

Report
Air Quality Assessment
Rossendale BESS

For Cubico UK Developments Ltd
10 March 2025

Document Control

Project Title:	Air Quality Assessment
Project Number:	J10-16119A-10
Client:	Cubico UK Developments Ltd
Principal Contact:	Steven Healey (Turley)
Document Title:	Rossendale BESS
Document Number:	J10-16119A-10-1-F3
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Revision History

01	13/12/2024	First Issue
02	18/12/2024	Updated Redline Boundary and Site name
03	04/03/2025	Updated naming conventions
04	10/03/2025	Updated to text



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1 Introduction

- 1.1 This report describes the potential air quality impacts associated with the proposed 85 MW Battery Energy Storage System (hereafter referred to as 'Rossendale BESS') development at Land at Rochdale Road and Bamford Road, Turn Village. The ROSSENDALE BESS development description is as below:

'Construction, management and operation of a Battery Energy Storage System (ROSSENDALE BESS) with associated infrastructure, including access, drainage, security measures and landscaping and provision of a connecting cable to Croston Close Road substation'

- 1.2 The proposed development lies within Rossendale Borough Council (hereafter referred to as 'RBC'). The site is not located within an Air Quality Management Area (AQMA); the nearest being the Greater Manchester Combined Authority's AQMA (within the Bury Metropolitan Borough Council administrative area), declared for exceedance of the annual mean nitrogen dioxide (NO₂) objective, located 2 km west along the M66 and around 800m beyond that along the A676.
- 1.3 The location and setting of the proposed development is shown in Figure 1.

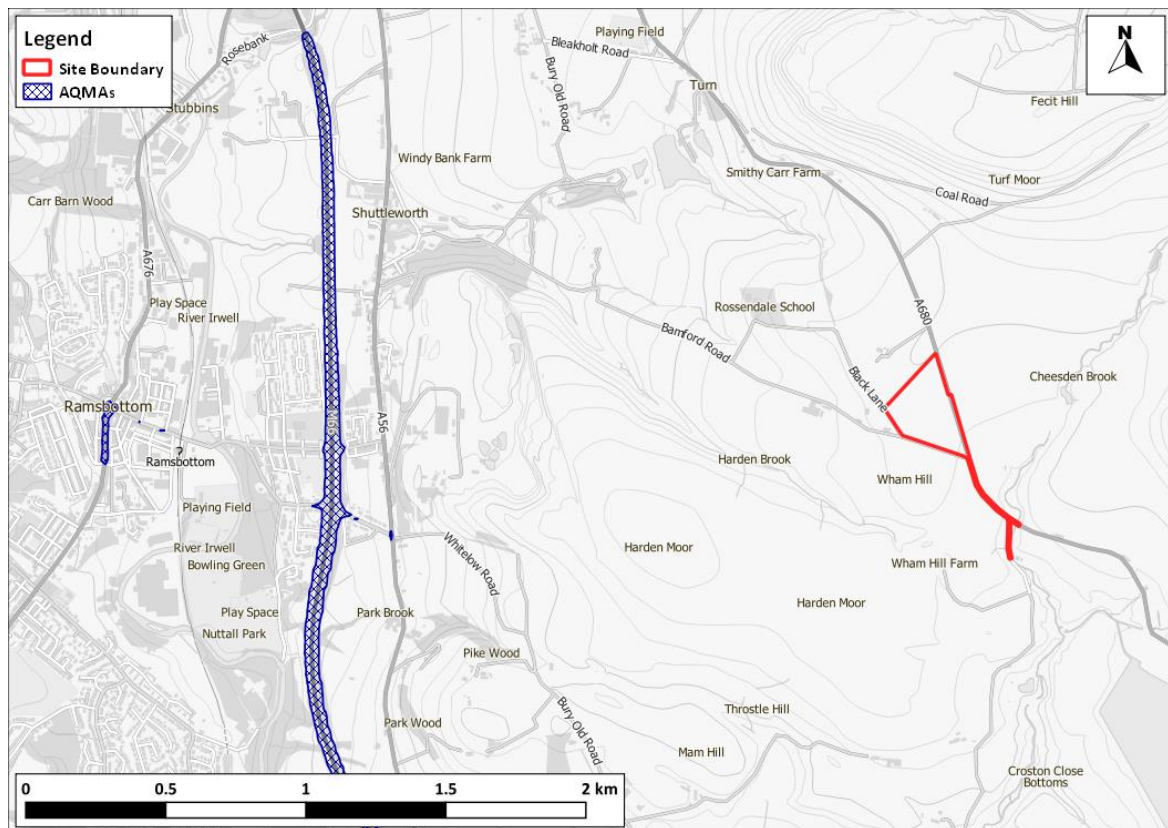


Figure 1: Proposed Development Setting in the Context of Air Quality

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- 1.4 Air quality needs to be considered to ensure that the development does not generate any adverse impacts off site.

- 1.5 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM)¹ recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality effects. The approach, as described in Appendix A1 first considers the size of a development; if the development is for fewer than ten homes or covers less than 1,000 m² of other land uses and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment. The proposed development is above the development size, and therefore the potential impacts on air quality from traffic generated by the development needs to be considered. The IAQM have set out screening criteria, below which it can be assumed that there will be significant impacts on air quality. The criteria for outside an AQMA are a change in traffic flows of more than 500 AADT of LDV or more than 100 AADT HDV.
- 1.6 The energy strategy for the proposed development is for all energy supply to be electric; there will be no centralised combustion plant and thus there will be no significant point sources of emissions within the proposed development.
- 1.7 The development design does not currently include any backup-power or emergency-power generators. Should these be added at a later stage, the impacts from the plant emissions may necessitate further assessment.
- 1.8 This report has been prepared taking into account all relevant local and national guidance and regulations.
- 1.9 There is also the potential for the construction activities to impact upon existing properties. The main pollutants of concern related to construction activities are dust and PM₁₀.

¹ The IAQM is the professional body for air quality practitioners in the UK.

2 Policy Context

2.1 All European legislation referred to in this report is written into UK law and remains in place. The following Policy, Legislation and Guidance has been followed when preparing this document. For details of each, please see Appendix A2

- Air Quality Strategy 2007
- Air Quality Strategy 2023
- Clean Air Strategy 2019
- Environment Act 2021
- Environmental Improvement Plan 2023
- Planning Policy
- Local Transport Plan
- Local Policies
- Air Quality Action Plans
 - i) National Air Quality Plan
 - ii) Local Air Quality Action Plan

3 Pollutants of Concern

- 3.1 The main air pollutants of concern are nitrogen dioxide (NO₂) and fine particulate matter (PM₁₀ and PM_{2.5}). These are the pollutants most related to road traffic emissions and known to have adverse health impacts. UK-wide objectives for nitrogen dioxide and PM₁₀ were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter.
- 3.2 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. Defra explains where these objectives will apply in its Local Air Quality Management Technical Guidance (Defra, 2022). The annual mean objectives for nitrogen dioxide and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals etc.; they do not apply at hotels. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and at hotels. The 1-hour mean objective for nitrogen dioxide applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 3.3 For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value², originally set at 25 µg/m³ and currently set at 20 µg/m³.
- 3.4 Defra has also recently set two new targets, and two new interim targets, for PM_{2.5} concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by the end of 2040 (referred to as the annual mean concentration target or AMCT), with the interim target being a value of 12 µg/m³ by the start of 2028³. The second set of targets relate to reducing overall population exposure to PM_{2.5}. By the end of 2040, overall population exposure to PM_{2.5} should be reduced by 35% compared with 2018 levels (referred to as the population exposure reduction target or PERT), with the interim target being a reduction of 22% by the start of 2028.
- 3.5 In November 2024 Defra published Interim Planning Guidance on the PM_{2.5} targets (Defra, 2024). This states that:
- "The purpose of the targets is to improve air quality by reducing levels of PM_{2.5} across the country, therefore improving public health. While achievement of the targets will be assessed at relevant monitoring sites, the targets apply to ambient (outdoor) air throughout England. Applicants and Local Planning Authorities should therefore consider the impact of developments on air quality in all ambient air, whether a monitor is present or not."*
- 3.6 In order to address the new targets it is not sufficient to assess solely whether a scheme is likely to lead to an exceedance of a legal limit. Instead, developments need to implement appropriate mitigation

² EU Directive 2008/50/EC sets limit values for NO₂, PM₁₀ and PM_{2.5}, and is implemented in UK law through the Air Quality Standards Regulations (2010). The limit values for NO₂ and PM₁₀ are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values.

³ Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m³ would not exceed the 10 µg/m³ target.

measures from the design stage, ensuring the minimum amount of pollution is emitted and that exposure is minimised.

- 3.7 Pending publication of the new guidance, Defra advises applicants to provide evidence that they have identified key sources of air pollution within the scheme and taken appropriate action to minimise emissions of PM_{2.5} and its precursors as far as possible. More detailed assessment is expected for development closer to populations and/or having higher emissions. Defra has posed two questions to be used as prompts to support the interim assessment process:

“How has exposure to PM_{2.5} been considered when selecting the development site?; and

What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?”

- 3.8 The relevant air quality criteria for this assessment are provided in Table 1 and Table 2.

Table 1: Air Quality Criteria for Nitrogen Dioxide, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Value
Nitrogen Dioxide	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³ ^a
PM _{2.5}	Annual Mean	20 µg/m ³ ^b

^a A proxy value of 32 µg/m³ as an annual mean is used in this assessment to assess the likelihood of the 24-hour mean PM₁₀ objective being exceeded. Measurements have shown that, above this concentration, exceedances of the 24-hour mean PM₁₀ objective are possible (Defra, 2022).

^b There is no numerical PM_{2.5} objective for local authorities (see Paragraph 3.3). Convention is to assess against the UK limit value which is currently 20 µg/m³.

Table 2: Environment Act PM_{2.5} Targets

Metric	Target	Target year
AMCT	Interim target: 12 µg/m ³	2028
	Legally binding target: 10 µg/m ³	2040
PERT	Interim target: 22% reduction in exposure compared to 2018	2028
	Legally binding target: 35% reduction in exposure compared to 2018	2040

4 Baseline Conditions

Relevant Features

- 4.1 The proposed development is located approximately 2 km to the east of the town of Ramsbottom. The application site is bounded by Rochdale Road to the east, Bamford Road to the south and Black Lane to the west. It currently consists of agricultural land used for pasture.
- 4.2 There are existing farmhouses adjacent to the northern and western borders of the site, with Rossendale School 600 m to the north-west. Fletcher Bank Quarry, located in Ramsbottom is located to 1 km to the west of the Site.

Industrial Sources

- 4.3 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Background Concentrations

- 4.4 Background concentrations have been defined using Defra's 2021-based background maps (Defra, 2024). These cover the whole of the UK on a 1x1 km grid. Mapped background concentrations of PM₁₀ and PM_{2.5} have not been adjusted.
- 4.5 Estimated background concentrations at the proposed development in the anticipated year of opening of the proposed development are set out in Table 3 and are all well below the objectives. A range of values is presented as the study area covers multiple 1x1 km grid squares.

Table 3: Estimated Annual Mean Background Pollutant Concentrations in 2025 (µg/m³)

Year	NO ₂	PM ₁₀	PM _{2.5}
2025	7.4	9.7	5.7
Objective	40	40	20 ^a
AMCT^b	-	-	10
^a The 20 µg/m ³ PM _{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. ^b To be met by 2040			

5 Construction Phase Assessment

Construction Impacts Approach

- 5.1 The construction dust assessment considers the potential for impacts within 250 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology is based on information provided by IAQM (2024). This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. Appendix A3 explains the approach in more detail.
- 5.2 Guidance from IAQM (2024) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

Construction Traffic

- 5.3 It is anticipated that no more than four heavy vehicles will access the site on any given day, thus the additional heavy vehicle movements on local roads will be well below the 100 AADT screening criterion recommended by EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017). It is, therefore, not considered necessary to assess the impacts of traffic emissions during the construction phase and it can be concluded that the proposed development will not have a significant impact on local roadside air quality as a result of construction traffic emissions.

On-Site Exhaust Emissions

- 5.4 The IAQM guidance (IAQM, 2024) states:

"Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur".

The proposed development site is moderate in size (approximately 54,000 m²), with the majority of the site area is more than 50 m from any sensitive receptors. The areas in which NRMM and site traffic will typically operate are thus likely to be located more than 50 m away from any sensitive properties. It is judged that there no risk of significant effects at existing receptors as a result of on-site machinery emissions.

Construction Dust and Particulate Matter Emissions

- 5.5 The construction works will give rise to a risk of dust impacts during earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a risk assessment. There are receptors within the distances set out in the guidance (see Appendix A3), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition

- 5.6 There is no requirement for demolition on site.

Earthworks

- 5.7 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website (British Geological Survey, 2024), as set out in Table 4. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table 4: Summary of Soil Characteristics

Category	Record
Soil Layer Thickness	Deep
Soil Parent Material Grain Size	Mixed (Argillaceous ^a – Rudaceous ^c)
European Soil Bureau Description	Glacial Till
Soil Group	Medium to Light (Silty) to Heavy
Soil Texture	Clayey Loam to Silty Loam ^d

^a grain size < 0.06 mm.

^b grain size > 2.0 mm.

^c a loam is composed mostly of sand and silt.

- 5.8 The development area covers approximately 15,000 m², of which the majority will be subject to earthworks. This involves the removal of topsoil and arisings. Dust will arise mainly from vehicles travelling over unpaved ground and from the handling of dusty materials (such as dry soil). Based on the example definitions set out in Table A3-1 in Appendix A1, the dust emission class for earthworks is considered to be *small*.

Construction

- 5.9 The proposed development involves the construction of a BESS, pond and a small substation, with a total building volume of around 5,000 m³. Dust will arise from vehicles travelling over unpaved ground, the handling and storage of dusty materials, and from the cutting of concrete. Based on the example definitions set out in Appendix A3, the dust emission class for construction is considered to be *small*.

Trackout

- 5.10 The site is likely to involve a maximum of two outward heavy vehicle movements per day. Based on the example definitions set out in Table A3-1 in Appendix A3, the dust emission class for trackout is considered to be *small*.
- 5.11 Table 5 summarises the dust emission magnitude for the proposed development.

Table 5: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	N/A
Earthworks	Small

Source	Dust Emission Magnitude
Construction	Small
Trackout	Small

Sensitivity of the Area

- 5.12 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM₁₀ concentrations.
- 5.13 The IAQM guidance, explains that residential properties are 'high' sensitivity receptors to dust soiling, while places of work is a 'medium' sensitivity receptor (Table A3-2 in Appendix A3). There is one residential property within 100 m of the site and three within 250 m, there is one place of work (the joinery to the south west) located within 50 m (see Figure 2).

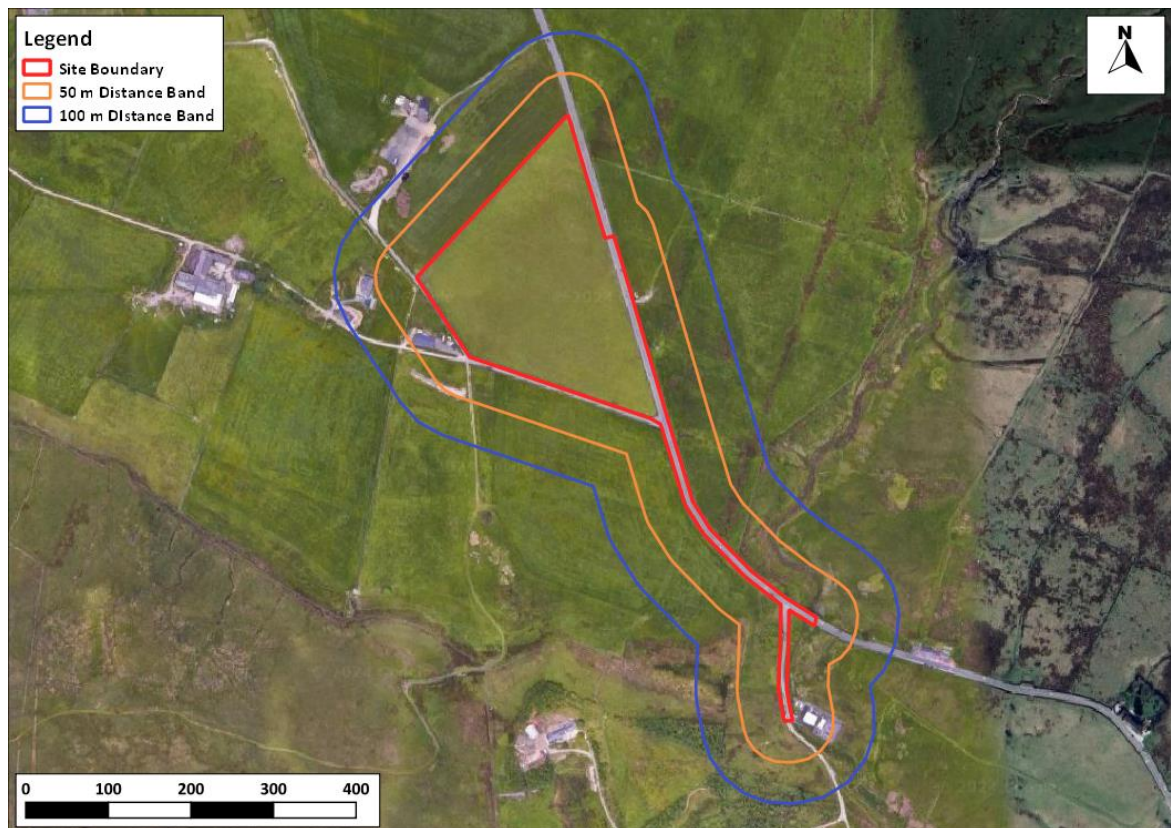


Figure 2: 50 m and 100 m Distance Bands around the Site Boundary

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- 5.14 The IAQM guidance (IAQM, 2024) explains that there is a risk of material being tracked 250 m from the site exit; pragmatically, this also includes locations where works are likely to take place, such as along the cable route and at the off-site substation. It is not known which roads construction vehicles will use, however it has been assumed, based on the surrounding road network, the HGVs will travel along A680 Rochdale Road and Edendale Road, as other routes near to the site are unlikely to be

suitable for HGVs. The map plans indicate the construction route will be from the north-eastern corner of the site, as well as from the road where the connecting cable will be laid. There are three residential properties within 20m of roads along which material could be tracked (see Figure 3).

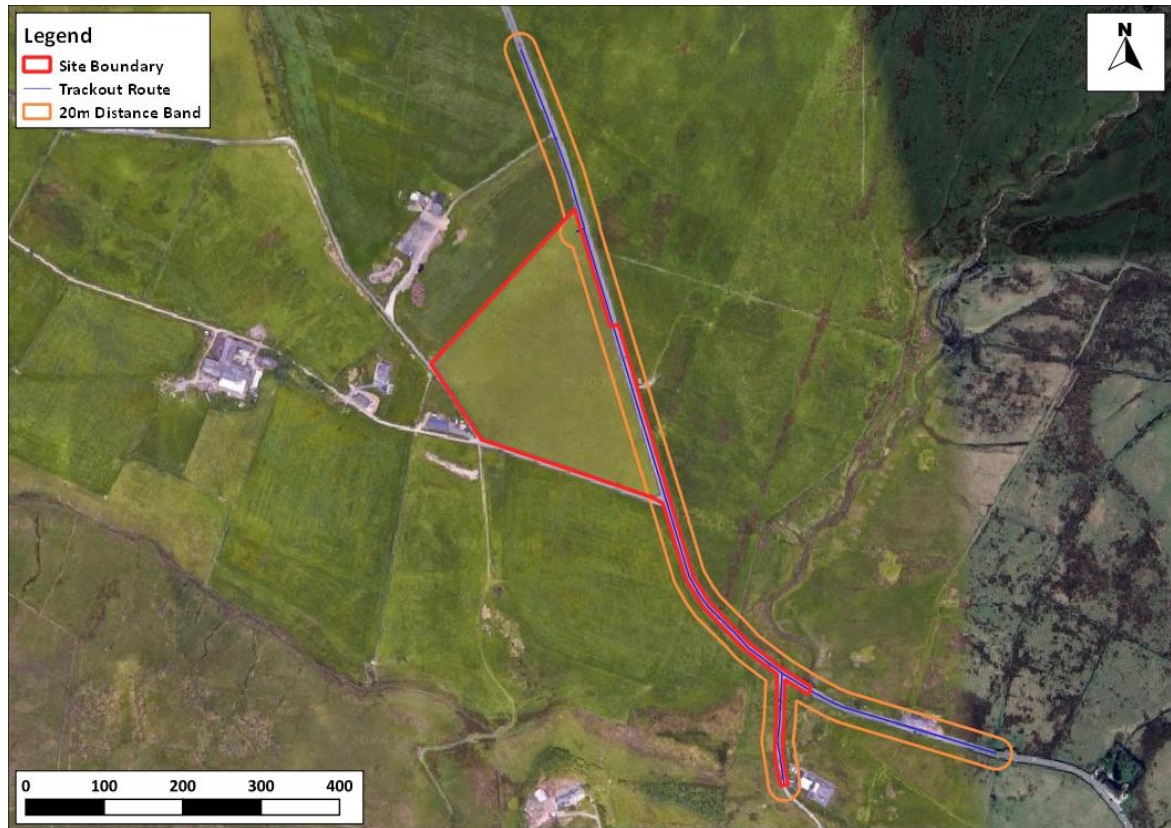


Figure 3: 20 m Distance Band around Roads Used by Construction Traffic Within 250 m of the Site Exit and Site Boundary

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Sensitivity of the Area to Effects from Dust Soiling

- 5.15 Using the information set out in Paragraph 5.13 and Figure 2 alongside the matrix set out in Table A3-3 in Appendix A3, the area surrounding the onsite works is of 'low' sensitivity to dust soiling. Using the information set out in Paragraph 5.14 and Figure 3 alongside the same matrix, the area is also 'medium' sensitivity to dust soiling due to trackout.

Sensitivity of the Area to any Human Health Effects

- 5.16 The matrix in Table A3-4 in Appendix A3 requires information on the baseline annual mean PM₁₀ concentration in the area. The properties nearest the site are away from local roads and the existing annual mean PM₁₀ concentration is best described by the background concentration from Table 3 (9.7 µg/m³). Using the information set out in Paragraphs 5.13 and Figure 2 alongside the matrix in Table A3-4 in Appendix A3, the area surrounding the onsite works is of 'low' sensitivity to human health effects. Using the information set out in Paragraph 5.14 and Figure 3 alongside the same matrix, the area surrounding roads along which material may be tracked from the site is also 'low' sensitivity.

Sensitivity of the Area to any Ecological Effects

- 5.17 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary or those roads along which material may be tracked, thus ecological impacts will not be considered further.

Summary of the Area Sensitivity

- 5.18 Table 6 summarises the sensitivity of the area around the proposed construction works.

Table 6: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	Trackout
Dust Soiling	Low Sensitivity	Medium Sensitivity
Human Health	Low Sensitivity	Low Sensitivity

Risk and Significance

- 5.19 The dust emission magnitudes in Table 5 have been combined with the sensitivities of the area in Table 6 using the matrix in Table A3-6 in Appendix A3, in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 7. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 7 (step 3 of the assessment procedure).

Table 7: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health
Earthworks	Negligible	Negligible
Construction	Negligible	Negligible
Trackout	Low Risk	Negligible

- 5.20 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant' (IAQM, 2024).

6 Operational Phase Assessment

- 6.1 Although operational data has not been made available, from professional experience, the proposed development is expected to generate less than one AADT (1 to 2 maintenance trips per month); these daily trip rates are below the screening threshold of 100 HDVs or 500 LDVs recommended for use outside of an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Appendix A1). The proposed development will generate very few operational heavy vehicle trips. As such, it is judged that the relevant screening thresholds will not be exceeded and there is no requirement for a detailed assessment of road traffic impacts at existing receptors; it can be concluded that the proposed development will not have a significant impact on local roadside air quality.

7 Mitigation

Good Design and Best Practice

- 7.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required.
- 7.2 The EPUK/IAQM guidance predates the recent publication by Defra of long-term air quality targets for PM_{2.5}. While it is not appropriate to determine individual planning applications based on whether future PM_{2.5} concentrations in an area will be above or below the concentration target, it is nevertheless appropriate that new development contributes to meeting the national targets by ensuring that air quality is taken into account in development design.
- 7.3 The proposed development incorporates the following good design and best practice measures:
- adoption of a Dust Management Plan (DMP) or Construction Environmental Management Plan (CEMP) to minimise the environmental impacts of the construction works;
 - all electric energy strategy; and
 - the proposed development is built in the south-east of the site, which is the furthest possible location from the few local sensitive receptors located to the west and north of the site. Thus, minimising any potential dust nuisance and elevated PM₁₀ and PM_{2.5} concentrations associated with the construction phase.

Recommended Mitigation

Construction Impacts

- 7.4 Measures to mitigate dust emissions will be required during the construction phase of the development in order to minimise effects upon nearby sensitive receptors, despite being low risk.
- 7.5 The site has been identified as Low Risk during trackout, as set out in Table 7. Comprehensive guidance has been published by IAQM (2024) that describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on monitoring during demolition and construction (IAQM, 2018). This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A4.
- 7.6 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.

8 Achieving Compliance with the AMCT and PERT

- 8.1 The annual mean PM_{2.5} background concentrations are below the AMCT target to be met by 2040.
- 8.2 Defra have set out in their Interim Planning Guidance (Defra, 2024) two questions designed to consider whether a development supports the AMCT and PERT PM_{2.5} targets.

The first question is *“How has exposure to PM_{2.5} been considered when selecting the development site?”*.

- 8.3 Exposure to PM_{2.5} has been considered in the design of the development as the site is in a rural area away from large populations of people. As outlined in Paragraph 4.3, following the study of the pollution and transfer register (Defra, 2022), no significant industrial sources have been identified that are likely to affect the proposed development in terms of dust and PM_{2.5} concentrations. Exposure to and emissions of PM_{2.5} have been considered in the construction phase, and exposure is likely to be low with respect to trackout as construction traffic is expected to be well below the screening threshold published by the IAQM.

The second question is *“What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?”*.

- 8.4 Construction mitigation has been proposed, in Appendix A4, despite the site being low risk following a construction dust risk assessment. These should be followed, as far as reasonably practicable to reduce dust emissions, for which a component of dust is PM_{2.5}.
- 8.5 Cumulative impacts increase overall regional PM_{2.5} exposure, thus a significant issue in the UK with respect to public health impacts and progress towards the concentration targets. With this in mind, implemented design and best practice measures have been outlined; these measures will reduce the overall PM_{2.5} emissions produced as a result of the proposed development, so, as these emissions are likely to be small, the development has been shown to consider the associated impacts from cumulative effects associated with several small PM_{2.5} emitting sites by trying to minimise its own emissions.
- 8.6 It is considered that the development complies with the requirements to deliver achievement of the AMCT and PERT by 2040 as appropriate action has been taken to minimise emissions of PM_{2.5} and its precursors as far as is reasonably practicable.

9 Conclusions

- 9.1 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction and emissions from road traffic generated by the completed development.

Construction Impacts

- 9.2 The construction works have the potential to create dust. During construction it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any residual effects will be 'not significant'.

Operational Impacts

- 9.3 The traffic generated by the proposed development will be below industry screening thresholds and it will not introduce any combustion sources. Thus, the proposed development will have a negligible impact on air quality conditions at all existing receptors.

Mitigation

- 9.4 Measures to reduce emissions have been applied in the form of a potential CEMP or DMP and an all-electric energy strategy in the form of a substation. The development will have no adverse effects on local air quality, thus no additional mitigation has been proposed for the operational impacts.

Significance

- 9.5 The overall air quality effects of the proposed development are judged to be 'not significant'. This conclusion is based on the emissions sources being below screening criteria.

Policy Implications

- 9.6 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 198 of the NPPF, being appropriate for its location in terms of its effects on the local air quality environment. It is also consistent with Paragraph 199, as it will not affect compliance with relevant limit values or national objectives.
- 9.7 The proposed development is also consistent with Policy TR1: Strategic Transport in RBC's Local Plan (Rossendale Borough Council, 2021) as it will support economic growth while improving air quality and tackling climate change. To transition to a net-zero electricity system and to achieve energy security, utility-scale Rossendale BESS', such as the present, will be required to meet existing and future energy needs, whilst combatting climate change through providing zero emission energy storage and supply.

10 References

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11 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
CEMP	Construction Environmental Management Plan
Defra	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
kW	Kilowatt
LDV	Light Duty Vehicles (<3.5 tonnes)
µg/m ³	Microgrammes per cubic metre
NO ₂	Nitrogen dioxide
NPPF	National Planning Policy Framework
OEP	Office for Environmental Protection
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM ₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM _{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

12 Appendices

A1 EPUK & IAQM Planning for Air Quality Guidance

A1.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

“Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:

- the severity of the impacts on air quality;
- the air quality in the area surrounding the proposed development;
- the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and
- the positive benefits provided through other material considerations”.

Recommended Best Practice

A1.2 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

“The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions”.

A1.3 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m² of commercial floorspace;
- are carried out on land of 1 ha or more.

A1.4 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new “street canyon”, as this inhibits pollution dispersion;
- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;

- The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1000 m² of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNO_x/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:
 - iii) Spark ignition engine: 250 mgNO_x/Nm³;
 - iv) Compression ignition engine: 400 mgNO_x/Nm³;
 - v) Gas turbine: 50 mgNO_x/Nm³.

A1.5 A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNO_x/Nm³ and 25 mgPM/Nm³.

A1.6 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

"It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the "damage cost approach" used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential".

A1.7 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

"There may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular nitrogen dioxide), that would cause unacceptably high exposure for users of the new development; and
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development".

Impacts of the Development on the Local Area

A1.8 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha.

A1.9 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A1.10 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;

- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A1.11 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A1.12 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

"Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NO_x gas boiler or a 30kW CHP unit operating at <95mg/Nm³.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable".

A1.13 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality".

A1.14 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

"The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer".

A1.15 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

- A1.16 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:
- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
 - a judgement on the overall significance of the effects of any impacts.
- A1.17 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either 'significant' or 'not significant'. In drawing this conclusion, the following factors should be taken into account:
- the existing and future air quality in the absence of the development;
 - the extent of current and future population exposure to the impacts;
 - the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
 - the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
 - the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.
- A1.18 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.
- A1.19 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A5.

A2 Policy

Air Quality Strategy 2007

- A2.1 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives.

Air Quality Strategy 2023

- A2.2 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023a) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

- A2.3 The Clean Air Strategy (Defra, 2019a) sets out a wide range of actions by which the UK Government, in partnership with the Governments of Scotland, Wales and Northern Ireland, will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Environment Act 2021

- A2.4 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the government to account and ensuring compliance with these targets.
- A2.5 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of PM_{2.5}. These targets are described in Paragraph 3.4.

Environmental Improvement Plan 2023

- A2.6 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018a). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023b) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.
- A2.7 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of PM_{2.5}. These targets, which are described in more detail in Paragraph 3.4, include the long-term targets in the Statutory Instrument described in Paragraph A2.5, and interim targets to be achieved by 2028.
- A2.8 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the Department for Transport in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

National Policies

- A2.9 The National Planning Policy Framework (NPPF) (2024) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".

- A2.10 To prevent unacceptable risks from air pollution, Paragraph 187 of the NPPF states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management planst".

- A2.11 Paragraph 198 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development".

- A2.12 More specifically on air quality, Paragraph 199 makes clear that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas."

- A2.13 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality.

- A2.14 The PPG sets out the information that may be required in an air quality assessment, making clear that:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

Local Policies

- A2.15 Rossendale Local Plan 2019-2036 (Rossendale Borough Council, 2021) was adopted on the 15th December 2021, and within this there are two policies which refer to air quality. Strategic policy TR1: Strategic Transport refers to sustainable transport and states that RBC aim:

"To enhance connectivity, support economic growth while improving air quality and tackling climate change"

- A2.16 Policy ENV6 for environmental protection states:

"Undertaking Air Quality Assessments to the satisfaction of the Council for proposals which have the potential to have a significant adverse impact on air quality...and implementing measures such as Travel Plans, dust suppression techniques and the incorporation of electric car charging points to both mitigate the effects of the development on air quality and to ensure that the users of the development are not significantly adversely affected by the air quality"

Air Quality Action Plans

National Air Quality Plan

- A2.17 Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018b) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

- A2.18 RBC's Air Quality Annual Status Report for 2023 (Rossendale Borough Council, 2023) states that the two AQMA's declared by RBC, at Manchester Road and Bacup Road, have been revoked due to being under the NO₂ annual mean objective for over three years. A new AQMA has been declared on the 7th December 2022 in an area of Grane Road, Haslingden, for exceedances of the annual mean NO₂ objective. However, as of yet, no air quality action plan has been produced for this AQMA. The Grane Road AQMA is not located near to the site.

A3 Construction Dust Assessment Procedure

A3.1 The criteria developed by IAQM (2024) divide the activities on construction sites into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

A3.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

A3.3 An assessment is required where there is a human receptor within 250 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s), or where there is an ecological receptor within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

A3.4 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is *negligible* and that any effects will be 'not significant'. No mitigation measures beyond those required by legislation will be required.

STEP 2: Assess the Risk of Dust Impacts

A3.5 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and
- the sensitivity of the area to dust effects (Step 2B).

A3.6 These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

Step 2A – Define the Potential Dust Emission Magnitude

A3.7 Dust emission magnitude is defined as either 'Small', 'Medium', or 'Large'. The IAQM guidance explains that this classification should be based on professional judgement, but provides the examples in Table A3-1.

Table A3-1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
Large	Total building volume >75,000 m ³ , potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities >12 m above ground level

Class	Examples
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material, demolition activities 6-12 m above ground level
Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	
Large	Total site area >110,000 m ² , potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.
Medium	Total site area 18,000 m ² – 110,000 m ² , moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height.
Small	Total site area <18,000 m ² , soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.
Construction	
Large	Total building volume >75,000 m ³ , on site concrete batching; sandblasting
Medium	Total building volume 12,000 m ³ – 75,000 m ³ , potentially dusty construction material (e.g. concrete), on site concrete batching
Small	Total building volume <12,000 m ³ , construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout ^a	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m
Medium	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m
Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

^a These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B – Define the Sensitivity of the Area

A3.8 The sensitivity of the area is defined taking account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM₁₀, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

A3.9 The first requirement is to determine the specific sensitivities of local receptors. The IAQM guidance recommends that this should be based on professional judgment, taking account of the principles in Table A3-2. These receptor sensitivities are then used in the matrices set out in Table A3-3, Table A3-4

and Table A3-5 to determine the sensitivity of the area. Finally, the sensitivity of the area is considered in relation to any other site-specific factors, such as the presence of natural shelters etc., and any required adjustments to the defined sensitivities are made.

Step 2C – Define the Risk of Impacts

- A3.10 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the *risk* of impacts with no mitigation applied. The IAQM guidance provides the matrix in Table A3-6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

- A3.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance has been used as the basis for the requirements set out in Appendix A4.

STEP 4: Determine Significant Effects

- A3.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.
- A3.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

Table A3-2: Principles to be Used When Defining Receptor Sensitivities

Class	Principles	Examples
Sensitivities of People to Dust Soiling Effects		
High	users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	dwelling, museum and other culturally important collections, medium and long term car parks and car showrooms
Medium	users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land	parks and places of work
Low	the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads
Sensitivities of People to the Health Effects of PM₁₀		
High	locations where members of the public may be exposed for eight hours or more in a day	residential properties, hospitals, schools and residential care homes
Medium	locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	may include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀
Low	locations where human exposure is transient	public footpaths, playing fields, parks and shopping streets
Sensitivities of Receptors to Ecological Effects		
High	locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species	Special Areas of Conservation with dust sensitive features

Class	Principles	Examples
Medium	locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition	Sites of Special Scientific Interest with dust sensitive features
Low	locations with a local designation where the features may be affected by dust deposition	Local Nature Reserves with dust sensitive features

Table A3-3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A3-4: Sensitivity of the Area to Human Health Effects ⁴

Receptor Sensitivity	Annual Mean PM ₁₀	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m ³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

⁴ For demolition, earthworks and construction, distances are taken either from the dust source or from the boundary of the site. For trackout, distances are measured from the sides of roads used by construction traffic. Without mitigation, trackout may occur from roads up to 250 m, as measured from the site exit. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Receptor Sensitivity	Annual Mean PM ₁₀	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
Medium	>32 µg/m ³	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m ³	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m ³	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table A3-5: Sensitivity of the Area to Ecological Effects ⁴

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

Table A3-6: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Sensitivity of the <u>Area</u>	Dust Emission Magnitude		
	Large	Medium	Small
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

A4 Construction Mitigation

A4.1 Table A4-1 sets out a list of best-practice measures from the IAQM guidance (IAQM, 2024) that should be incorporated into the specification for the works. These measures should ideally be written into a Dust Management Plan. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the Dust Management Plan.

Table A4-1: Best-Practice Mitigation Measures Recommended for the Works

Measure	Desirable	Highly Recommended
Communications		
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager		✓
Display the head or regional office contact information		✓
Dust Management Plan		
Develop and implement a Dust Management Plan (DMP) approved by the Local Authority which documents the mitigation measures to be applied, and the procedures for their implementation and management	✓	
Site Management		
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken		✓
Make the complaints log available to the local authority when asked		✓
Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book		✓
Monitoring		
Undertake daily on-site and off-site inspections where receptors (including roads) are nearby, to monitor dust. Record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary	✓	
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked		✓
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when		✓

Measure	Desirable	Highly Recommended
activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions		
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 is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction (IAQM, 2018)		✓
Preparing and Maintaining the Site		
Plan the 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 their engines when stationary – no idling vehicles		✓
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable		✓
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced 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)	✓	
Operations		
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such		✓

Measure	Desirable	Highly Recommended
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, 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		
Avoid bonfires and burning of waste materials		✓
Measures Specific to 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	✓	
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable)	✓	

A5 Professional Experience

Dr Jessica Muirhead, BSc (Hons), MSc, PhD, CSci, MEnvSci, MIAQM

Dr Muirhead is an Associate Director with AQC with over 18 years experience in Air Quality consultancy. Prior to joining AQC in 2024, she spent eleven years at AECOM leading the Air Quality Team's Urban Regeneration and Solar Farm work streams. She has been responsible for delivering numerous air quality assessments for planning applications and Development Consent Orders (DCOs) including Environmental Impact Assessments (EIAs) across London and the UK. She spent a year as Technical Advisor to the Greater London Authority delivering training workshops to the London Boroughs, reviewing referable planning applications and responding to queries on air quality positive and air quality neutral. Jess also has extensive experience providing technical peer reviews for a number of Planning Authorities in the UK, and for The Royal Commission for Al Ula in Saudi Arabia.

Suzanne Hodgson, BSc (Hons) MSc CSci MEnvSc MIAQM

Ms Hodgson is a Principal Consultant with AQC, with more than 17 years' experience in the field of air quality management and assessment. She has been responsible for a wide range of air quality projects covering impact assessments for new residential, commercial and industrial developments, EIA development, local air quality management, ambient air quality monitoring of various pollutants, including data ratification, and the assessment of nuisance odours and construction dust. She has extensive modelling experience, including the modelling of road traffic, energy centres (including energy from waste) and odour sources, and is familiar with preparing stand-alone air quality reports as well as chapters for inclusion within an Environment Statement. Suzanne has worked with a variety of clients to provide expert air quality services and advice, including local authorities, planners, developers and process operators. She is a Member of the Institute of Air Quality Management and is a Chartered Scientist.

Owen Dudman, BSc(Hons) MChem

Mr Dudman is an Assistant Consultant with AQC and joined the company in 2024. During his Chemistry integrated master's degree (MChem) at the University of Leeds, Owen developed a keen interest in air quality, atmospheric chemistry, and their impacts on the environment and human health. This led him to specialise in these areas for his master's project, where he completed a year-long, open-ended research project using laser apparatus. Key areas of interest were gaining new information on emissions from biodiesel combustion, with its consumption soaring, and evaluating the effects multifunctional compounds forming secondary organic aerosols have on air quality degradation.



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