



WHITESTONE
solar farm

WHITESTONE SOLAR FARM

Volume 6: Environmental Statement

6.12 Chapter 12: Air Quality

Application Document ref. EN0110020/APP/6.12

Revision 01

June 2026

Planning Act (2008)
Infrastructure Planning (Applications:
Prescribed Forms and Procedure)
Regulations 2009
Regulations 5(2)(a)

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ENVIRONMENTAL STATEMENT

Document Status					
Version	Purpose of Document	Authored by	Reviewed by	Approved by	Review Date
Rev01	DCO Submission	ERM	TLT, DWD, Whitestone Net Zero Ltd	Whitestone Net Zero Ltd	01/06/2026

Approval for Issue		
Whitestone Net Zero Ltd		1 June 2026

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Appendix Number	Appendix Title
12.1	Legislation, Policy, and Guidance

Glossary

Term	Meaning
<i>Cable Corridors</i>	Corridors within which the high voltage cables would be constructed.
<i>Draft Environmental Statement</i>	The Draft Environmental Statement which presented the preliminary environmental information relating to the Proposed Development. The Draft ES was prepared to present information for statutory consultation in accordance with current EIA regulation.

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Term	Meaning
<i>Environmental Statement (ES)</i>	The Environmental Statement which presents the environmental information relating to the Proposed Development. The ES has been prepared to present information for formal consultation in accordance with current EIA regulation.
<i>Order Limits</i>	Maximum extent of the Proposed Development comprising the Site and Cable Corridors.
<i>Scoping Opinion</i>	The opinion in response from the relevant consenting authority to an EIA Scoping Report adopted by the Secretary of State on 3 June 2025 which sets out the aspects to be assessed within an EIA. Informed by consultation with the relevant statutory bodies.
<i>The Applicant</i>	Whitestone Net Zero Ltd.
<i>The Application</i>	The Application submitted to the Secretary of State for a Development Consent Order.
<i>The Proposed Development</i>	The proposed Whitestone Solar Farm.
<i>The Site</i>	The land planned to be used for solar PV array and associated infrastructure, BESS, substation, landscaping and habitat enhancement. The Site is split into W1, W2, and W3.
<i>Whitestone 1 (W1)</i>	The northern parcels of the Whitestone Solar Farm.
<i>Whitestone 2 (W2)</i>	The middle parcels of the Whitestone Solar Farm.
<i>Whitestone 3 (W3)</i>	The southern parcels of the Whitestone Solar Farm.

Acronyms

Acronym	Meaning
<i>AADT</i>	Annual Average Daily Traffic
<i>AIL</i>	Abnormal Indivisible Load
<i>AOT</i>	Accumulated Over a Threshold
<i>AQAP</i>	Air Quality Action Plan
<i>AQMA</i>	Air Quality Management Area
<i>AQS</i>	Air Quality Standards
<i>BESS</i>	Battery Energy Storage System
<i>CDC</i>	City of Doncaster Council
<i>CEMP</i>	Construction Environmental Management Plan
<i>DEFRA</i>	Department for Environment, Food and Rural Affairs
<i>DCO</i>	Development Consent Order
<i>DEMP</i>	Decommissioning Environmental Management Plan
<i>DMBC</i>	Doncaster Metropolitan Borough Council
<i>DMP</i>	Dust Management Plan
<i>DMRB</i>	Design Manual for Roads and Bridges
<i>EIA</i>	Environmental Impact Assessment
<i>EPUK</i>	Environmental Protection UK
<i>ES</i>	Environmental Statement
<i>EU</i>	European Union
<i>GIS</i>	Gas Insulated Switchgear
<i>HDVs</i>	Heavy Duty Vehicles

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Acronym	Meaning
<i>IAQM</i>	Institute of Air Quality Management
<i>LAQM</i>	Local Air Quality Management
<i>LDV</i>	Light Duty Vehicle
<i>LNR</i>	Local Nature Reserve
<i>LSE</i>	Likely Significant Effect
<i>LWS</i>	Local Wildlife Site
<i>NGR</i>	National Grid Reference
<i>NH₃</i>	Ammonia
<i>NNR</i>	National Nature Reserve
<i>NO₂</i>	Nitrogen Dioxide
<i>NO_x</i>	Oxides of Nitrogen
<i>NPPF</i>	National Planning Policy Framework
<i>NPS</i>	National Policy Statement
<i>NSIP</i>	Nationally Significant Infrastructure Project
<i>oCEMP</i>	Outline Construction Environmental Management Plan
<i>oDEMP</i>	Outline Decommissioning Environmental Management Plan
<i>PM</i>	Particulate Matter
<i>RMBC</i>	Rotherham Metropolitan Borough Council
<i>SAC</i>	Special Area of Conservation
<i>SNAP</i>	Site Nitrogen Action Plan
<i>SPA</i>	Special Protection Area
<i>SSSI</i>	Site of Special Scientific Interest
<i>W1</i>	Whitestone 1
<i>W2</i>	Whitestone 2
<i>W3</i>	Whitestone 3
<i>Zol</i>	Zone of Influence

Units

Units	Meaning
<i>ha</i>	Hectares
<i>hr</i>	Hours
<i>m</i>	Metres
<i>µg/m³</i>	Micrograms per cubic meter
<i>ppb</i>	Parts per Billion

12 AIR QUALITY

12.1 Introduction

12.1.1 This Chapter of the Environmental Statement (ES) has been prepared on behalf of Whitestone Net Zero Ltd ('the Applicant') to evaluate the potential effects of the construction, operation and maintenance, and decommissioning of Whitestone Solar Farm (the Proposed Development) in relation to Air Quality. The Proposed Development is described in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**.

Order Limits

12.1.2 The extent of the Order Limits are described in **ES Volume 1, Chapter 3: The Site and Surrounding Area [EN0110020/APP/6.3]** and shown in **ES Volume 3, Figure 3.1: Order Limits [EN0110020/APP/6.19]**. The Proposed Development is described in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and shown spatially on the **Works Plans [EN0110020/APP/2.3]**.

The Proposed Development

12.1.3 The Proposed Development involves the construction, operation and maintenance, and decommissioning of more than 100 megawatts (MW) of solar photovoltaic (PV) array, Battery Energy Storage System (BESS), onsite substations and supporting infrastructure, and grid connection infrastructure. The grid connection infrastructure would connect the Proposed Development to the National Grid at the new 400 kilovolt (kV) National Grid substation proposed on land immediately east of Long Lane, Brinsworth (Long Lane 400kV Substation). National Grid have applied to Rotherham Metropolitan Borough Council (RMBC) for the development of this new substation which is intended by National Grid to be operational in time for the Proposed Development to connect in 2029. This substation is therefore not included in the Proposed Development and will be subject to a separate planning application taken forward by National Grid.

12.1.4 As the Proposed Development would have a generating capacity in excess of 100MW, it is considered to be a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008.

12.1.5 The Proposed Development would be located within the Order Limits. The Order Limits encompass the total area of the project comprising the Site and Cable Corridors. The Site is specifically the land that is planned to be used for solar PV array and associated infrastructure, BESS, substation, landscaping and habitat enhancement. The Site is split into Whitestone 1 (W1), Whitestone 2 (W2), and Whitestone 3 (W3).

12.1.6 Highway Works are sections of the highway network that will contain localised improvements, such as improvements to road edge where it is deteriorated, or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries. These areas will support the movement of construction vehicles on narrower sections of the local highway

network within parts of the construction vehicle routes to the Site (as described in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**)

12.1.7 This Chapter of the ES includes the following sections:

- Legislation, Policy, and Guidance;
- Consultation;
- Assessment Methodology;
- Baseline;
- Embedded Mitigation;
- Assessment of Effects;
- Additional Mitigation and Residual Effects; and
- Cumulative Effects

12.1.8 This Chapter is supported by the following figures in **ES Volume 3, Figures [EN0110020/APP/6.19]**:

- **Figure 12.1: Air Quality Study Area.**

12.1.9 This Chapter is supported by the following appendices in **ES Volume 3, Appendices [EN0110020/APP/6.20]**:

- **Appendix 12.1: Legislation, Policy and Guidance.**

12.2 Legislation, Policy and Guidance

12.2.1 The legislation, policy, and guidance related to Air Quality, as detailed in **ES Volume 3, Appendix 12.1: Legislation, Policy, and Guidance [EN0110020/APP/6.20]**, and relevant to the Proposed Development, are outlined below.

Legislation

12.2.2 Legislation that has been considered includes:

- The Air Quality Standards Regulations 2010¹
- The Air Quality Standards [Amendment] Regulations 2016²;
- Environment Act 2021³;
- Environment Act 1995⁴;
- Environmental Protection Act 1990 UK⁵;
- Directive 2008/50/EC of the European Parliament and of the Council of 21st May 2008 on Ambient Air Quality and Cleaner Air for Europe⁶; and
- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023⁷.

National Policy

12.2.3 National policy that has been considered includes:

- Overarching National Policy Statement (NPS) for Energy (EN-1) (2025)⁸;

- NPS for Renewable Energy Infrastructure (EN-3) (2025)⁹;
- National Planning Policy Framework (NPPF) 2024¹⁰; and
- Air Quality Strategy for England, Scotland, Wales, and Northern Ireland 2007¹¹.

Local Policy

12.2.4 Local policy that has been considered includes:

- City of Doncaster Council (CDC) Air Quality Action Plan (AQAP) 2023¹²;
- Rotherham Metropolitan Borough Council (RMBC) Sites and Policies Plan 2018¹³;
- RMBC Air Quality Action Plan 2016¹⁴;
- RMBC Local Plan Core Strategy 2014¹⁵; and
- Adopted North East Derbyshire Local Plan 2014 – 2034¹⁶.

Guidance

12.2.5 Guidance that has been included in this assessment includes:

- Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction, Version 2.2¹⁷;
- UK Government – Guidance: Air emissions risk assessment environmental permit¹⁸IAQM Land-Use Planning and Development Control: Planning for Air Quality¹⁹;
- Department for Environment, Food and Rural Affairs (DEFRA) Local Air Quality Management (LAQM) Technical Guidance²⁰; and
- Design Manual for Roads and Bridges (DMRB). LA105 Air Quality (vertical barriers)²¹.

12.2.6 The Air Quality Standards (AQS), taken from Air Quality Standards 2010 and UK government guidance for environmental permitting, of relevance for the assessment criteria are shown in **Table 12.1**.

Table 12.1: UK Air Quality Standards

Applicability	Pollutant	Averaging Period	Assessment Criterion ($\mu\text{g}/\text{m}^3$)	Percentile
Sensitive Human Receptor	(Particulate Matter) PM_{10}	Annual Mean	40	N/A
		24 hour, <36 exceedances yearly	50	90.14 th
	$\text{PM}_{2.5}$	Annual Mean	20	N/A
		Annual Mean	40	N/A

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Applicability	Pollutant	Averaging Period	Assessment Criterion ($\mu\text{g}/\text{m}^3$)	Percentile
	Nitrogen Dioxide (NO_2)	1-hour, <18 exceedances yearly	200	99.79 th
Ecological Receptor	Nitrogen oxide (NO_x)	Annual	30	N/A
		Daily (24 hr mean)	75/200*	100 th
	Ammonia (NH_3)	Annual Mean	1 where lichens or bryophytes (including mosses, liverworts and hornworts) are present, 3 where these are not present	N/A

N/A = Not Applicable. *200 $\mu\text{g}/\text{m}^3$ is applicable where ozone is below the Accumulated Over a Threshold (AOT) 40^{ix} critical level and sulphur dioxide is below the lower critical level to 10 $\mu\text{g}/\text{m}^3$. The AOT40 is calculated from the sum of the differences between hourly ozone concentration and 40 parts per billion (ppb) for each hour when the concentration exceeds 40 ppb during a relevant growing season, e.g. for forest and crops.

12.2.7 More detailed information regarding the above legislation, policy and guidance can be found in **ES Volume 3, Appendix 12.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]**.

12.3 Consultation

12.3.1 This section provides a summary of the consultation undertaken to date regarding the Proposed Development. Further detail on the consultation can also be found in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**.

EIA Scoping

12.3.2 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Proposed Development on Air Quality.

12.3.3 A Scoping Opinion was received from the Planning Inspectorate on 3 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).

12.3.4 **Table 12.2** summarises how this Chapter of the ES addresses key points from the Environmental Impact Assessment (EIA) Scoping Opinion comments related to Air Quality.

Table 12.2: Scoping Opinion Comments and How They Are Addressed in This ES

Consultee	Issue Raised	How this is Addressed	Where this is Addressed in the ES
<p><i>The Planning Inspectorate</i></p>	<p>3.7.1: Air Quality Impacts During Operation <i>“The Scoping Report proposes to scope this matter out as there are no combustion sources included as part of the operational phase of the Proposed Development, and due to the low number of traffic movements required (regular maintenance visits only) traffic emissions are considered to be negligible.</i></p> <p><i>On the basis that the ES confirms that traffic movements required during operation are below appropriate threshold guidance levels so that there would be no likelihood of significant effects, the Inspectorate agrees to scope this matter out.”</i></p>	<p>Traffic associated with the operational phase of the Proposed Development will comprise of activities associated with inspection, monitoring, and general Site up-keep. The operational phase will generate negligible levels of traffic, limited to occasional maintenance visits by service vehicles.</p> <p>It is anticipated that such visits will occur once per week on average to any one area within the Site and be via van or other similarly sized vehicles.</p> <p>This level of traffic associated with this phase will be insufficient to trigger the threshold for assessment as set out in the IAQM traffic screening methodology and therefore remains scoped out of this assessment.</p>	<p>Table 12.3</p>

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Consultee	Issue Raised	How this is Addressed	Where this is Addressed in the ES
<i>The Planning Inspectorate</i>	3.7.2: Traffic Effects During Decommissioning: <i>“The Scoping Report anticipates that decommissioning activities would be similar to those during construction. Effects from decommissioning activities are proposed to be scoped in but decommissioning traffic is not identified although construction traffic is scoped in. The ES should assess significant effects to air quality from traffic at decommissioning where they are likely to occur or provide justification as to why there would not be any LSE.”</i>	Impacts from decommissioning traffic are included in the assessment.	Section 12.3, 12.6 and 12.7
<i>The Planning Inspectorate</i>	3.7.3: Ammonia: <i>“Scoping Report paragraph 13.1.2 identifies potential air pollutants to be assessed in the ES. This does not include ammonia without explanation. The ES should include ammonia in the assessment of air pollutants on sensitive receptors where significant effects are likely to occur.”</i>	Impacts from Ammonia (NH ₃) are considered in the assessment on statutory habitats within 200m of roads used for construction access where Significant effects could potentially occur.	Section 12.3, 12.6 and 12.7
<i>The Planning Inspectorate</i>	3.11.8: Human Health: <i>“Significant effects on human health are proposed to be assessed in air quality...The Inspectorate agrees with this approach on the basis that the ES clearly signposts where and how human health is assessed in these relevant aspect chapters.”</i>	The assessment methodology is detailed in Section 12.4. Effects of the Proposed Development on human health are assessed in Section 12.7.	The assessment methodology is detailed in Section 12.4. Effects of the Proposed Development on human health are assessed in Section 12.7.
<i>RMBC</i>	<i>The Air Quality section has not acknowledged the relevant policies in the Core Strategy (Policies</i>	The RMBC Core Strategy is referred to in the Policies,	Section 12.2 and ES Volume 3, Appendix 12.1: Legislation,

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Consultee	Issue Raised	How this is Addressed	Where this is Addressed in the ES
	<i>CS27, CS28, CS30) and Sites and Policies Document (Policies SP52, SP55, SP57).</i>	Guidance and Legislation Section (Section 12.2).	Policy and Guidance [EN0110020/APP/6.20]
<i>Natural England</i>	<p><i>The ES should take account of the risks of air pollution and air pollution and how these can be managed or reduced. This should include taking account of any strategic solutions or Site Nitrogen Action Plans (SNAPs), which may be being developed or implemented to mitigate the impacts of air quality.</i></p> <p><i>Designated sites within 200m of a road which will experience a significant increase in traffic movements should be assessed for impacts due to air pollution from traffic.</i></p>	<p>The Embedded Mitigation section (Section 12.6) outlines relevant and proportional measures to lower impacts from air quality.</p> <p>The methodology and traffic screening takes into account the designated ecological sites within 200m of relevant traffic routes.</p>	Section 12.3, 12.6 and 12.7

Issue Scoped Out of Assessment

12.3.5 Following the scoping exercise, some elements were scoped out of assessment in this ES. **Table 12.3** presents the issues scoped out of assessment.

Table 12.3: Issues Scoped Out of the Assessment

Potential Effect / Topic	Proposal for Assessment within EIA	Development Phase	Rationale
Operational Phase			
Air quality impacts from routine maintenance and operation activities and traffic	Scoped Out	Operation	There are no combustion sources on-site as part of regular operation and maintenance therefore no expected impacts. Traffic associated with the operational phase of the Proposed Development will comprise of activities associated with inspection, monitoring, and general Site up-keep. The operational phase will generate negligible levels of traffic, limited to occasional maintenance visits by service vehicles. It is anticipated that such visits will occur once per week on average to any one area within the Site and be via van or other similarly sized vehicles. This level of traffic associated with this phase will be insufficient to trigger the threshold for assessment as set out in the IAQM traffic screening methodology.

Statutory Consultation

12.3.6 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary information and assessments presented in the Draft Environmental Statement (Draft ES).

12.3.7 **Table 12.4** presents feedback from statutory consultees given at Statutory Consultation, and how this is addressed in this ES.

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Table 12.4: Statutory Consultation Feedback from the Statutory Consultation Period

Consultee	Consultee Feedback	How This is Addressed	Where This is Addressed in the ES
Natural England	<i>“Standardised advice for air quality is attached in annex B. This includes advice on pollutants, approach, mitigation methods, emissions from road transport, emission factors, motorways within the affected road network.”</i>	The standardised advice has been taken into account in the assessment where applicable.	Throughout the Chapter.
Doncaster City Council	<i>“CDC would expect an assessment of the impacts of this additional traffic on concentrations through the AQMA and would wish to better understand what alternatives have been considered and why these were discounted. The Applicant should carefully consider the Council’s published Air Quality Action Plan and an Air Quality Assessment should form part of the evidence base accordingly. CDC would need to be assured that the Proposed Development would not render parts of the Air Quality Action Plan unworkable, in the interests of human health. https://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public”</i>	The IAQM traffic methodologies applied in this assessment consider the additional traffic through the Air Quality Management Area (AQMA) with consideration given to the Council’s Air Quality Action Plan. Details of the construction routes selected to be used by the Proposed Development are provided in ES Volume 3, Appendix 13.2: Transport Statement [EN0110020/APP/6.20] the routes considered are outlined as the best options available to minimise impacts.	Section 12.7.

Targeted Consultation

- 12.3.8 A Targeted Consultation period was held between 4 March and 3 April 2026 on proposed changes to the Order Limits. This included notifying relevant prescribed consultees. Feedback from this Targeted Consultation and the Applicant's response is included in the **Consultation Report [EN0110020/APP/5.1]**.
- 12.3.9 A second Targeted Consultation was held for any individuals that had been identified as land interests after the Statutory Consultation.
- 12.3.10 No comments were provided by statutory consultees through the Targeted Consultation period in relation to Air Quality.

12.4 Assessment Methodology and Significance Criteria

- 12.4.1 This section sets out the scope and methodology for the assessment of the impacts of the Proposed Development on air quality from the construction and decommissioning phases.

Study Areas

- 12.4.2 The Order Limits of the Proposed Development cover an area of 1,488 hectares (ha) and extend from Conisbrough in the north and Kiveton Park / Wales in the south. The Order Limits comprise of the Site and Cable Corridors. The Site is split into three areas – W1, located south of Conisbrough (centred on National Grid Reference (NGR) SK 503962), W2, located between Brinsworth and Treeton in the west and Dinnington in the east (centred on NGR SK 477874), and W3 located south of Kiveton Park and the village of Wales (centred on NGR SK 481807).
- 12.4.3 The Order Limits (the Site and the Cable Corridors as outlined in **ES Volume 1, Chapter 3: The Site and Surrounding Area [EN0110020/APP/6.3]**) have been considered in this assessment.
- 12.4.4 The Environmental Protection UK (EPUK) / IAQM guidance cites the distances where assessment of the potential likely significant effects (LSE) to air quality as a result of construction dust should take place. Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is **Negligible**, and any effects will be **Not Significant**. For the construction dust assessments, the following distances (as specified by the IAQM guidance²²) were analysed:
- A 'human receptor' within:
- 250m of the Order Limits²³; or

- 50m of the route(s) used by construction vehicles on the public highway, and up to 250m from the Site entrances, access points and entrances to Cable Corridorsⁱ.

An 'ecological receptor' within:

- 50m of the Order Limits; and / or
- 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrances, access points and entrances to Cable Corridorsⁱ.

12.4.5 For traffic screening, ecological receptors within 200m of the likely construction traffic routes have been considered as per Design Manual for Roads and Bridges (DMRB) guidance²⁴.

12.4.6 There are a large number of human receptors located within 250m of the Order Limits on all sides These are mainly located in surrounding residential areas including Treeton, Ulley, Aston, South Anston, North Anston, Harthill, Hardwick, Thurcroft, Whiston, Bramley Lings, Conisbrough and Woodall. These also include various isolated residential properties that are located in the area (none of these are located inside the Order Limits specifically).

12.4.7 There are no nationally designated statutory ecological receptorsⁱⁱ within 250m of the Order Limits, with the nearest being Crabtree Wood Site of Scientific Special Interest (SSSI) approximately 920m away. Within 250m of the Order Limits, there are two locally designated statutory ecological sites, which are Firsby Reservoir Local Nature Reserve (LNR) and Anston Stones Wood LNR, three non-statutory locally designated sitesⁱⁱⁱ (Brampton Common Local Wildlife Site (LWS) – on-site; Ulley Country Park LWS – adjacent to the Site; and Killmarsh Pond LWS – 10m north), and two proposed non-statutory locally designated sites, Pebley Oaks Lane Proposed LWS – 95m south and Harthill Reservoir candidate LWS – adjacent to Site (see **ES Volume 3, Figure 3.4: Environmental Designations [EN0110020/APP/6.19]**).

12.4.8 There are a number of designated ecological sites^{iv} that are within 200m of construction traffic routes that feed into the Proposed Development: Edlington Wood SSSI, Potteric Carr SSSI, Sprotbrough Gorge SSSI, Lindrick Golf Course SSSI, Anston Stones Wood SSSI and Crabtree Wood SSSI. **ES Volume 3,**

ⁱ Refers to the designated access point(s) where construction vehicles enter or exit the development site from the public highway. These locations are critical for assessing potential air quality impacts from vehicle movements, particularly in relation to nearby human receptors.

ⁱⁱ Nationally designated statutory ecological receptors refer to ecological sites that are legally protected under UK legislation due to their national importance for biodiversity, geology, or landscape. These include designations such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), Special Areas of Conservation (SACs), and Special Protection Areas (SPAs), among others. These sites are protected under statutes such as the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2017.

ⁱⁱⁱ Non-statutory locally designated sites refer to areas identified for their ecological or geological importance that do not have legal protection under national legislation but are recognised in local planning documents. These sites receive some protection through local policies aimed at conserving biodiversity and resisting development that could cause harm.

^{iv} Designated ecological sites refer to areas identified for their ecological, geological, or biodiversity value and protected through statutory or non-statutory designations. These sites are considered ecological receptors in air quality assessments due to their sensitivity to pollutants like nitrogen and ammonia.

Figure 12.1: Air Quality Study Area [EN0110020/APP/6.19] shows the locations of ecological sites in the area.

12.4.9 The Proposed Development is partly located within the Rotherham Air Quality Management Area (AQMA) 1 – Part 1 (NO₂) at the northwest section of the Site. Rotherham AQMA 1 – Part 1 (NO₂) was declared for an exceedance of NO₂ in 2002 and covers the area around Brinsworth, Catcliffe and Upper Whiston. Only two sections of the Site, a total of 36.2ha (a very small proportion of the overall Site), are located within the AQMA. The Proposed Development is also located approximately 1km southwest of the Doncaster Metropolitan Borough Council (DMBC) AQMA 5, 4km southwest of DMBC AQMA 2 and 3.5km east of the Sheffield Citywide AQMA. Traffic accessing the Proposed Development will have to travel through these AQMAs. Other AQMAs within 10km of the Proposed Development are the Rotherham AQMA 1 – Part 2, Rotherham AQMA 2 – Part 4 and the Rotherham AQMA Rawmarsh 2016. Traffic travelling from this far away is highly unlikely to impact on receptors related to the Proposed Development and as such are not assessed. **ES Volume 3, Figure 12.1: Air Quality Study Area [EN0110020/APP/6.19]** shows the locations of all AQMAs in the area including those further away however only Rotherham AQMA 1 – Part 1 (NO₂), Sheffield Citywide AQMA, Doncaster AQMA 2 and AQMA5 are considered in the assessment.

Identifying Receptors and Receptor Sensitivity

Construction Dust

12.4.10 The dust assessment is based on a screening methodology provided by IAQM. The method considers impacts on both ecological and human receptors. Factors defining the sensitivity of a receptor are presented in **Table 12.5**.

Table 12.5: Factors Defining the Sensitivity of a Receptor

Sensitivity	Human (Health)	Human (Dust Soiling)	Ecological
High	Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM ₁₀ ^(a) Examples include residential dwellings, hospitals, schools and residential care homes.	Regular exposure. High level of amenity expected. Appearance, aesthetics or value of the property would be affected by dust soiling. Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	Nationally or Internationally designated site with dust sensitive features ^(b) Locations with vascular plant species ^(c)
Medium	Locations where workers are exposed over a	Short term exposure. Moderate level of amenity expected.	Nationally designated site with dust sensitive features ^(b)

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	time period relevant to the air quality objectives for PM ₁₀ ^(a) Examples include office and shop workers ^(d) .	Possible diminished appearance or aesthetics of property due to dust soiling. Examples include parks and places of work.	Nationally designated sites with a particularly important plant species where dust sensitivity is unknown.
Low	Transient human exposure. Examples include public footpaths, playing fields, parks and shopping streets.	Transient exposure. Enjoyment of amenity not expected. Appearance and aesthetics of property unaffected. Examples include playing fields, farmland ^(e) , footpaths, short-term car parks and roads.	Locally designated site with dust sensitive features ^(b)
<p>(a) In the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day.</p> <p>(b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).</p> <p>(c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.</p> <p>(d) Does not include workers exposure to PM₁₀ as protection is covered by Health and Safety at Work legislation.</p> <p>(e) Except commercially sensitive horticulture.</p>			

- 12.4.11 The sensitivity of a receptor will also depend on a number of additional factors, including any history of dust generating activities in the area, likely cumulative dust impacts from nearby construction sites, any pre-existing screening such as trees or buildings that would limit dust transport from a site, and the likely duration of the impacts. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.
- 12.4.12 The sensitivity of the area to health impacts is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health impacts are dependent on the existing PM₁₀ concentrations in the area. **Table 12.6** summarises the criteria for determining the overall sensitivity of the area to human health impacts and **Table 12.7** summarises the ecological sensitivities.

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Table 12.6: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ (µg/m ³)	Number of Receptors	Distance from the Source				
			<20m	<50m	<100m	<200m	<350m
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 12.7: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source	
	<20m	<50m
High	High	Medium
Medium	Medium	Low
Low	Low	Low

12.4.13 The sensitivity of human receptors within the radius of potential impacts from dust raising activities is to be considered high for all types of receptors (residential areas, schools, hospitals etc.) within the framework of the dust impact assessment as per IAQM construction dust guidance. For other types of impact, residential areas are considered to be of medium sensitivity. This reflects a lower potential for acute health effects compared to dust exposure, while still acknowledging the importance of these receptors in the overall air quality assessment. Ecological receptors are also considered to be of high sensitivity where they support habitats vulnerable to dust deposition or air pollutants such as nitrogen and ammonia. This assessment aligns with IAQM guidance and Natural England’s advice on air quality impacts on designated ecological sites.

Methodology for the Assessment of Effects

Construction Dust

12.4.14 The dust assessment is based on a screening methodology provided by IAQM¹⁷. The method considers impacts on human receptors and ecological receptors.

12.4.15 The IAQM sets out a methodology for assessing the risk of Significant effects associated with dust emissions, and the level of mitigation required to render impacts on air quality negligible and effects on receptors **Not Significant**. This methodology has been utilised to identify the dust mitigation required. This approach divides construction activities into the following dust emission sources:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (this is where mud and debris from a building site adhering to vehicles are deposited onto public highways).

12.4.16 The risk of dust effects (low, medium or high) is determined by the scale (magnitude) and nature of the works and the proximity of sensitive human and ecological receptors. The IAQM guidance recommends that an assessment be undertaken where there are sensitive human and ecological receptors (specific distances are specified in Paragraph 12.4.4).

Construction Traffic Screening

Human Receptors

12.4.17 A screening process has been used to assess whether there are any roads where construction traffic flows could result in a Significant impact on air quality. This is

based on the screening criteria set out by the IAQM for road traffic²⁵. These criteria are as follows:

- Outside an AQMA: change in Heavy Duty Vehicles (HDVs) >100 HDVs/Day;
- Outside an AQMA: change in Light Duty Vehicles (LDVs) >500 LDVs/Day;
- Inside or adjacent to an AQMA: change in HDVs > 25 HDVs/Day; and
- Inside or adjacent to an AQMA: change in LDVs >100 LDVs/Day.

12.4.18 Where a road is outside an AQMA a second stage of screening is undertaken using the DEFRA criteria from the Local Air quality Management Guidance TG (22)²⁶. Roads are screened in for further assessment where:

- 5,000 vehicles/day- exposure within 2m from kerb – slow moving traffic with frequent stop/start;
- 10,000 vehicles/day - exposure within 5m from kerb \geq 1-hour; and
- 2,500 HGVs/day – exposure within 10m from kerb (20m in conurbations > 2m inhabitants).

12.4.19 The screening assessment for the Proposed Development is outlined in Paragraphs 12.7.6 – 12.7.9).

12.4.20 Impacts from construction activities are assessed semi-quantitatively using the methodology described in the IAQM guidance. All impacts will be mitigated to **Not Significant** through implementation of embedded mitigation measures outlined in section 12.6 of this Chapter . Details of the determination of significance of effect are presented in Section 12.7.

Ecological Receptors

12.4.21 For sensitive ecological receptors criteria based on the DMRB methodology has been used to determine whether air quality impacts from construction traffic can be scoped out or require an assessment for these receptors²⁷. The criteria are based on the changes between the 'do something' traffic (with the Proposed Development) compared to the 'do minimum' (without the Proposed Development) in the opening year with thresholds as follows:

- Annual average daily traffic (AADT) \geq 1,000; or
- HDV AADT \geq 200.

12.4.22 This methodology applies specifically to areas that are likely to be sensitive to changes in air quality. For example, where there are:

- Monitored exceedances of air quality thresholds;
- AQMAs;
- Areas identified by DEFRA as exceeding EU limit values; and/or
- Designated habitats (within 200m of the affected road network).

12.4.23 In addition, only sites that are sensitive to nitrogen deposition, due to ammonia emissions from vehicles, are required to be included in the assessment. It is not necessary to include sites, for example, that have been designated as a geological feature or watercourse and noting that non-statutory designated sites are not subject to critical loads for nutrient nitrogen or acid deposition.

12.4.24 Based on the criteria above there are six relevant ecological receptors included in the assessment as outlined in paragraph 12.4.8:

- Edlington Wood SSSI;
- Potteric Carr SSSI;
- Sprotbrough Gorge SSSI;
- Lindrick Golf Course SSSI;
- Anston Stones Wood SSSI; and
- Crabtree Wood SSSI.

Decommissioning Impacts

12.4.25 Impacts from decommissioning activities are assumed to have the same impacts as for construction phase taking into account dust and traffic. It is not possible to accurately forecast baseline environment including traffic flow levels 60 years into the future. For this reason, prior to decommissioning of the Proposed Development, appropriate traffic management procedures agreed with the relevant authorities at the time. A Decommissioning Environmental Management Plan (DEMP) will be prepared at the cessation of operations of the Proposed Development, in consultation with the relevant authorities. A Decommissioning Traffic Management Plan will be included in the DEMP. An **outline Decommissioning Environmental Management Plan (oDEMP) [EN0110020/APP/5.11]** has been submitted with the Application

Significance Criteria

Magnitude of Impact

12.4.26 The magnitude of the dust impacts for each source is classified as large, medium or small depending on the scale of the proposed works. **Table 12.8** summarises the IAQM criteria to determine the magnitude of dust emissions. These criteria are used in combination with site-specific information and professional judgement.

Table 12.8: Dust Criteria

Source	Large	Medium	Small
Demolition	Total building volume >75,000m ³ Potentially dusty material (e.g. concrete) On-site crushing and Screening Demolition activities >12m above ground level	Total building volume 12,000-75,000m ³ Potentially dusty material Demolition activities 6-12m above ground level	Total building volume <12,000m ³ Construction material with low potential for dust release Demolition activities <6m above ground level Demolition during wetter months
Earthworks	Total site area >110,000m ² Potentially dusty soil type (e.g. clay) >10 heavy earth moving vehicles	Total site area 18,000-110,000m ² Moderately dusty soil type (e.g. silt) 5 – 10 heavy earth moving vehicles	Total site area <18,000m ² Soil type with large grain size (e.g. sand) <5 heavy earth moving vehicles

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Source	Large	Medium	Small
	active at any one time Formation of bunds > 6m in height	active at any one time Formation of bunds 3-6m in height	active at any one time Formation of bunds <3m in height
Construction	Total building volume >75,000m ³ On-site concrete batching Sandblasting	Total building volume 12,000 – 75,000m ³ Potentially dusty construction material (e.g. concrete) On-site concrete batching	Total building volume <12,000m ³ material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HDV movements in any one day ^(a) Potentially dusty surface material (e.g. high clay content) Unpaved road length >100m	20 – 50 HDV movements in any one day ^(a) Moderately dusty surface material (e.g. silt) Unpaved road length 50 – 100m	< 20 HDV movements in any one day ^(a) Surface material with low potential for dust release Unpaved road length <50m
^(a) HDV movements refer to outward trips (leaving the Site) by vehicles of over 3.5 tonnes			

Defining the Significance of Effect

12.4.27 The overall impact on air quality is defined by combining the sensitivity of the affected receptors with the magnitude of the predicted change in air quality resulting from the Proposed Development. Sensitivity is determined based on the type and importance of the receptor (e.g., residential areas, schools, hospitals), while magnitude reflects the scale, duration, and frequency of emissions or pollutant concentrations.

12.4.28 The sensitivity and impact magnitude are then combined to determine the risk of the effect (outlined in **Table 12.9** and **Table 12.10**). It is always assumed, as per IAQM guidance, that based on the risk, a proportionate level of mitigation is applied and the impact is always “Not Significant”.

Table 12.9: Risk of Effect (Demolition)

Area Sensitivity	Magnitude of Impact		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table 12.10: Risk of Effect (Earthworks, Construction and Trackout)

Area Sensitivity	Magnitude of Impact		
	Large	Medium	Small
High	High	Medium	Low

Area Sensitivity	Magnitude of Impact		
	Large	Medium	Small
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Basis of the Assessment

- 12.4.29 **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** provides a description of the Proposed Development. It has been used to inform this assessment, alongside the traffic information included in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**.
- 12.4.30 The construction phase for the Proposed Development is expected to span 24 to 36 months. While the exact timeline will depend on various factors, including the submission and determination of the Development Consent Order (DCO), the current plan is to commence construction in 2027 and conclude by 2029. However, construction activity, and therefore peak construction traffic, will only occur in any one location for a limited portion of this overall 24–36 month period, as works will progress sequentially across the Proposed Development.
- 12.4.31 The worst-case traffic is currently expected to be during the peak construction period between mid-2028 and mid-2029. Therefore, for the purposes of this assessment, it has been assumed that 2028 is the peak construction year to allow for delays that may occur.
- 12.4.32 Decommissioning is likely to be in the same manner as for construction (i.e., any activities are likely to occur within construction working areas and to require no greater amount or duration of activity than assessed for construction).

Assumptions, Exclusions and Limitations

- 12.4.33 Although it is unlikely that the overall predicted impacts of the Proposed Development on air quality will diverge from the assessment presented, the potential uncertainty is that according to DEFRA background mapping, baseline concentrations for the year 2027, when the Proposed Development is expected to be built, are projected to be lower than current levels.

12.5 Baseline

Data Sources

Existing Baseline Data Sources

- 12.5.1 This section provides a review of the existing air quality data in the vicinity of the Study Areas (outlined in 12.4.2 and 12.4.3) in order to provide a benchmark against which to assess potential air quality impacts of the Proposed Development. Baseline air quality data for relevant pollutants were sourced from national and local monitoring networks. No additional baseline surveys have been undertaken as the Proposed Development has no expected impacts to air quality that would influence the long-term baseline.

12.5.2 Existing air quality conditions within the Study Area have been defined and identified using a number of approaches and sources, including:

- DEFRA online Interactive Monitoring Networks Map^{28,29};
- DEFRA's online UK Ambient Air Quality Interactive Map³⁰;
- DEFRA's online Air Quality Management Area Interactive Map³¹; and
- Local authority monitoring data³².

Data Sources for Future Baseline

12.5.3 Future baseline air quality conditions within the Study Area have also been assessed using the DEFRA mapping for 2029³³ as this is the anticipated first year of operation. These are outlined below.

Existing Baseline Conditions

12.5.4 The baseline has been derived from publicly available sources including DEFRA background mapping and local council monitoring networks to derive a representative local baseline. These sources are outlined in Section 12.5 and shown in **ES Volume 3, Figure 12.1: Air Quality Study Area [EN0110020/APP/6.19]**.

12.5.5 Analysis of the UK DEFRA background maps (based on 2021)³⁴ for the Proposed Development (taken as an average of various points due to the size of the Proposed Development's footprint) shows the following results:

- Annual mean PM₁₀ level 14.5µg/m³;
- Annual mean PM_{2.5} level 7.03µg/m³;
- Annual mean NO_x level 14.8µg/m³; and
- Annual mean NO₂ level 11.2µg/m³.

12.5.6 The closest local authority monitoring for NO₂ occurs with diffusion tubes in the nearby village of Brinsworth, which is at the closest point approximately 500m away from the Proposed Development³⁵.

12.5.7 The RMBC 2023 Air Quality Annual Status Report shows:

- RDT52 Grange Farm Close (roadside): 24.5µg/m³ annual mean in 2022; and
- RDT49 Brinsworth Howarth School Gate (roadside): 25.0µg/m³ annual mean in 2022.

12.5.8 The baseline NO₂ values taken from local monitoring within the AQMA closest to the Site are approximately 61 - 63% of the NO₂ annual mean standard. This is low compared with expected levels within an AQMA as an AQMA is usually declared when high levels of a pollutant are measured in the area. This AQMA was declared in 2002, and the local air quality appears to have improved since this time. The local measurements were also a minimum of 500m away from the Proposed Development but were set back from the main M1 trunk road possibly resulting in the lower levels. s

12.5.9 There is no monitoring of PM₁₀ in the RMBC District, however there is PM_{2.5} monitoring taking place at St Ann's School, approximately 4km from the Proposed Development:

- St Ann's School (urban background): 7.8µg/m³ annual mean in 2022.

- 12.5.10 In England local authorities are required to manage air quality under the LAQM regime. Where air pollution levels are approaching or exceed the air quality standards, the local authority is required to declare an AQMA, monitor pollution and implement a program of improvements to bring down these concentrations. The absence of monitoring data, and AQMAs declared for PM₁₀ and the low baseline pollution from the Defra mapping are all evidence that the baseline for PM₁₀ is well below the air quality standards and the absence of any specific monitoring is of no concern.
- 12.5.11 There is no local monitoring of ammonia (NH₃) or DEFRA mapping values available. As such a representative site nearest to the Proposed Development was selected:
- Wardlow Hay Cop monitoring site in the Peak District was deemed the most suitable: 1.2µg/m³ annual mean in 2024.

Future Baseline Conditions

- 12.5.12 The future air quality baseline has been assessed using DEFRA Mapping based on 2029³⁶ as this represents the likeliest first year of operation for the Proposed Development. For the Site an average of various points, due to the size of the Proposed Development's footprint, shows the following results:
- Annual mean PM₁₀ level 13.97µg/m³;
 - Annual mean PM_{2.5} level 6.51µg/m³;
 - Annual mean NO_x level 10.38µg/m³; and
 - Annual mean NO₂ level 8.07µg/m³.
- 12.5.13 Projected baseline concentration for PM₁₀, NO_x and NO₂ in future scenario (2029) are anticipated to be lower than current observed levels. This conclusion is based on national air quality modelling by DEFRA, which incorporates expected improvements in vehicle emissions standards, increased uptake of electric vehicles, tighter industrial emission controls, and ongoing implementation of air quality management policies.

12.6 Embedded Mitigation

- 12.6.1 The following embedded mitigation measures relevant to air quality have been identified and have been considered as part of the assessment. A Commitments Register has been included within this ES (see **ES Volume 3, Appendix 2.3: Commitments Register [EN0110020/APP/6.20]**).

Construction

- 12.6.2 It is anticipated that all impacts will be mitigated to **Not Significant** through implementation of measures, to be detailed within the **outline Construction Environmental Management Plan (oCEMP) [EN0110020/APP/5.9]**, which is submitted with the Application. A Construction Environmental Management Plan (CEMP) would be provided prior to the commencement of works.
- 12.6.3 Embedded mitigation measures required in order to render the effects from construction phase as Not Significant are derived from IAQM guidance and are set out in **Table 12.11**. Specific mitigation measures required are to be discussed

with the relevant contractors, taking into account recommendations from **Table 12.11**.

Table 12.11: Construction Dust Mitigation

Communications
Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site.
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the Site manager.
Display the head or regional office contact information.
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the Site. The DMP may include monitoring of dust deposition, dust flux, real time PM ₁₀ continuous monitoring and/or visual inspections.
Site Management
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the relevant local authority when asked.
Record any exceptional incidents that cause dust and/or gaseous emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
Hold regular liaison meetings with other high risk construction sites within 250m of the Site Boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces within 100m of site boundary.
Carry out regular Site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the relevant local authority when asked.
Increase the frequency of Site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
If required agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the local authority. Where possible commence baseline monitoring at least three months before work commences on-site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.

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Preparing and Maintaining the Site

Plan Site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.

Erect solid screens or barriers around dusty activities or the Site Boundary that are at least as high as any stockpiles on Site.

Fully enclose site or specific operations where there is a high potential for dust production and the Site is active for an extensive period.

Avoid Site runoff of water or mud

Keep Site fencing, barriers and scaffolding clean using wet methods.

Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on Site. If they are being re-used on-site cover as described below.

Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle / Machinery and Sustainable Travel

Ensure all vehicles switch off engines when not in use - no idling vehicles.

Reduce the use of diesel or petrol powered generators and encourage use mains electricity or battery powered equipment where practicable.

Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).

Within the oCTMP include details to manage the sustainable delivery of goods and materials

Within the oCTMP include details that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)

Operations

Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.

Use enclosed chutes and conveyors and covered skips.

Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Ensure equipment is readily available on-site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

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Avoid bonfires and burning of waste materials.

Earthworks

Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.

Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.

Only remove the cover in small areas during work and not all at once.

Construction

Avoid scabbling (roughening of concrete surfaces) if possible.

Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.

For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.

Trackout

Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use.

Avoid dry sweeping of large areas.

Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.

Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.

Record all inspections of haul routes and any subsequent action in a site log book.

Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable).

Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever site size and layout permits.

Access gates to be located at least 10m from receptors where possible.

Decommissioning

- 12.6.4 Decommissioning impacts from dust will likely be of a similar magnitude and extent to the construction phase. As such, the same mitigation measures used during construction are proposed to render impacts during decommissioning to Not Significant. An **oDEMP [EN0110020/APP/5.11]** has been submitted as part of the Application and describes the framework of mitigation measures as identified in the ES to be followed and carried forward into a DEMP.

12.7 Assessment of Effects

Construction Dust

- 12.7.1 Section 12.4 outlines the methodology for determining the sensitivity of receptors, the magnitude of impact of construction activities, and the overall significance of effects.
- 12.7.2 The sensitivity of receptors (see **Table 12.5**) has been determined as follows:
- Human health receptor sensitivity: **Medium** as the construction area is located in an area where members of the public would in general not be exposed for more than 24 hours;
 - Dust soiling sensitivity (Human): **High** as the Proposed Development is in proximity to residential areas. There are a large number of human receptors located within 250m of the Order Limits on all sides; and
 - Ecological sensitivity: **Low** as there are no nationally designated statutory ecological receptors within 250m of the Order Limits, with the nearest being Crabtree Wood SSSI roughly 900m away.
- 12.7.3 The sensitivity of the area to human health impacts (see **Table 12.6**) has been determined as follows:
- Area sensitivity: **High**, as there are >100 receptors within 100m from the Proposed Development and baseline PM₁₀ are <24µg/m³.
- 12.7.4 The sensitivity of the area to ecological impacts (see **Table 12.7**) has been determined as follows:
- Area sensitivity: **Low** as the sensitivity of receptors were determined as low. There are no sensitive receptors within 50m distance.
- 12.7.5 The magnitude of the dust impacts for each construction activity (for combined Human Health and Ecological receptors) (see **Table 12.8**) has been determined as follows:
- Demolition: **N/A** - no demolitions are required as part of the Proposed Development;
 - Earthworks: **Large Magnitude** – whilst the total Proposed Development area will be >110,000 m² (which would indicate large magnitude) it is unlikely that construction will be occurring at all areas at the same time;
 - Construction: **Small Magnitude** – total building volume will be <12,000m³ with low potential for dust release; and

- Trackout: **Large Magnitude** – HDV movements per day are estimated to be a maximum of 215 two-way flow (equivalent of no more than 108 outward trips).
- 12.7.6 However, as detailed in Section 12.6, the Proposed Development has a range of embedded mitigation measures in relation to dust minimisation and management during construction that follow recommended industry guidance. With this embedded mitigation in place, the magnitude of dust impacts for earthworks and trackout will be reduced to **Small Magnitude**.
- 12.7.7 The risk of the effects (significance) is assessed by taking into account the area sensitivity and the magnitude (inclusive of embedded mitigation) for each activity using **Table 12.9** and **Table 12.10**.
- 12.7.8 The risk of impacts to human receptors from the construction activities have been assessed as:
- **N/A** for demolition;
 - **Low** for earthworks;
 - **Low** for construction; and
 - **Low** for trackout.
- 12.7.9 The risk of impacts to ecological receptors from the construction activities as:
- **N/A** for demolition;
 - **Negligible** for earthworks;
 - **Negligible** for construction; and
 - **Negligible** for trackout.
- 12.7.10 This assessment concludes that risk of construction dust effects are predicted to be **Negligible**, or at worst **Low** for both human receptors and ecological receptors. As a result, with the correct implementation of the recommended embedded mitigation (see **Table 12.11**), construction dust effects will be **Not Significant**.

Construction Traffic

- 12.7.11 Construction traffic data supplied by the Applicant for the road network (and outlined in the **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**) has been assessed using the screening methodologies outlined above. The differences in AADT for construction LDVs and HDVs compared to the baseline are compared to the screening criteria in Section 12.4.
- 12.7.12 Nine roads screen in according to the IAQM criteria of which eight are located in or adjacent to an AQMA. The relevant AQMAs are Rotherham AQMA 1 – Part 1 (NO₂) as traffic is anticipated to travel via the south of Rotherham and Doncaster AQMA No. 2 and AQMA No.5 which would include traffic accessing the north of the Site on the A630 through Conisbrough and Warmsworth.

Table 12.12: Construction Traffic Screening

Road Link	Change in Traffic Numbers per vehicle type in AADT		Located within or Adjacent to AQMA	Screen in LDV	Screen in HDV
	LDV	HDV			
A630 High Road	17	69	Yes	No	Yes
A630 Sheffield Road (Between Edlington Ln and Low Rd)	17	69	Yes	No	Yes
Edlington Lane	0	0	No	No	No
B6094	0	0	Yes	No	No
Carr Lane	0	0	No	No	No
Common Lane	0	0	No	No	No
Ruddle Lane (Between Carr Ln and Shipman Bank)	0	0	No	No	No
Shipman Bank	0	0	No	No	No
Beacon Lane (North)	0	0	No	No	No
Ruddle Lane (Between Beacon Ln and Common Ln)	0	0	No	No	No
Common Lane	33	0	No	No	No
Hellaby Lane	38	70	No	No	No
B6093	5	0	No	No	No
A630 Doncaster Road (Between Old Rd and B6093)	172	0	No	No	No
A630 Sheffield Road (Between Holywell Ln and Old Rd)	0	69	Yes	No	Yes
A631 (Between M18 and Flash Ln)	58	99	No	No	No
Moor Lane South	5	0	No	No	No
Flash Lane	48	25	No	No	No
A631 (Between Flash Ln and B6060)	27	74	No	No	No
A631 (Between B6060 and A6123)	27	0	No	No	No
A631 (Between A6123 and A618)	121	0	No	No	No
A631 (Between A618 and Long Ln)	277	68	Yes	Yes	Yes
Long Lane	19	6	No	No	No
Howarth Lane (Under A630)	248	84	Yes	Yes	Yes

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A618 (Between A631 and Gulthwaite Common Ln)	140	62	Yes	Yes	Yes
Gulthwaite Common Lane	34	15	Yes	No	No
Reservoir Road	48	0	No	No	No
A618 (Between Reservoir Rd and Treeton Ln)	9	6	No	No	No
Ulley Lane	0	0	No	No	No
Main Street Ulley	48	0	No	No	No
Penny Hill Lane, West of M1	54	15	No	No	No
Penny Hill Lane, East of M1	0	15	No	No	No
Brampton lane	5	0	No	No	No
Common Lane South	64	21	No	No	No
Long Road	146	72	No	No	No
Unnamed Road	0	0	No	No	No
Common Road	0	0	No	No	No
Cramfit road	0	0	No	No	No
Todwick road Between Pocket Handkerchief In And A57	167	84	No	No	No
Pocket Handkerchief lane	169	84	No	No	No
Penny Piece Lane	0	0	No	No	No
A57 (Near Greenscen Side Farm)	101	60	No	No	No
A57 (West of Mill Ln)	54	36	No	No	No
A57 (Between Todwick Rd and M1)	384	215	No	No	Yes
Kiveton Lane	116	71	No	No	No
A57 (Between M1 and A618)	62	27	No	No	No
A618 Mansfield Road	0	0	No	No	No
A618 Aughton Road	0	0	No	No	No
Second Lane	0	0	No	No	No
B6060 (North of Second Ln)	0	74	No	No	No
B6060 (South of Second Ln)	20	74	No	No	No
Field Lane	3	0	No	No	No
A618 (North of B6059)	74	27	No	No	No
A618 (South of B6059)	74	27	No	No	No
B6059 (North of Second Lane)	0	0	No	No	No

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B6059 (South of Second Lane)	0	0	No	No	No
Kiveton Lane	116	71	No	No	No
Hard Lane (North)	120	71	No	No	No
Hard Lane (South)	70	44	No	No	No
Woodall Lane	6	0	No	No	No
Walseker Lane	0	0	No	No	No
Dowcarr Lane	0	0	No	No	No
A618 (North)	74	27	No	No	No
A618 (South)	75	27	No	No	No
Loverose Way	36	14	No	No	No
A630	189	69	Yes	Yes	Yes
Ruddle Lane (Between Shipman Bank and Beacon Lane)	0	0	No	No	No
Slacks Lane	48	25	No	No	No
Morthen Lane	3	0	No	No	No
Ulley Lane	1	0	No	No	No
Common Lane (North)	35	6	No	No	No
Hawk Hill Lane (West)	64	19	No	No	No
Hawk Hill Lane (East)	21	6	No	No	No
Killmarsh lane	6	0	No	No	No
Edlington lane(B6376)	0	0	Yes	No	No
Lidget Lane	36	24	No	No	No
Long Lane	43	16	Yes	No	No
Pleasley Road	108	68	Yes	Yes	Yes
B6060 Morthen Road	11	0	No	No	No
Sandy Lane	22	14	No	No	No
Newhall Lane	0	0	No	No	No
A631	58	99	No	No	No
Cumwell Lane	55	14	No	No	No
Warwick Road	0	0	No	No	No
Bramley Lane	24	38	No	No	No
Common Lane	11	70	No	No	No
B6059 Dog Kennels Lane	0	0	No	No	No
B6059 Red Hill	0	0	No	No	No
Manor Road	0	0	No	No	No
Packman Lane	0	0	No	No	No
A630 High Road	17	69	Yes	No	Yes
A630 Sheffield Road (Between Edlington Ln and Low Rd)	17	69	Yes	No	Yes
Edlington Lane	0	0	No	No	No
B6094	0	0	Yes	No	No
Carr Lane	0	0	No	No	No
Common Lane	0	0	No	No	No

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Ruddle Lane (Between Carr Ln and Shipman Bank)	0	0	No	No	No
Shipman Bank	0	0	No	No	No
Beacon Lane (North)	0	0	No	No	No
Ruddle Lane (Between Beacon Ln and Common Ln)	0	0	No	No	No

12.7.13 The road link that falls outside of an AQMA that screens in for HDVs (A57 - Between Todwick Rd and M1) can be screened out of the assessment using the DEFRA second stage screening criteria²⁰ as less than 2,500 HDVs a day travel along that link.

12.7.14 In addition, Rotherham AQMA – Part 1 (NO₂) and Doncaster AQMA No. 5 show a downward trend in monitored NO₂ with both showing values under the AQS³²³⁷ with the latter being under the AQS for the past three years of monitoring as of 2023 when the last annual status report was available. As such it can be argued that the more stringent IAQM AQMA screening criteria is not suitable for the links within these areas and these links can therefore be screened out. This includes the road links A631 (between A618 and Long Ln), Howarth Lane (under A630), A618 (Between A631 and Gulthwaite Common Ln), Pleasley Road within Rotherham AQMA – Part 1 and A630 Sheffield Road (Between Holywell Ln and Old Rd) adjacent to Doncaster AQMA No. 5. This would leave three links screened in for Doncaster AQMA No 2 including A630 high Road, A630 Sheffield Road (Between Edlington Ln and Low Rd) and A630.

12.7.15 For all the links, including those still screened in after the previous criteria have been applied it is anticipated that all links can be further screened out based on the length of construction period. The length of construction duration is noted to be 24 to 36 months however it is anticipated that this will likely be phased and construction will not occur in all locations simultaneously. As such, it is anticipated that specific construction periods will be less than 24 months. Therefore, according to Design Manual for Roads and Bridges guidance (Section 2, paragraph 2.60)²⁴. the links can be screened out.

12.7.16 As these roads are noted to screen out based on IAQM, DEFRA and DMRB criteria for human receptors, additional assessment on sensitive ecological receptors was also screened out, and therefore, **No Significant** effects are expected from construction traffic on human receptors or ecological receptors.

Decommissioning

12.7.17 Once decommissioning works are agreed and planned following the lifespan of the Proposed Development it is expected that the main air quality related impacts will be similar to construction dust and construction traffic. Therefore, similar mitigation measures should be applied during decommissioning to those recommended during construction.

- Decommissioning dust: impacts are predicted to be Negligible, or at worst Low, and therefore **Not Significant**, with the correct implementation of the recommended embedded mitigation; and

- Decommissioning traffic: impacts from decommissioning traffic will likely be screened out based on the traffic numbers considered for construction of the Proposed Development. It is anticipated that decommissioning traffic will have either the same or less of a footprint than construction traffic which is anticipated to screen out. It is not possible to accurately forecast baseline environment including traffic flow levels 60 years into the future. For this reason, prior to decommissioning of the Proposed Development, a traffic assessment will be undertaken, and appropriate traffic management procedures agreed with the relevant authorities at the time.
- A DEMP will be prepared at the cessation of operations at the Proposed Development and secured by a requirement of the DCO. A Decommissioning Traffic Management Plan will be included in the DEMP.

12.8 Additional Mitigation Measures and Residual Effects

Additional Mitigation

12.8.1 No additional mitigation is proposed for air quality impacts.

Residual Effects

12.8.2 A summary of the potential Air Quality effects is presented in **Table 12.13**.

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Table 12.13: Summary of Residual Effects

Activity and Impact	Embedded Mitigation	Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Additional Mitigation	Significance of Residual Effect
Construction Dust	Outlined in Table 12.11 and oCEMP	Human Health	Medium to High	Small	Negligible/ Low	N/A	Negligible/Low, Not Significant
		Ecological	Low	Small	Negligible/ Low	N/A	Negligible/Low, Not Significant
Construction Traffic	oCTMP	Human Health	N/A – does not pass IAQM, DEFRA and DMRB thresholds for assessment	N/A – does not pass IAQM, DEFRA and DMRB thresholds for assessment	Negligible – does not pass IAQM, DEFRA and DMRB thresholds for assessment	N/A	Negligible, Not Significant
		Ecological	N/A – does not pass IAQM, DEFRA and DMRB thresholds for assessment	N/A – does not pass IAQM, DEFRA and DMRB thresholds for assessment	Negligible – does not pass IAQM, DEFRA and DMRB thresholds for assessment	N/A	Negligible, Not Significant
Decommissioning Dust	Outlined in Table 12.11 and oDEMP	Human Health	Medium to High	Small	Negligible/ Low	N/A	Negligible/Low, Not Significant
		Ecological	Low	Small	Negligible/ Low	N/A	Negligible/Low, Not Significant
Decommissioning Traffic	oDEMP	Human Health	N/A – anticipated to be the same as for	N/A – anticipated to be the same as for construction phase	Negligible – anticipated to be the same as for	N/A	Negligible, Not Significant

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			construction phase		construction phase		
		Ecological	N/A – anticipated to be the same as for construction phase	N/A – anticipated to be the same as for construction phase	Negligible – anticipated to be the same as for construction phase	N/A	Negligible, Not Significant

12.9 Cumulative Effects

12.9.1 This section assesses the potential cumulative Air Quality effects of the Proposed Development. The methodology of this assessment is presented in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**.

Intra-Cumulative Effects

12.9.2 Intra-cumulative impacts can be defined as those that occur where a single receptor is affected by more than one source of effect arising from different aspects of the Proposed Development. With the implementation of the proposed embedded mitigation, no intra-cumulative effects are anticipated in relation to Air Quality during any phase of the Proposed Development. Intra-cumulative effects, including those relating to Human Health impacts, are presented in **ES Volume 2, Chapter 17: Cumulative Effects Assessment [EN0110020/APP/6.17]**.

Inter-Cumulative Effects

12.9.3 Inter-project effects refer to the impacts that arise from other existing and, or approved developments within reasonable proximity of the Proposed Development, which individually might not be Significant, but when considered together could create a Significant cumulative effect on a shared receptor

12.9.4 As outlined in Section 12.7 air quality construction dust impacts of the as per IAQM methodology from the Proposed Development on local air quality will be Negligible/Low with the application of embedded mitigation. Inter-cumulative dust impacts could potentially occur as a result of construction activities associated with the Proposed Development, and from construction activities associated with developments within the zone of influence (Zol) for air quality (250m from the Proposed Development) but this is only possible if embedded mitigation is not implemented correctly. A shortlist of developments within this Zol has been presented in **Table 12.14**.

Table 12.14: Short List of Cumulative Projects within Air Quality Zone of Influence

Planning Authority	Planning Reference	Description	Distance from the Proposed Development
RMBC	RB2024/0063	Erection of battery storage facility and associated works	Within the Order Limits at CRC
RMBC	RB2024/0321	Erection of battery storage facility and associated works	Within the Order Limits at CRC
RMBC	RB2025/0029	Proposed ground-mounted solar PV arrays, supporting energy infrastructure (including BESS), access improvements and ancillary development including, landscaping and biodiversity enhancements and continued shared agricultural use	Within the Order Limits at W2
RMBC	RB2025/0240	Proposed Battery Energy Storage Scheme (BESS)	Adjacent to Whitestone 3, land

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Planning Authority	Planning Reference	Description	Distance from the Proposed Development
			parcel west of Hard Lane.
RMBC	RB2025/0599	Outline Application for residential development including details of appearance, landscaping, layout and scale.	0.35km east of CRB
RMBC	RB2024/0104	Reserved matters application (details of internal access, landscaping, layout, scale, & appearance) for the erection of 450 dwellinghouses (reserved by outline permission RB2019/0552)	0.76km north of CRE
RMBC	RB2025/0714	Construction, operation, and subsequent decommissioning of a renewable energy park, comprising ground mounted solar PV together with associated infrastructure including inverters, substation compound, cabling, access tracks, fencing, and landscaping	Within the Order Limits at CRC
RMBC	RM2025/0979	Outline application for residential development of up to 349 dwellings including details of the access	0.4km west of CRB
RMBC	RB2025/1420	Outline planning application for the construction of up to 170 dwellings with associated landscaping, open space, drainage infrastructure and associated works (all matters reserved except access from Long Lane)	Adjacent to CRE
RMBC	RB2025/1468	Erection of a new 400kV Gas Insulated Switchgear (GIS) substation including gantries, internal access roads, a GIS building, parking, drainage, emergency diesel generator, lighting and CCTV, permanent access road from Long Lane, earthworks, landscaping and biodiversity enhancement, and fencing and the permanent realignment of Whiston Footpath 10	Within Order Limits at CRE
RMBC	RB2025/1648	Erection of a new substation	0.12km North of W2
RMBC	RB2025/1223	Outline application for residential development with main points of access, all other matters reserved	0.26km east of CRB

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Planning Authority	Planning Reference	Description	Distance from the Proposed Development
RMBC	RB2025/1674	Installation of 2 replacement terminal single poles (application under Overhead Lines (Exemption) (England and Wales) Regulations 2009)	Within Order Limits at W2
CDC	22/00840/SCRE	Request for an EIA screening opinion for the Proposed Mere Flats Solar Energy Supply Project	Adjacent to CRB
CDC	24/01404/FULM	Proposed residential development with public open space, access, landscaping and associated infrastructure.	Adjacent to W1
North East Derbyshire District Council (NEDDC)	25/00377/EIA	Environmental Impact Assessment Screening Opinion Request for a proposed Enercon E82 (3MW) Wind Turbine	0.2km from W3
RMBC	RB2022/1203	Installation and operation of a solar energy park and associated infrastructure.	Adjacent to W2
RMBC	RB2022/1767	Battery energy storage facility and associated works	0.2km south of CRC
RMBC	RB2026/0228	Erection of new substation, associated infrastructure including access, parking, landscaping and temporary construction access	Adjacent to W3
RMBC	RB2025/1478	Conversion of existing stable block to form 2 No. dwellings with demolition of walls to entrance and erection of bin store and 2.4m high fencing adjacent to highway	Adjacent to W2

12.9.5 Construction footprints from other listed developments were considered and assessed and assumed as per IAQM best practice that construction dust impacts are mitigated sufficiently by all developments. It is assumed that nearby construction sites, will operate to a similar level of best practice and in accordance with their own CEMPs. The inter-cumulative effects of dust generation during construction would therefore be **Negligible to Low (Not Significant)** as with embedded mitigation the other developments in the area would also be mitigated to Negligible (or at worst Low). Similar considerations will apply to cumulative traffic emissions associated with the other existing or approved developments. Traffic impacts have been screened out for the Proposed Development so there are no cumulative impacts from the Proposed Development anticipated with other developments in the area during construction.

12.9.6 Operational and maintenance dust impacts of the Proposed Development were scoped out of the assessment as the Proposed Development has no combustion sources on-site as part of regular operation and maintenance, and insufficient

operational traffic volumes to require assessment, therefore no expected cumulative impacts.

- 12.9.7 Decommissioning impacts are expected to be of the same type, magnitude and significance level as the construction phase therefore inter-cumulative dust impacts could potentially occur (i.e. if unmitigated) as a result of multiple activities associated with the Proposed Development, and from activities associated with the short-listed potential developments within the ZOI for air quality. It is assumed that nearby construction sites, will operate to a similar level of best practice and in accordance with their own CEMPs or DEMP depending on the stage of development. The inter-cumulative effects of dust generation during decommissioning would therefore be **Negligible to Low (Not Significant)** as with embedded mitigation the other developments in the area would also be mitigated to Negligible (or at worst Low). Cumulative impacts from traffic emissions associated with other existing or approved developments are unable to be assessed at this point and will be considered in the future through the DEMP.

12.10 Summary

12.10.1 The assessment in this ES concludes the following.

- Construction dust: impacts are predicted to be **Negligible**, or at worst **Low**, and therefore **Not Significant**, with the correct implementation of the recommended embedded mitigation on sensitive human receptors or ecological receptors;
- Construction traffic: predicted effects to be **Negligible** impacts and therefore **Not Significant** on sensitive human receptors or ecological receptors; and
- Decommissioning: impacts are predicted to be **Negligible**, or at worst **Low**, and therefore **Not Significant**, with the correct implementation of the recommended embedded mitigation.

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