morley Brick Pits SSSI</b>                                   |   |   |  |  |
| 438500, 341500  | 1 or 3  | 10 - 15   | 1.61   | 16.14 - 29.77  |
| <b>Breadsall Railway Cutting LNR</b>                            |   |   |  |  |
| 438500, 339500  | 1 or 3  | 10 - 15   | 1.73   | 16.26 - 30.10  |
| <b>Chellaston Brickworks LNR</b>                                |   |   |  |  |
| 438500, 330500  | 1 or 3  | 10 - 15   | 1.66   | 14.84 - 28.03  |
| 438500, 329500  | 1 or 3  | -   | 1.64   | 14.78 - 27.89  |
| <b>Oakerthorpe LNR</b>  |   |   |  |  |
| 439500, 355500  | 1 or 3  | 10 - 15   | 1.69   | 17.36 - 31.08  |
| <b>Williamthorpe LNR</b>  |   |   |  |  |
| 442500, 367500  | 1 or 3  | -   | 1.54   | 16.60 - 29.67  |
| 443500, 367500  | 1 or 3  | -   | 1.55   | 16.60 - 29.71  |
| 443500, 366500  | 1 or 3  | 10 - 15   | 1.54   | 16.78 - 29.98  |
| 442500, 366500  | 1 or 3  | 10 - 15   | 1.53   | 16.80 - 29.99  |

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |  |   |   |
|---|---|--|---|---|
|   | Ammonia Critical<br>Level ( $\mu\text{g}/\text{m}^3$ )*                             | Nitrogen Deposition Critical<br>Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia<br>Concentration ( $\mu\text{g}/\text{m}^3$ ) | Range of Nitrogen Deposition<br>Rates (kg N/ha/yr) <sup>2</sup> |
| <b>Alfreton Park LWS</b>  |   |  |   |   |
| 440500, 355500  | 1 or 3  | 10 - 15  | 1.68  | 17.22 - 30.84   |
| 439500, 355500  | 1 or 3  | 10 - 15  | 1.69  | 17.36 - 31.08   |
| <b>Arkwright Town Railway LWS</b>                               |   |  |   |   |
| 442500, 370500  | 1 or 3  | 10 - 15  | 1.50  | 16.11 - 28.92   |
| 443500, 370500  | 1 or 3  | 10 - 15  | 1.58  | 16.11 - 28.98   |
| 443500, 380500  | 1 or 3  | 10 - 15  | 1.24  | 14.10 - 25.66   |
| <b>Arleston Canal and Pond LWS</b>                              |   |  |   |   |
| 433500, 329500  | 1 or 3  | -  | 1.82  | 15.41 - 29.08   |
| 434500, 329500  | 1 or 3  | 10 - 15  | 1.79  | 15.27 - 28.82   |
| <b>Booth's Wood and Brook LWS</b>                               |   |  |   |   |
| 437500, 345500  | 1 or 3  | 10 - 15  | 1.71  | 16.83 - 30.75   |
| 436500, 345500  | 1 or 3  | 10 - 15  | 1.76  | 17.22 - 31.37   |
| <b>Breadsall Disused Railway LWS</b>                            |   |  |   |   |
| 437500, 339500  | 1 or 3  | 10 - 15  | 1.78  | 16.51 - 30.52   |
| 438500, 339500  | 1 or 3  | 10 - 15  | 1.73  | 16.26 - 30.10   |
| <b>Broadoak Plantation LWS</b>                                  |   |  |   |   |
| 439500, 353500  | 1 or 3  | 10 - 15  | 1.64  | 17.18 - 30.95   |

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |  |                                  |   |
|---|---|--|----------------------------------|---|
|   | Ammonia Critical<br>Level (µg/m³)*  | Nitrogen Deposition Critical<br>Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia<br>Concentration (µg/m³) | Range of Nitrogen Deposition<br>Rates (kg N/ha/yr) <sup>2</sup> |
| <b>Brown's Lane Meadows LWS</b>                                 |   |  |                                  |   |
| 437500, 345500  | 1 or 3  | 10 - 15  | 1.71                             | 16.83 - 30.75   |
| 436500, 345500  | 1 or 3  | 10 - 15  | 1.76                             | 17.22 - 31.37   |
| <b>Chellaston Brickworks LWS</b>                                |   |  |                                  |   |
| 438500, 330500  | 1 or 3  | 10 - 15  | 1.66                             | 14.84 - 28.03   |
| 438500, 329500  | 1 or 3  | -  | 1.64                             | 14.78 - 27.89   |
| <b>Church Lane, Morley LWS</b>                                  |   |  |                                  |   |
| 440500, 340500  | 1 or 3  | -  | 1.57                             | 15.74 - 29.16   |
| 439500, 340500  | 1 or 3  | 10 - 15  | 1.62                             | 15.97 - 29.55   |
| <b>Corbriggs Marsh LWS</b>                                      |   |  |                                  |   |
| 441500, 368500  | 1 or 3  | 10 - 15  | 1.51                             | 16.41 - 29.32   |
| <b>Cromford Canal, Lower Hartshay LWS</b>                       |   |  |                                  |   |
| 438500, 351500  | 1 or 3  | -  | 1.73                             | 17.20 - 31.14   |
| <b>Derby Canal, Borrowash LWS</b>                               |   |  |                                  |   |
| 441500, 334500  | 1 or 3  | -  | 1.61                             | 14.88 - 27.95   |
| <b>Dunshill Quarry LWS</b>                                      |   |  |                                  |   |
| 442500, 338500  | 1 or 3  | 10 - 15  | 1.51                             | 15.26 - 28.41   |
| <b>Dunshill Shelterbelt LWS</b>                                 |   |  |                                  |   |
| 441500, 336500  | 1 or 3  | -  | 1.69                             | 15.31 - 28.59   |
| 442500, 337500  | 1 or 3  | 10 - 15  | 1.57                             | 15.25 - 28.41   |

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |  |                                  |   |
|---|---|--|----------------------------------|---|
|   | Ammonia Critical<br>Level (µg/m³)*  | Nitrogen Deposition Critical<br>Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia<br>Concentration (µg/m³) | Range of Nitrogen Deposition<br>Rates (kg N/ha/yr) <sup>2</sup> |
| 441500, 337500  | 1 or 3  | 10 - 15  | 1.61                             | 15.53 - 28.92   |
| 442500, 338500  | 1 or 3  | 10 - 15  | 1.51                             | 15.26 - 28.41   |
| <b>Elvaston Castle Country Park LWS</b>                         |   |  |                                  |   |
| 440500, 332500  | 1 or 3  | 10 - 15  | 1.57                             | 14.62 - 27.63   |
| 441500, 332500  | 1 or 3  | 10 - 15  | 1.54                             | 14.45 - 27.30   |
| 441500, 333500  | 1 or 3  | 10 - 15  | 1.55                             | 14.66 - 27.62   |
| <b>Ferriby Brook and Dam Brook LWS</b>                          |   |  |                                  |   |
| 438500, 339500  | 1 or 3  | 10 - 15  | 1.73                             | 16.26 - 30.10   |
| <b>Holbrook Disused Sewage Works LWS</b>                        |   |  |                                  |   |
| 437500, 344500  | 1 or 3  | 10 - 15  | 1.68                             | 16.65 - 30.47   |
| 436500, 344500  | 1 or 3  | 10 - 15  | 1.72                             | 17.02 - 31.08   |
| <b>Holmewood Meadow LWS</b>                                     |   |  |                                  |   |
| 442500, 366500  | 1 or 3  | 10 - 15  | 1.53                             | 16.80 - 29.99   |
| 443500, 366500  | 1 or 3  | 10 - 15  | 1.54                             | 16.78 - 29.98   |
| <b>Lower Hartshay Wetland LWS</b>                               |   |  |                                  |   |
| 438500, 351500  | 1 or 3  | 5 - 15   | 1.73                             | 17.20 - 31.14   |
| <b>Meadow Farm Meadow LWS</b>                                   |   |  |                                  |   |
| 441500, 358500  | 1 or 3  | 10 - 15  | 1.60                             | 17.35 - 30.89   |
| <b>Millstone Lane Road Verge LWS</b>                            |   |  |                                  |   |
| 439500, 353500  | 1 or 3  | 10 - 15  | 1.64                             | 17.18 - 30.95   |

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |  |                                  |   |
|---|---|--|----------------------------------|---|
|   | Ammonia Critical<br>Level (µg/m³)*  | Nitrogen Deposition Critical<br>Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia<br>Concentration (µg/m³) | Range of Nitrogen Deposition<br>Rates (kg N/ha/yr) <sup>2</sup> |
| 439500, 354500  | 1 or 3  | -  | 1.66                             | 17.27 - 31.02   |
| <b>Oakerthorpe LWS</b>  |   |  |                                  |   |
| 439500, 355500  | 1 or 3  | 10 - 15  | 1.69                             | 17.36 - 31.08   |
| <b>Owlcotes Wood LWS</b>  |   |  |                                  |   |
| 445500, 367500  | 1 or 3  | -  | 1.56                             | 16.61 - 29.79   |
| 444500, 367500  | 1 or 3  | 10 - 15  | 1.55                             | 16.60 - 29.75   |
| <b>River Derwent LWS</b>  |   |  |                                  |   |
| 441500, 333500  | 1 or 3  | 5 - 10   | 1.55                             | 14.66 - 27.62   |
| 441500, 334500  | 1 or 3  | 5 - 10   | 1.61                             | 14.88 - 27.95   |
| <b>Smalley Green Meadow LWS</b>                                 |   |  |                                  |   |
| 440500, 343500  | 1 or 3  | 10 - 15  | 1.58                             | 15.86 – 29.25   |
| <b>Stanley-Morley Disused Railway LWS</b>                       |   |  |                                  |   |
| 442500, 340500  | 1 or 3  | 10 - 15  | 1.51                             | 15.28 - 28.39   |
| 441500, 340500  | 1 or 3  | 5 - 15   | 1.51                             | 15.51 - 28.77   |
| 440500, 340500  | 1 or 3  | -  | 1.57                             | 15.74 - 29.16   |
| <b>The Warren, Coxbench LWS</b>                                 |   |  |                                  |   |
| 437500, 343500  | 1 or 3  | 10 - 15  | 1.66                             | 16.46 - 30.19   |
| <b>Twyford Green Complex LWS</b>                                |   |  |                                  |   |
| 432500, 328500  | 1 or 3  | 10 - 15  | 1.78                             | 15.28 - 28.88   |
| 432500, 329500  | 1 or 3  | 10 - 15  | 1.85                             | 15.56 - 29.34   |

| Ecological Site<br>(OS Grid Reference:<br>X, Y Coordinates (m)) | 2020 – 2022 Average Concentration (Three-Year Average, Based on a Mid-Year of 2021) |  |   |   |
|---|---|--|---|---|
|   | Ammonia Critical<br>Level ( $\mu\text{g}/\text{m}^3$ )*                             | Nitrogen Deposition Critical<br>Load Range (kg N/ha/yr) <sup>1</sup> | Ammonia<br>Concentration ( $\mu\text{g}/\text{m}^3$ ) | Range of Nitrogen Deposition<br>Rates (kg N/ha/yr) <sup>2</sup> |
| <b>Willington Railway Pond No.1 LWS</b>                         |   |  |   |   |
| 430500, 329500  | 1 or 3  | 10 - 15  | 1.90  | 15.98 - 30.04   |
| 430500, 328500  | 1 or 3  | 10 - 15  | 1.85  | 15.68 - 29.56   |
| <b>Willington Railway Pond No.2 LWS</b>                         |   |  |   |   |
| 430500, 329500  | 1 or 3  | 10 - 15  | 1.90  | 15.98 - 30.04   |
| <b>Booths Wood AW</b>   |   |  |   |   |
| 436500, 345500  | 1 or 3  | 10 - 15  | 1.76  | 17.22 - 31.37   |
| <b>Broadoak Plantation AW</b>                                   |   |  |   |   |
| 439500, 353500  | 1 or 3  | 10 - 15  | 1.64  | 17.18 - 30.95   |
| <b>East of Far Lane AW</b>                                      |   |  |   |   |
| 442500, 337500  | 1 or 3  | 10 - 15  | 1.57  | 15.25 - 28.41   |
| <b>Heath Wood AW</b>  |   |  |   |   |
| 444500, 367500  | 1 or 3  | 10 - 15  | 1.55  | 16.60 - 29.75   |
| <b>North of Booth's Wood AW</b>                                 |   |  |   |   |
| 436500, 345500  | 1 or 3  | 10 - 15  | 1.76  | 17.22 - 31.37   |
| <b>Sutton Springs Wood AW</b>                                   |   |  |   |   |
| 442500, 368500  | 1 or 3  | 10 - 15  | 1.53  | 16.43 - 29.42   |

Notes:

- denotes no data reported.

\* The  $\text{NH}_3$  critical level is  $3 \mu\text{g}/\text{m}^3$  unless lichens and bryophytes are known to be present in which case it reduces to  $1 \mu\text{g}/\text{m}^3$ .

<sup>1</sup> The critical load ranges are reported for the most sensitive feature present within the designated site.

<sup>2</sup> The range of nitrogen deposition rates reported is for moorland/short vegetation to forest/tall vegetation.

13.5.46 **Table 13.18** shows that the average NH<sub>3</sub> concentration is above the lower critical level of 1 µg/m<sup>3</sup>. The predicted nitrogen deposition rate exceeds the upper critical load.

**Local emission sources**

13.5.47 A review of permitted industrial sources with relevant emissions to air within 2 km of the draft Order Limits has been undertaken (Ref 13.61, Ref 13.62, Ref 13.63, Ref 13.64, Ref 13.65, Ref 13.66, Ref 13.67, and Ref 13.68). Sixteen<sup>16</sup> Part A1<sup>10</sup> and 30 Part A2/B<sup>11</sup> permitted processes have been identified within the Study Area. A review of the modelled Defra background concentration data shows that away from permitted pollutant sources, industrial emissions do not substantially contribute to dust and air pollutant levels within the Study Area.

13.5.48 A review of the British Geological Survey website (Ref 13.74) indicates that there is one active quarry within the baseline Study Area that could potentially act as a source of fugitive dust and particulate matter emissions.

**Baseline air quality monitoring survey**

13.5.49 A 12-month Project-specific baseline NO<sub>2</sub> monitoring survey is being undertaken to inform the ES using diffusion tubes situated at 20 locations within the draft Order Limits and adjacent to routes which are anticipated to be used by construction vehicles. The monitoring locations are shown in **Figure 13.1**.

13.5.50 Baseline air quality survey results based on the average of data collected from June to October 2025 are given **Table 13.19**. Annualised and bias-adjusted monitoring results, derived in accordance with the guidance given in LAQM TG22 (Ref 13.12), will be presented as part of the ES upon completion of the 12-month baseline monitoring survey. A detailed summary of the baseline monitoring survey methodology is given in **Appendix 13A Baseline Air Quality Monitoring Surveys and Results**.

**Table 13.19: Baseline air quality monitoring survey results (based on data collected from June to October 2025)**

| Site ID | Raw Average Monitored NO <sub>2</sub> Concentration (µg/m <sup>3</sup> , Rounded to One Decimal Place) <sup>17</sup> |
|---------|--|
| 1       | 11.6   |
| 2       | 10.8   |
| 3       | 8.2  |
| 4       | 14.0   |
| 5       | 13.2   |
| 6       | 8.7  |
| 7       | 14.0   |

<sup>16</sup> Of the processes, six were permitted after 2020; these sources are unlikely to be captured in the 2021 Defra background maps.

<sup>17</sup> This represents data which are neither bias-adjusted nor annualised.

| Site ID | Raw Average Monitored NO <sub>2</sub> Concentration (µg/m <sup>3</sup> , Rounded to One Decimal Place) <sup>17</sup> |
|---------|--|
| 8       | 13.6   |
| 9       | 11.9   |
| 10      | 11.4   |
| 11      | 22.9   |
| 12      | 10.7   |
| 13      | 20.7   |
| 14      | 18.0   |
| 15      | 14.1   |
| 16      | 15.4   |
| 17      | No data  |
| 18      | 12.9   |
| 19      | 14.4   |
| 20      | 10.5   |

13.5.51 Raw monitored NO<sub>2</sub> concentrations were well below the annual mean AQO of 40 µg/m<sup>3</sup> at all monitoring locations. The maximum concentration measured to date is 22.9 µg/m<sup>3</sup> at diffusion tube ID 11 located on the A615 Wingfield Road in the administrative area of AVBC.

### Summary

13.5.52 Overall, air quality in the Study Area is good, reflecting its rural nature and the limited number of local sources of emissions to air beyond road traffic. The baseline data indicate that within more urbanised areas there are locations where there are existing air quality constraints, such as along the Derby NO<sub>2</sub> AQMA No.1, which while located just outside the baseline Study Area, may need to be considered when developing the Project-specific transport mitigation strategies. This would ensure changes in traffic levels due to construction and worker vehicle movements do not delay improvements in local air quality in future years, and emerging areas of concern, e.g., the A61 Chesterfield Road in Alfreton.

13.5.53 There are no exceedances of the annual mean NO<sub>2</sub> objective in the Defra and local authority monitoring data. Predicted background concentrations within the Study Area are low in comparison to the AQO. The annual mean PM<sub>10</sub> and PM<sub>2.5</sub> levels are also well below the relevant AQOs.

13.5.54 Raw unadjusted baseline monitoring survey results collected between June and October 2025 indicate that NO<sub>2</sub> levels in the Study Area are well below the AQO of 40 µg/m<sup>3</sup>.

13.5.55 The existing predicted NH<sub>3</sub> concentrations and nutrient nitrogen deposition rates are above their respective lower critical level and upper critical load for the designated sites identified within the Study Area.

## Future Baseline

- 13.5.56 This assessment factors known or foreseeable changes to the current baseline year (2025) up to the ‘construction year’ baseline (2029), against which effects of the Project during construction and operation are assessed, to inform the assessment. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be completed prior to construction of the Project.
- 13.5.57 At this preliminary stage, a full assessment of the implications of any committed developments on construction year baseline conditions has not been undertaken. A list of the known developments which are anticipated to be included within the construction year baseline scenario is provided within **Chapter 17 Cumulative Effects**. This will be reviewed and updated as appropriate during development of the ES.
- 13.5.58 Projected background air pollutant concentrations (Ref 13.19) have been used to determine the construction year baseline (2029). Levels of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are predicted to improve over time due to reductions in emissions due to:
- progressive reductions in national emissions including reductions in transport-related pollutants due to improvements in fuel efficiency and the uptake of low and zero emission vehicles;
  - reductions in the use of fossil fuels as a result of the national ban on new petrol and diesel-engine vehicles from 2030 onward (Ref 13.75);
  - reductions in pollutant emissions from agricultural sources due to improvements in management envisaged in the 2019 Clean Air Strategy (Ref 13.25); and
  - improved emission standards for NRMM and static generators.
- 13.5.59 As concentrations of air pollutants are projected to decrease with time, the earlier the assessment year, the higher the projected level of background pollution used in the assessment and the more conservative the predicted concentration.
- 13.5.60 The earliest year by which the Project could potentially be operational is 2031 and construction is predicted to begin in 2029, therefore, 2029 air pollutant data have been used to provide a conservative representation of opening year background concentrations Ref 13.21.
- 13.5.61 The arithmetic mean, minimum and maximum predicted pollutant concentrations for the construction year baseline Study Area for 2029, are shown in **Table 13.20**. There are reductions in all pollutant levels within the Study Area compared to the 2023, 2024 and 2025 forecasts as shown in **Table 13.17**.

**Table 13.20: 2029 Modelled Defra background concentrations within the Study Area**

| Average (Minimum - Maximum) 2029 Annual Mean Concentration (µg/m <sup>3</sup> ) |                  |                    |                   |
|---|------------------|--------------------|-------------------|
| NO <sub>x</sub>   | NO <sub>2</sub>  | PM <sub>10</sub>   | PM <sub>2.5</sub> |
| 8.9 (6.3 - 17.7)  | 7.0 (5.0 - 13.1) | 12.0 (10.1 - 15.9) | 6.4 (5.8 - 7.9)   |

## 13.6 Design Embedded and Good Practice Mitigation Measures

13.6.1 As set out in **Chapter 5 Approach to Preliminary Environmental Information Report**, mitigation measures fall into three categories: design embedded mitigation measures, good practice measures, and additional mitigation measures. Those measures relevant to the assessment of air quality effects are set out below.

### Design Embedded Mitigation Measures

13.6.2 The Project and draft Order Limits have been designed to avoid sensitive (human and ecological) receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 13.76) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 13.77) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 13.78) and **Chapter 3 Main Alternatives Considered**.

### Good Practice Mitigation Measures

13.6.3 A Draft Outline Code of Construction Practice (CoCP) is provided in **Appendix 4A Draft Outline Code of Construction Practice**. The control measures relevant to the air quality assessment for the Project include general site management that, in addition to air quality specific measures, help manage dust and PM<sub>10</sub> emissions associated with the construction phase. These include good site management and control measures as outlined in measures GG02, GG08, GG09, GG10, GG11, GG12, GG14, GG15, GG16, GG17, GG20 and GG21. In addition, landscape measures related to vegetation retention, replacement and working hours as per measures LV02, LV06 and LV07.

13.6.4 Overlapping biodiversity measures include B10: In line with good practice, measures to minimise any risk of effects on ecological features from dust emissions would be informed by the construction dust risk assessment and set out within a Dust Management Plan (DMP) or equivalent. This would include the use of standard dust suppression methods.

13.6.5 Overlapping traffic and transport measures include TT01: For traffic and transport, mitigation measures for the construction phase would be provided in the Outline Construction Traffic Management Plan and an Outline Public Rights of Way Management Plan (PRoWMP), submitted with the DCO application. **Appendix 12B** presents the **Preliminary Public Rights of Way Management Plan**. The extent of specific mitigation measures and their effectiveness would be discussed in advance with relevant stakeholders, and the documents will become more detailed and finalised prior to commencement of construction.

13.6.6 Measures specific to air quality that have been included in the Draft Outline CoCP are given below:

- AQ01: Site management procedures would include the logging of air quality incidents/complaints which would be made available to the relevant local authority when required.
- AQ02: Regular liaison meetings would be held with other high risk construction sites within proximity of the construction work, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. This would include coordination of off-site transport/deliveries which might be using the same Strategic Road Network routes. This will be assessed as part of the cumulative effects assessment in the ES.

- AQ03: Regular site inspections would be conducted to monitor compliance with the DMP with the inspection findings and associated action recorded and tracked. The frequency of site inspections by the person accountable for air quality and dust issues on site would be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- AQ04: The site layout would be planned to ensure that machinery and dust-causing activities are located away from receptors, as far as is possible.
- AQ05: The site and specific operations that give rise to dust would be managed appropriately through project risk assessments where there is a high potential for dust production and the site is active for an extensive period.
- AQ06: Site fencing, barriers and scaffolding would be monitored for dust build up and appropriate action taken if required, for instance kept clean using water.
- AQ07: Materials that have a potential to produce dust would be removed from site as soon as possible, unless they are being re-used on-site. In this case they would be managed appropriately to minimise any adverse effects.
- AQ08: Plant and machinery used would meet the latest emission standards set out in Regulation (EU) 2016/1628 (as amended) where achievable. Construction vehicles would meet Euro VI emission standards which reduce NO<sub>x</sub> and PM<sub>10</sub> emissions. Vehicles/machinery would be properly operated and maintained.
- AQ09: When it is safe to do so, vehicles and plant would switch off engines when stationary and not in use – no idling vehicles and plant.
- AQ10: The use of diesel and petrol-powered machinery and generators would be reviewed and avoided where practicable and mains electricity or battery powered equipment used where practicable. Opportunities to use mains electricity, battery, solar and/or hydrotreated vegetable oil powered equipment would be considered.
- AQ11: To limit any adverse effects of dust whilst travelling along the route, suitable speed limits would be imposed along the route in line with environmental guidance and Project risk assessments.
- AQ12: A Construction Traffic Management Plan (CTMP) would be produced, which would include measures to manage the sustainable delivery of goods and reduce construction traffic movement. An Outline CTMP will be produced as part of the ES.
- AQ13: An adequate water supply would be maintained on-site to ensure there is sufficient supply for effective suppression/mitigation. The use of non-potable water would be considered where possible and appropriate in line with health, safety and environmental considerations.
- AQ14: Dust suppression measures would be employed in both demolition and construction activities, e.g. when using cutting, grinding or sawing equipment, including the use of enclosed chutes, reduced drop heights and water suppression systems, e.g. handheld sprays.
- AQ15: Soft stripping of building interiors would be undertaken before demolition.
- AQ16: Where surface cover would be removed appropriate measures will be explored, where necessary, in liaison with the landowner.

- AQ17: Construction activities would avoid scabbling (roughening) of surfaces where reasonably practicable.
- AQ18: Aggregates would be kept damp where practicable. Fine powder materials would be delivered in enclosed tankers, stored in silos and not overfilled. Small supplies would be transferred into bags which would be stored appropriately and sealed after use.
- AQ19: Trackout (dirt, mud, and construction debris carried onto public areas) measures would be implemented. Wheel washing facilities would be provided where required at compound access points on to the highway. Vehicles shall be kept covered when carrying materials with the potential to cause dust. Access points and the LRN used by the Project, would be managed appropriately to minimise trackout.
- AQ20: Access gates would be located at suitable distance from receptors where possible. Appropriate measures would be provided at access points on to the highway to mitigate the effects of mud on the roads. Cleaning would be deployed to prevent excessive dust or mud deposits. Dry sweeping of large areas would be avoided.
- AQ21: Haul routes would be regularly inspected and repairs instigated. The findings and subsequent actions would be recorded.
- AQ22: Re-routeing of construction traffic, if feasible, would be planned to avoid sensitive receptors, should a significant air quality impact be predicted and/or experienced.
- AQ23: Where possible, on-site emissions to air would be minimised by using prefabricated modular components manufactured off-site.

## 13.7 Preliminary Assessment of Effects

- 13.7.1 The following section presents the findings of the preliminary assessment of effects upon the relevant air quality receptors identified within the Study Area resulting from construction activities.
- 13.7.2 The preliminary assessment of effects reported below considers the good practice mitigation measures previously described.
- 13.7.3 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project. This is particularly relevant to the further assessment of the likely air quality effects of changes in traffic flow due to the Project. A full assessment will be included within the ES submitted as part of the DCO application.

### Likely Significant Effects

#### Construction phase

##### Construction traffic emissions

- 13.7.4 The methodology followed for predicting the construction traffic flows is given in **Chapter 12 Traffic and Transport**. Construction traffic flows (in terms of LGVs and HGVs) have been provided for the current assessment year of 2025 and 2029/2030, which are anticipated to be the busiest periods of vehicle movements; although the peak year varies for different roads that will be used by construction traffic throughout the Project.

- 13.7.5 Initial screening of the projected construction traffic flows against the EPUK/IAQM Planning Guidance (Ref 13.38) change criteria (for human sensitive receptors) and the IAQM Nature Conservation Sites Guidance (Ref 13.19) criteria (for ecological sensitive receptors) has been undertaken. The road links where the criteria are exceeded in Study Area are shown in **Figure 13.3 Preliminary Affected Road Network**.
- 13.7.6 Based on the initial screening, 39 road links which form parts of the A632, A6175, A608, A6005, A61, A615, A609, A5132, A514, A52, A5111, A516 and A617 are expected to exceed the EPUK/IAQM Planning Guidance (Ref 13.38) criteria for human sensitive receptors, these are given in **Table 13.21**. The relevant criteria are:
- a change in LDV flows of more than 500 AADT (outside an AQMA);
  - a change in HDV flows of more than 100 AADT (outside an AQMA);
  - a change in LDV flows of more than 100 AADT (within or adjacent to an AQMA<sup>18</sup>); and/or
  - a change in HDV flows of more than 25 AADT (within or adjacent to an AQMA).
- 13.7.7 The initial screening has also identified 15 road links which exceed the IAQM Nature Conservation Sites Guidance (Ref 13.19) screening criteria for ecological sensitive receptors. The relevant criteria are:
- a change in total traffic flows greater than or equal to equal to 1,000 AADT; and/or
  - a change in HDV flows greater than or equal to 200 AADT.
- 13.7.8 These road links are identified in **Table 13.21** and also exceed the more stringent criteria for human sensitive receptors.
- 13.7.9 At this time, it is anticipated that the detailed assessment within the ES would include identification of the impact and level of significance of the air quality effects for the 39 road links, on human health (of which 15 are also for nature conservation sites). There will be the need for additional mitigation to be implemented to reduce the impact where a significant effect is identified. For all other road links, no significant effects are anticipated as they do not meet the threshold for detailed assessment.
- 13.7.10 The change in vehicle trips due to construction traffic associated with the Project and potential road diversions will be rescreened and assessed for the ES and the outcomes reported. Where the need for detailed modelling is identified, this will be undertaken to determine the potential impact on local air quality.

#### Compliance risk assessment

- 13.7.11 Initial screening of the construction traffic data identified that four roads, which form part of the PCM compliance model assessment, intersect with road links where the change in construction traffic meets the DMRB LA 105 thresholds (Ref 13.42). These would need to be considered to assess the likelihood of whether the change in road traffic flows associated with construction of the Project would lead to an exceedance of the annual mean NO<sub>2</sub> objective. These include the sections of the A61 and A608 north east of Derby near Racecourse Park, the A617 south east of the Horns Bridge roundabout in Chesterfield and parts of the A6005 in Borrowash as shown in **Figure 13.3**. These findings will be reviewed and updated as part of the ES to reflect the latest Project design data in accordance with the DMRB guidance.

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<sup>18</sup> Roads adjacent to an AQMA considers roads within 200 m of an AQMA.

**Table 13.21: Road links exceeding the relevant assessment criteria - construction traffic**

| Link ID | Road Name  | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|--|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |  | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 1-1*    | Chesterfield Road A632 between M1J29A and A632/Sutton Lane                               | 21,225                    | 1,685              | 22,084                    | 1,704              | 22,688                    | 1,967              | 604                                       | 341                                | 263                                |
| 1-4     | Sutton Lane between A632/Sutton Lane and near A617/Shire Lane                            | 1,966                     | 198                | 2,046                     | 201                | 2,539                     | 376                | 493                                       | 318                                | 175                                |
| 1-5     | Slack Lane between near A617/Shire Lane and A6175/Slack Lane Junction                    | 2,242                     | 249                | 2,332                     | 252                | 2,882                     | 427                | 550                                       | 375                                | 175                                |
| 1-6*    | Heath Road A6175 between A6175/Slack Lane Junction and Tibshelf Road/Heath Road Junction | 12,627                    | 1,609              | 13,138                    | 1,627              | 13,699                    | 1,909              | 560                                       | 278                                | 283                                |
| 1-7     | Rupert Street between Tibshelf Road/A6175 and Church Street/Station Road                 | 4,470                     | 256                | 4,651                     | 259                | 4,951                     | 434                | 301                                       | 126                                | 175                                |
| 1-8     | Station Road between Church Street/Station Road and Hardstoft Road/B6039                 | 2,842                     | 268                | 2,957                     | 271                | 3,324                     | 446                | 367                                       | 192                                | 175                                |

| Link ID | Road Name  | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|--|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |  | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 2-2*    | Chesterfield Road A61 between B6025/Chesterfield Road and A61/Eachwell Lane                | 14,202                    | 726                | 14,800                    | 734                | 15,250                    | 894                | 450                                       | 290                                | 160                                |
| 2-4*    | A615 between A615 Road (East of B6013/A615 Junction) and A615/A61                          | 10,877                    | 235                | 11,336                    | 238                | 12,143                    | 558                | 807                                       | 487                                | 320                                |
| 2-7*    | B6013 between Riley Lane/B6016 Junction and Near B6013/Ripley Road Junction                | 3,801                     | 24                 | 3,961                     | 24                 | 4,121                     | 184                | 160                                       | 0                                  | 160                                |
| 3-1     | Heage Road B6374 between Hartshay Hill/A38 Junction and A38/Upper Hartshay Junction        | 6,925                     | 62                 | 7,217                     | 63                 | 7,682                     | 203                | 465                                       | 325                                | 140                                |
| 3-2     | New Road B6013 between Near A38/Upper Hartshay Junction and New Road/Jackson Lane Junction | 5,449                     | 28                 | 5,736                     | 29                 | 5,908                     | 169                | 172                                       | 32                                 | 140                                |

| Link ID | Road Name   | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|---|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |   | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 3-3     | Chesterfield Road B6013 between New Road/Jackson Lane Junction and Near B6013/A609 Junction | 8,463                     | 44                 | 8,909                     | 45                 | 9,081                     | 185                | 172                                       | 32                                 | 140                                |
| 3-4     | Spencer Street A609 between Nottingham Road/Kilbourne Road and Lander Lane/A609             | 5,376                     | 59                 | 5,660                     | 60                 | 5,800                     | 200                | 140                                       | 0                                  | 140                                |
| 3-5*    | Main Street A609 between Lady Lea Road/A609 and Dobholes Lane/A608                          | 8,510                     | 117                | 8,959                     | 119                | 9,406                     | 469                | 448                                       | 98                                 | 350                                |
| 3-6*    | Main Road A608 between A608/Dobholes Lane and A608/Woodside/Ilkest on Road                  | 9,598                     | 860                | 10,104                    | 872                | 10,456                    | 1,222              | 351                                       | 1                                  | 350                                |
| 3-7     | Lady Lea Road between Coxbench Road/Smalley Mill Road and Lady Lea Road/A609                | 2,558                     | 185                | 2,666                     | 187                | 2,877                     | 327                | 211                                       | 71                                 | 140                                |

| Link ID | Road Name  | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|--|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |  | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 4-1*    | A61 between Abbey Hill/Alfreton Road and Wheatcroft Way/A61                            | 41,363                    | 1,208              | 43,091                    | 1,222              | 43,734                    | 1,782              | 643                                       | 83                                 | 560                                |
| 4-2*    | A61 between Wheatcroft Way/A61 and Mansfield Road A608/A61/Hampshire Road              | 25,310                    | 1,660              | 26,403                    | 1,679              | 27,073                    | 2,239              | 670                                       | 110                                | 560                                |
| 4-3*    | Mansfield Road A608 between Mansfield Road and Lime Avenue                             | 15,274                    | 1,135              | 15,934                    | 1,148              | 16,609                    | 1,708              | 675                                       | 115                                | 560                                |
| 4-4*    | Hill Top A608 between Lime Avenue/Mansfield Road Junction and A608/Lime Lane Junction  | 9,365                     | 718                | 9,756                     | 726                | 10,430                    | 1,286              | 675                                       | 115                                | 560                                |
| 4-5*    | Main Road A608 between Near A608/Lime Lane Junction and Near A608/Church Lane Junction | 13,121                    | 990                | 13,669                    | 1,001              | 14,268                    | 1,421              | 599                                       | 179                                | 420                                |

| Link ID | Road Name   | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|---|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |   | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 4-6     | Moor Street between Near Moor Lane/A6096 Junction and Willowcroft Road/A6005 Junction | 11,140                    | 952                | 11,621                    | 962                | 11,828                    | 1,102              | 206                                       | 66                                 | 140                                |
| 5-1*    | A6005 between Willowcroft Road/A6005 Junction and Victoria Avenue/A6005 Junction      | 7,798                     | 575                | 8,124                     | 581                | 8,701                     | 1,061              | 577                                       | 97                                 | 480                                |
| 5-2*    | A6005 between Victoria Avenue/A6005 Junction and Draycott Road/B5010 Junction         | 10,297                    | 749                | 10,727                    | 758                | 11,310                    | 998                | 583                                       | 343                                | 240                                |
| 5-3*    | B5010 between A6005/B5010 Junction and B5010/Ambaston Road Junction                   | 5,113                     | 360                | 5,410                     | 364                | 5,841                     | 604                | 432                                       | 192                                | 240                                |
| 5-4     | B5010 between B5010 and B5010/Derby Road  | 8,270                     | 699                | 8,750                     | 707                | 9,167                     | 867                | 417                                       | 257                                | 160                                |

| Link ID | Road Name   | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|---|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |   | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 6-1     | Swarkestone Road A514 between Swarkestone Road (Near Derby Southern Bypass Roundabout) and A5132/A514 Road Junction | 18,612                    | 241                | 19,967                    | 244                | 21,140                    | 711                | 1,174                                     | 707                                | 467                                |
| 6-2     | Twyford Road A5132 between Swarkestone Road Junction and A5132 Road (Near Rose Cottage)                             | 4,460                     | 247                | 4,784                     | 250                | 5,326                     | 437                | 542                                       | 355                                | 187                                |
| 7-1     | Brian Clough Way A52 between Stoney Lane/A52 and Brian Clough Way/Victoria Avenue                                   | 23,212                    | 548                | 24,182                    | 554                | ND                        | ND                 | ND  | ND                                 | ND                                 |
| 7-2     | Osmaston Park Road A5111 between Balaclava Road/Osmaston Road and Osmaston Road/Peak Drive Junction                 | 24,076                    | 1,832              | 25,116                    | 1,853              | 25,471                    | 1,832              | 355                                       | 376                                | -21                                |

| Link ID | Road Name  | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|--|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |  | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 7-3     | Uttoxeter New Road between Uttoxeter Road/A516 and Uttoxeter Road/Manor Road/Kingsway Road/A516 Junction | 11,966                    | 320                | 12,482                    | 324                | 12,838                    | 320                | 355                                       | 359                                | -4                                 |
| 7-4     | Uttoxeter New Road A516 between B5020/Uttoxeter Road Junction and Kingsway Road/Manor Road Junction      | 43,351                    | 423                | 45,223                    | 428                | 45,578                    | 423                | 355                                       | 360                                | -5                                 |
| 8-1*    | A617 between A61/A617 Junction and A617/Hasland Road Junction  | 48,373                    | 19,916             | 50,356                    | 20,140             | 50,760                    | 19,916             | 404                                       | 628                                | -224                               |
| 8-2     | Harvey Road between Harvey Road/Osmaston Road Junction and Harvey Road/Shardlow Road Junction            | 26,094                    | 884                | 27,221                    | 894                | 27,504                    | 884                | 283                                       | 293                                | -10                                |
| 8-3     | Osmaston Road A514 between Osmaston Road/Ascot Drive Junction and Harvey Road/Osmaston Road Junction     | 17,299                    | 371                | 18,046                    | 375                | 18,401                    | 371                | 355                                       | 360                                | -4                                 |

| Link ID | Road Name  | Baseline                  |                    | Do Minimum                |                    | Do Something              |                    | Change in AADT Flows (Total Vehicles/Day) | Change in LDV Flows (Vehicles/Day) | Change in HDV Flows (Vehicles/Day) |
|---------|--|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---|------------------------------------|------------------------------------|
|         |  | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) | AADT (Total Vehicles/Day) | HDV (Vehicles/Day) |   |                                    |                                    |
| 8-4     | Chellaston Road A514 between Chellaston Road/Boulton Lane Road and Chellaston Road/Carlton Avenue Junction | 14,351                    | 98                 | 14,971                    | 100                | 15,327                    | 98                 | 355                                       | 357                                | -1                                 |
| 8-5     | Osmaston Park Road A5111 between Elton Road/Osmaston Park Road Junction and Moor Lane/A5111 Junction       | 22,331                    | 342                | 23,295                    | 346                | 23,650                    | 342                | 355                                       | 359                                | -4                                 |
| 9-1     | Kingsway between A38/Kingsway Roundabout and Kingsway Boulevard/Kingsway Junction                          | 18,050                    | 326                | 18,829                    | 330                | 19,205                    | 420                | 376                                       | 286                                | 90                                 |
| 9-2     | Kingsway between Kingsway Boulevard/Kingsway Road Junction and Uttoxeter Road/Kingsway Road Junction       | 0                         | 0                  | 0                         | 0                  | 376                       | 93                 | 376                                       | 283                                | 93                                 |

*Notes:*

\* denotes a road link where the change in construction traffic flows meets the IAQM Nature Conservation Sites Guidance thresholds.

ND denotes no data.

The traffic data survey locations have different start and end points. Please refer to **Chapter 12 Traffic and Transport** for further details.

All traffic data presented in the table have been rounded to the nearest whole number.

- 13.7.12 Human and ecological sensitive receptors adjacent to road links where the projected change in traffic flows due to construction of the Project do not exceed the EPUK/IAQM Planning Guidance (Ref 13.38) and IAQM Nature Conservation Sites Guidance (Ref 13.19) criteria have been screened out of any further assessment because significant effects are not likely at these locations.
- 13.7.13 Finalised traffic projections produced in support of the ES will be rescreened to confirm that changes in traffic flows due to construction of the Project exceed the relevant criteria. Where this is the case, a detailed assessment involving dispersion modelling will be undertaken and reported in the ES, based upon the methodology set out in section 13.4.
- 13.7.14 It is noted that vehicle movements during construction of the Project will vary throughout the construction programme, with relatively short peaks in LDV and HDV movements, associated with workforce travel and the import/export of construction materials respectively.
- 13.7.15 Notwithstanding, at receptors adjacent to those road links identified in **Table 13.21**, significant effects due to changes in air quality cannot be ruled out at this stage, in the absence of detailed dispersion modelling results.

### Operational phase

- 13.7.16 The operational phase is unlikely to lead to adverse impacts on sensitive (human and ecological) receptors; **no significant effects** are anticipated.

## Likely Non-Significant Effects

### Construction phase

#### Construction dust

- 13.7.17 **Figure 13.2 Construction Dust Study Area** shows the construction dust Study Area.
- 13.7.18 The construction activities associated with the Project are described in **Chapter 4 Description of the Project**. Those that have the potential to generate and/or re-suspend dust and PM<sub>10</sub> include:
- site surveys and preparation;
  - enabling works, including localised utility works and ground investigations;
  - establishment of temporary access/egress to the site and haul roads;
  - establishment of construction compounds;
  - earthworks, including the groundworks (soil stripping and excavation for pylon foundations);
  - materials handling, storage, stockpiling and disposal;
  - construction of foundations and substation aprons;
  - construction of buildings, roads and areas of hardstanding alongside fabrication processes;

- exhaust emissions from site plant and NRMM, especially when used at the extremes of their capacity and during mechanical breakdown;
- pylon assembly;
- establishment of scaffolding and crossing protection;
- conductor stringing;
- demobilisation of construction compounds and temporary accesses; and
- site reinstatement.

13.7.19 The majority of the dust releases during construction are likely to occur during construction activities that are undertaken in the ‘working week’, which is taken to be:

- For overhead line works:
  - Monday to Friday: 7am to 7pm; and
  - Saturdays, Sundays and bank holidays: 8am to 5pm.
- For Chesterfield Substation:
  - Monday to Friday: 7am to 7pm; and
  - Saturdays: 8am to 1pm.

13.7.20 Typical activities that fall outside these hours are given in **Chapter 4 Description of the Project**.

13.7.21 However, for some potential release sources (e.g. exposed soil stockpiles), in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day, seven days per week, until such works are complete and areas reinstated.

13.7.22 The construction dust assessment methodology adopts a worst-case approach and treats all receptors within the Study Area consistently. There will however be considerable variation in the magnitude of dust emissions throughout the construction phase depending on specific construction activities being undertaken at any one time. This includes, for example, variation in the number of vehicles throughout the construction programme, which will affect the trackout of dust emissions.

13.7.23 Therefore, the risk of impacts to local amenity will vary throughout construction and will be greater during certain periods (e.g. during the peak of earthwork activities) and times of the year (e.g. prolonged dry spells). Several receptors within the Study Area will also be influenced by construction activities for shorter periods than others. For example, a sensitive receptor location in proximity to a pylon location is likely to experience impacts for a shorter period than a receptor in proximity to the substation sites. This is due to the greater scale and duration of construction activities associated with the substation relative to the activities required to install the new overhead line. This assessment will be refined further as more detail is available in the ES submitted as part of the DCO application.

## Assessment of potential dust emission magnitude

- 13.7.24 The IAQM Construction Dust Guidance (Ref 13.23) assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM<sub>10</sub> sources: demolition, earthworks, construction and trackout. The findings of the assessment are presented below.

### Demolition

- 13.7.25 Demolition works within the Study Area will be limited to localised enabling works to existing electricity supply infrastructure that would be crossed by the proposed route alignment. To facilitate the new overhead line, this is anticipated to include the removal of existing poles and pylons over short sections of existing line to be replaced by underground cable. Demolition activities would also be associated with the construction of the Chesterfield substation.
- 13.7.26 Based upon a precautionary assumption embedded in the IAQM Construction Dust Guidance (Ref 13.23), the total volume of assumed works is more than 75,000 m<sup>3</sup> and is therefore defined as large.

### Earthworks

- 13.7.27 The main earthworks that would be undertaken are localised preparation for haul roads, pylon foundation construction, and landscaping. The soil type, and thus friability, varies throughout the Study Area. The soil types are Neutral Restored Opencast, Bardsey, Rivington 1, Dale, Fladbury 3, Dunkeswick, East Keswick, Hodnet, Worcester, Whimple 3, Compton, Salwick, Wharfe, Fladbury 2, Wick 1, Salop, Bromsgrove, Arrow, Thames, Bridgnorth and Brockhurst 2. These are predominately loamy/clayey soils which are prone to suspension when dry due to their small grain size. More information on each soil type is given within **Chapter 11 Agriculture and Soils**.
- 13.7.28 The total area of the draft Order Limits falls within the IAQM Construction Dust Guidance (Ref 13.23) range for large sites (over 110,000 m<sup>2</sup>). Therefore, the potential dust emission magnitude is judged to be large for earthwork activities given the scale of the site and the soil types present.

### Construction

- 13.7.29 The total volume of buildings to be constructed on the site is not currently known, however, using professional judgement based on previous National Grid projects of similar scale involving construction of substations, it is anticipated to be above 75,000m<sup>3</sup> with potentially dusty construction materials being used, such as aggregates required to construct the substation aprons. Therefore, the potential dust emission magnitude is judged to be large for construction activities.

### Trackout

- 13.7.30 It is expected that there will be more than 50 HDV outward movements in any one day (based on the anticipated level of change in traffic flows during the construction phase shown in **Table 13.21**), travelling over potentially dusty surface material. It is considered that the potential dust emission magnitude is large for trackout.
- 13.7.31 **Table 13.22** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

**Table 13.22: Potential dust emission magnitude**

| Activity     | Dust Emission Magnitude |
|--------------|-------------------------|
| Demolition   | Large                   |
| Earthworks   | Large                   |
| Construction | Large                   |
| Trackout     | Large                   |

### Assessment of sensitivity of the Study Area

- 13.7.32 The prevailing wind direction for the UK (and hence the Study Area) is from the south west. Therefore, receptors located to the north east of the draft Order Limits (specifically properties in Tibshelf, Alfreton, Ripley, Denby, Kilburn, Horsley and Draycott) are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase, relative to receptors upwind of the working area.
- 13.7.33 There is a total of 57 access points; all are within 250 m of high sensitivity human receptors including two schools: Heath Primary School (CBC) and Morley Primary School (EBC) which are located near access points AP-05 and AP-26, respectively, as shown in **Figure 13.2**.
- 13.7.34 Ecological receptors, including SSSIs, LNRs, LWSs and AWs, are present within the Study Area and described below. While SSSIs and LNRs are classed as medium sensitivity receptors, LWSs and areas of ancient woodland are classed as low sensitivity receptors (Ref 13.23).
- 13.7.35 There are four statutory designated ecological sites sensitive to dust deposition within 50 m of the draft Order Limits which are the Morley Brick Pits SSSI and three LNRs (Chellaston Brickworks, Oakerthorpe and Williamthorpe LNRs).
- 13.7.36 Potential dust-sensitive non-statutory ecological sites present within 50 m of the draft Order Limits are listed below and include 22 LWSs and six AWs:
- Alfreton Park LWS located east of the draft Order Limits in Alfreton.
  - Arleston Canal and Pond LWS located north of the draft Order limits in Arleston.
  - Broadoak Plantation LWS and AW west of the A38 through Swanwick, approximately 200 m east of the draft Order Limits.
  - Booth's Wood and Brook LWS and Booth's Wood AW, and Brown's Lane Meadows LWS, crossing the western edge of the draft Order Limits, and Holbrook Disused Sewage Works LWS within the draft Order Limits, situated north east and east of Holbrook, respectively.
  - Unnamed parcel of AW located north of Booth's Wood which in this assessment has been referred to as 'North of Booth's Wood'.
  - Chellaston Brickworks LWS in Chellaston near the southern region of the draft Order Limits.
  - Church Lane LWS and Stanley-Morley Disused Railway LWS within the draft Order Limits, located east of Morley.

- Corbriggs Marsh LWS crossing the draft Order Limits near the B6039 Mansfield Road in Corbriggs.
- Cromford Canal LWS and Lower Hartshay Wetland LWS crossing the draft Order Limits near access point AP-18 in Lower Hartshay.
- Dunshill Quarry LWS and Dunshill Shelterbelt LWS located along the eastern edge of the draft Order Limits off the A6096 Dale Road.
- East of Far Lane AW near Ockbrook.
- Meadow Farm Meadow LWS located within the draft Order Limits west of Blackwell.
- Millstone Lane Road Verge LWS running across the draft Order Limits south west of Alfreton.
- Oakerthorpe LWS, located west of the draft Order Limits in Oakerthorpe.
- Owlcotes Wood LWS located north east of the draft Order Limits, south of the settlement of Sutton Scarsdale.
- Sutton Springs Wood and Heath Wood areas of AW located north east of the draft Order Limits, south west of Sutton Scarsdale.
- The Warren LWS located east of Coxbench crossing the western edge of the draft Order Limits.
- Twyford Green Complex LWS located south of the draft Order Limits in Twyford approximately 60 m from cross road CR-13.
- Willington Railway Pond No.1 LWS and Willington Railway Pond No.2 LWS located either side of the Crewe to Derby railway line, towards the south western end of the draft Order Limits in Willington.

13.7.37 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source which mainly comprises arable land. The number of high sensitivity receptors (as defined in section 13.1) are given in **Table 13.23**. There are also human sensitive receptors along construction routes within 250 m of the site that may be sensitive to trackout. Background PM<sub>10</sub> levels are predicted to be well below the annual mean objective.

**Table 13.23: Cumulative count of high sensitivity human receptors within defined distances**

|                | Distance from Draft Order Limits |        |         |         |
|----------------|----------------------------------|--------|---------|---------|
|                | 0-20 m                           | 0-50 m | 0-100 m | 0-250 m |
| Receptor Count | 367                              | 1,045  | 2,195   | 6,591   |

13.7.38 Taking the above number and sensitivity into account and following the IAQM Construction Dust Guidance (Ref 13.23) assessment methodology, the sensitivity of the Study Area to changes in dust and PM<sub>10</sub> has been derived for each of the construction activities considered. The results are shown in **Table 13.24**.

**Table 13.24: Sensitivity of the Study Area**

| Potential Impact | Sensitivity of the Surrounding Area |            |              |          |
|------------------|-------------------------------------|------------|--------------|----------|
|                  | Demolition                          | Earthworks | Construction | Trackout |
| Dust Soiling     | High                                | High       | High         | High     |
| Human Health     | Medium                              | Medium     | Medium       | Medium   |
| Ecological       | Medium                              | Medium     | Medium       | Medium   |

**Assessment of dust risk to define site-specific mitigation**

13.7.39 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 13.25** below provides a summary of the risk of dust impacts for the Project. The risk category identified for each construction activity has been used to determine the level of mitigation required.

**Table 13.25: Dust risk summary**

| Potential Impact | Risk       |             |              |             |
|------------------|------------|-------------|--------------|-------------|
|                  | Demolition | Earthworks  | Construction | Trackout    |
| Dust Soiling     | High Risk  | High Risk   | High Risk    | High Risk   |
| Human Health     | High Risk  | Medium Risk | Medium Risk  | Medium Risk |
| Ecological       | High Risk  | Medium Risk | Medium Risk  | Medium Risk |

13.7.40 Good practice measures relevant to dust impacts during construction are set out within **Appendix 4A Draft Outline Code of Construction Practice** and summarised in section 13.6. Based upon the identified risk, an appropriate suite of dust management measures will be specified within the Environmental Control Plans (ECPs) (including the DMP and the CEMP) which will be adhered to during construction (Draft Outline CoCP measures GG03, GG04 and B11). Based upon the application of the ECPs and the further management measures included within the Draft Outline CoCP, it is judged that there would be **no significant effect** associated with dust and PM<sub>10</sub> generated during construction.

**Generator use**

13.7.41 To assess the potential impact on local air quality due to emissions to air from generator use, the number of human sensitive receptors within 100 m of the construction compounds, (conductor) pull sites and pylons have been counted to provide a qualitative assessment of the number of receptors affected; the results are shown in **Table 13.26**.

**Table 13.26: Count of human sensitive receptors within 100 m of generators**

| <b>Location</b>  | <b>Number of Sensitive Human Receptors Within 100m</b> |
|--|--|
| <b>Construction Compounds</b>  |  |
| Chesterfield Substation – Primary construction compound                  | 7  |
| Chesterfield Substation – Substation construction compound               | 1  |
| Holmewood/Williamthorpe – Primary construction compound                  | 7  |
| Willington – Substation construction compound                            | 2  |
| <b>Pull Sites</b>  |  |
| North of the A617  | 1  |
| South of the A6175   | 1  |
| East of the B6039  | 3  |
| South of Park Lane, Shirland   | 1  |
| East of Boothgate/Over Lane, Westbank                                    | 2  |
| East of Over Lane, Belper  | 5  |
| South of French Lane, Horsley  | 1  |
| North of Cloves Hill, Brackley Gate                                      | 4  |
| West of Quarry Road, Brackley Gate                                       | 5  |
| West of Main Road, Morley Smithy   | 1  |
| Church Lane, Morley  | 2  |
| South of Derby Road near Footrills Farm Shop, Stanley and Stanley Common | 1  |
| South of Derby Southern Bypass (A50)                                     | 3  |
| <b>Pylon Sites</b>   |  |
| 186 pylon sites across the construction route of the Project             | 8  |

*Note: There are four human sensitive receptors that are located within 100 m of both pull and pylon sites.*

- 13.7.42 Overall, there are 51 (unique) human sensitive receptors within 100 m of the locations where generators are likely to be used.
- 13.7.43 Given the nature of the potential plant that would be used (3 kVA and 10 kVA generators), the remote locations where they would be deployed and the good practice measures that would be in place, emissions are highly unlikely to cause an exceedance of the 1-hour NO<sub>2</sub> objective value of 200 µg/m<sup>3</sup> (Ref 13.3), especially given the low background NO<sub>2</sub> concentrations in the baseline Study Area. Any impact is judged to be short in duration and therefore unlikely to result in more than a slight adverse impact (**not significant**).
- 13.7.44 These findings will be reviewed and updated as part of the ES to reflect the latest construction information available.

### **Operational phase**

- 13.7.45 Based on experience on similar projects, it is anticipated that operational traffic movements associated with the permanent works within the Study Area will be limited to those associated with the inspection and maintenance of infrastructure (as detailed in **Chapter 4 Description of the Project**) which would involve the use of LDVs (vans and pickup trucks) with only repairs/modification/refurbishment requiring the use of HDVs. The numbers of vehicle movements are expected to be small and as such it is considered that there will be no likely significant effects on air quality. This will be confirmed within the ES once screening of the anticipated traffic volumes against the relevant criteria has been undertaken.

## **13.8 Potential Additional Mitigation Measures**

- 13.8.1 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 13.8.2 Additional mitigation measures are not anticipated to be required in relation to air quality effects associated with both the construction and operational phases. However, this will remain under review during the completion of further assessment and development of the ES.

## **13.9 Monitoring**

- 13.9.1 Baseline air quality surveys of roadside NO<sub>2</sub> concentrations are currently being undertaken at key roadside locations to determine current levels. Should detailed modelling be required as part of the ES, these data will be used to verify the model outputs.
- 13.9.2 As part of the Draft Outline CoCP, a CEMP will be prepared which will include dust management measures as outlined above. Good practice mitigation measures include monitoring activities including site inspections, soiling checks, and checking compliance with the DMP and other ECPs, which will be undertaken by the Contractor(s).
- 13.9.3 The proposed good practice mitigation measures are anticipated to minimise the impacts such that no significant effect would be expected. Consequently, no air quality monitoring beyond on-site and off-site visual inspections would be required during the construction and operational phases of the Project.

## 13.10 Residual Effects

- 13.10.1 Following the implementation of the construction mitigation measures given above, no significant residual effects are anticipated following this preliminary assessment; **Table 13.27** summarises the residual effects for air quality.
- 13.10.2 No mitigation measures, and therefore no changes in residual effects, are anticipated for the operational phase.

**Table 13.27: Summary of residual effects for air quality**

| Description of the Effect   | Sensitive Receptor   | Significance of Effect with Design Embedded and Good Practice Mitigation | Additional Mitigation Measure                 | Residual Effect        |
|---|--|--|---|------------------------|
| <b>Construction Phase</b>   |  |  |   |                        |
| Loss of amenity due to dust soiling at high sensitivity receptors (i.e. residential properties, schools, hospitals and nursing homes) within 250 m of the draft Order Limits and 250 m of site access points (up to 50 m of the routes used by construction traffic). | There are more than 100 high sensitivity receptors within 250 m of the draft Order Limits and 250 m of site access points (up to 50 m of the routes used by construction traffic), therefore the area sensitivity is classified as 'high'.   | <b>Not significant</b>   | None identified in the preliminary assessment | <b>Not Significant</b> |
| Elevated levels of PM <sub>10</sub> (from construction dust) leading to human health impacts at high sensitivity receptors within 250 m of the draft Order Limits and 250 m of site access points (up to 50 m of the routes used by construction traffic).            | There are more than 100 high sensitivity receptors within 250 m of the draft Order Limits and 250 m of site access points (up to 50 m of the routes used by construction traffic). Background PM <sub>10</sub> concentrations within the Study Area are less than 24 µg/m <sup>3</sup> , therefore the area sensitivity is classified as 'medium'. | <b>Not significant</b>   | None identified in the preliminary assessment | <b>Not Significant</b> |
| Harm to ecological receptors sensitive to construction dust soiling within 50 m of the draft Order Limits.  | The highest sensitivity ecological feature within 50 m of the draft Order Limits is a SSSI which is classed as a 'medium' sensitivity receptor.  | <b>Not significant</b>   | None identified in the preliminary assessment | <b>Not Significant</b> |
| Harm to human sensitive receptors within 100 m of locations where generators will be used (i.e. construction compounds, (conductor) pull sites and pylons) due NO <sub>x</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> emissions.                                    | There are 51 (unique) human sensitive receptors within 100 m of the locations where generators will be used.   | <b>Not significant</b>   | None identified in the preliminary assessment | <b>Not Significant</b> |

| Description of the Effect   | Sensitive Receptor   | Significance of Effect with Design Embedded and Good Practice Mitigation | Additional Mitigation Measure   | Residual Effect        |
|---|--|--|---|------------------------|
| Harm to human sensitive receptors within 200 m of affected road links caused by changes in NO <sub>2</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> levels due to changes in traffic flows caused by construction vehicles and diversion routes.                | Impacts on human sensitive receptors within 200 m of affected road links. Initial screening has identified 39 road links that exceed the EPUK/IAQM Planning Guidance criteria for human sensitive receptors.   | <b>Potentially significant</b>   | Significance to be confirmed through additional assessment. Should a significant effect be identified, proportionate mitigation measures would be proposed. | <b>Not Significant</b> |
| Harm to ecological sensitive receptors within 200 m of affected road links caused by changes in levels of NO <sub>x</sub> , NH <sub>3</sub> and nitrogen deposition rates due to changes in traffic flows caused by construction vehicles and diversion routes. | Impacts on ecological sensitive receptors within 200 m of affected road links. The initial screening has also identified 15 road links which exceed the IAQM Nature Conservation Sites Guidance screening criteria for ecological sensitive receptors. |  |   |                        |
| <b>Operational Phase</b>  |  |  |   |                        |
| Harm to human sensitive receptors within 200 m of affected road links caused by changes in NO <sub>2</sub> , PM <sub>10</sub> and PM <sub>2.5</sub> levels due to changes in traffic flows caused by operational vehicles.                                      | Projected changes in traffic flows during operation of the Project are expected to be low and are not predicted to exceed the relevant assessment criteria.  | <b>Not significant</b>   | None identified in the preliminary assessment   | <b>Not Significant</b> |
| Harm to ecological sensitive receptors within 200 m of affected road links caused by changes in levels of NO <sub>x</sub> , NH <sub>3</sub> and nitrogen deposition rates due to changes in traffic flows caused by operational vehicles.                       |  |  |   |                        |

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