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Environmental Associates

Air Quality Assessment

Wyndham Place, Egremont

January 2024

Aldi Stores Ltd

Air Quality Assessment

Wyndham Place, Egremont

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NJD Environmental Associates LTD

www.njdenvironmental.co.uk

Company Registration No 10956987

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1 INTRODUCTION

1.1.1 NJD Environmental Associates Ltd was instructed by Aldi Stores Ltd to prepare an Air Quality Assessment, to inform a planning application for a proposed food store (the 'Proposed Development') located on land south of Wyndham Place in Egremont (the 'Site').

1.1.2 The Site is located in an area where air quality is mainly influenced by road traffic emissions along the A595 Egremont Bypass and the local road network. A map of the Site and surrounding area is shown in Figure 1.

1.1.3 This report determines existing baseline conditions in the vicinity of the Site and provides an assessment of potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases, the type, source and significance of potential air quality impacts are identified, and the mitigation measures that should be implemented to minimise these described.

1.1.4 Ambient pollutant concentrations, namely nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$), are considered at existing sensitive receptor (ESR) locations in the vicinity of the Site.

2 LEGISLATION, POLICY AND GUIDANCE

2.1 Air Quality Legislation

Air Quality Strategy (2023)

2.1.1 The Air Quality Strategy for England is a strategic framework that fulfils the statutory requirement of the Environment Act 1995, as amended by the Environment Act 2021. The Strategy is aimed at local authorities, giving them a heightened level of responsibility to improve air quality in their areas of jurisdiction. The Strategy requires them to actively consider potential air quality implications of any new proposed development, with a focus on pollution prevention and improvement of local air quality throughout the planning process.

2.1.2 The Air Quality Strategy contains standards, objectives and measures for improving ambient air quality, including the ambitious new targets for fine particulate matter ($PM_{2.5}$) set out in the Environment Act 2021.

Air Quality Standards Regulations (2016)

2.1.3 The Air Quality Standards (Amendment) Regulations 2016 amend the Air Quality Standards Regulations 2010 that transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. The regulations aim to protect human health and the environment by providing air quality limit values for seven pollutants and target values for an additional five pollutants.

2.1.4 Table 1 provides the air quality objectives (AQOs) for the pollutants considered within the assessment.

Table 1 - Air Quality Objectives

Pollutant	Concentration (µg/m³)	Averaging Period
NO_2	40	Annual mean
	200	1-hour, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	20	Annual mean

2.2 National Planning Policy

National Planning Policy Framework

2.2.1 The revised National Planning Policy Framework (NPPF), dated December 2023, sets out the Government's core policies and principles with respect to land use planning, including air quality.

2.2.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to achieve this, the NPPF recognises three overarching objectives, including the following of relevance to air quality:

> *"c) 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."*

2.2.3 The NPPF also includes the following considerations which are relevant to the Proposed Development:

> *"109. […] Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. […]"*
>
> *"180. 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. […]"*
>
> *"191. 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."*
>
> *"192. 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. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as*

possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

"*194. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.*"

2.2.4 The National Planning Practice Guidance (NPPG) states that whether or not air quality is relevant to a planning decision will depend on the proposed development air quality impacts in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife).

2.3 Local Planning Policy

Copeland Local Plan 2013-2028 (2013)

2.3.1 The current '*Copeland Local Plan 2013-2028'*, adopted in December 2013, is a planning framework designed to guide decisions and shape development in the borough. A review of the plan has identified the following policies relevant to air quality:

"*Policy ST1 - Strategic Development Principles*

The Strategic Development Principles that inform and underpin the Borough's planning policies are: […]

C Protect, enhance and restore the Borough's valued assets […]

vi) Ensure development minimises air, ground and water pollution"

D Ensure the creation and retention of quality places […]

ii) Ensure development provides or safeguards good levels of residential amenity and security"

2.3.2 Furthermore, Policy DM10 'Achieving Quality of Place' is relevant to this assessment:

> "The Council will expect a high standard of design and the fostering of 'quality places'. Development proposals will be required to: […]
>
> E Create and maintain reasonable standards of general amenity"

Copeland Local Plan 2021-2038 Publication Draft (2022)

2.3.3 Copeland Borough Council (CBC) are in the process of producing a new Local Plan which will replace the Core Strategy and saved policies, with a public consultation held in 2022. A review of the Publication Draft has identified that one sustainability objective relates to air quality, 'ENV8', which aims to improve air quality in Copeland. A review of the document has identified the following policy relevant to air quality, which will help achieve ENV8.

> *"Policy DS11PU: Protecting Air Quality*
>
> *Development proposals will only be granted planning permission where they will not give rise to unacceptable levels of air pollution. The Council will continue to monitor air quality in the borough and will introduce Air Quality Management Areas as necessary. […]"*

2.3.4 The above policies related to air quality have been considered within this report.

2.4 Guidance

Local Air Quality Management

2.4.1 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM).

2.4.2 This review and assessment of air quality involves comparing present and likely future pollutant concentrations against the AQOs. If it is predicted that levels at locations of relevant exposure, as summarised in Table 1, are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan, the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.4.3 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by LAs in their review and assessment work. This guidance, referred to in this document as LAQM.TG22, has been used where appropriate in the assessment.

3 ASSESSMENT METHODOLOGY

3.1 Construction Phase

3.1.1 The IAQM '*Guidance on the assessment of dust from demolition and construction*' provides a methodology to determine the potential air quality impacts associated with demolition and construction activity. The emphasis of the guidance document is to classify the risk of dust impacts from a site from which then to identify appropriate mitigation measures commensurate with the risk.

3.1.2 The underlying concept of Source-Pathway-Receptor is the basis of the guidance, with four main types of construction activity required to be considered as follows:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

3.1.3 The potential for dust emissions is assessed for each of these activities, taking into consideration three separate dust impacts:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

Assessment Procedure

The assessment steps provided within the IAQM guidance are summarised below.

Step 1

3.1.4 This step screens the requirement for a more detailed assessment. If there are no receptors within a certain distance then no further assessment is required.

3.1.5 For human receptors, these distances are specified as 350m from the site boundary or 50m from the construction vehicle route within 500m of the site entrance. Should any ecological receptors also be present within 50m of the construction vehicle route within 500m of the site entrance, these will require consideration. The assessment proceeds to Step 2 if any receptors are identified within these specified distances.

Step 2

3.1.6 This step assesses the risk of the dust impact for each of the four types of activity provided at paragraph 3.1.2, taking account of the scale and nature of the works to determine the dust magnitude (Step 2A) and the sensitivity of the area (Step 2B). Step 2C is then undertaken, considering these factors to provide the risk of dust impacts.

3.1.7 The criteria used during Step 2 of the assessment, as contained within the IAQM guidance, is summarised and provided at Appendix 1 of this report.

Step 3

3.1.8 Step 3 defines the site-specific mitigation measures to be adopted, based on the dust risk categories for each of the four activities undertaken at Step 2C.

3.1.9 Where the risk during Step 2C is defined as negligible, no mitigation measures beyond those required by legislation are required. However, control measures may be adopted as part of best practice.

Step 4

3.1.10 This step determines the significance of the effect after considering the construction activity with mitigation.

3.1.11 As recognised within the IAQM guidance, for almost all construction activity, the aim should be to prevent significant effects through the use of effective mitigation. Hence the residual effect will normally be 'not significant'.

3.2 Operational Phase

3.2.1 In accordance with the EPUK and IAQM document *'Land-Use Planning and Development Control: Planning for Air Quality'* (2017), a significant change would be described as a change in Light Duty Vehicle (LDV) flows of 500 Annual Average Daily Traffic (AADT) and/or Heavy-Duty Vehicle (HDV) flows of 100 AADT or more. Alternatively, a change in LDV flows of 100 AADT and/or HDV flows of 25 AADT or more on routes through an AQMA would also be considered a significant change in accordance with the guidance. Where these thresholds are exceeded, a detailed assessment of air quality is normally required.

3.2.2 Traffic generated by the Proposed Development is therefore, assessed against the above criteria in order to identify potential significant effects associated with the operational phase of the Site.

3.2.3 The number of vehicular trips generated by the scheme will exceed the IAQM criteria detailed above and therefore, has the potential to affect existing sensitive receptors when considering the additional future vehicle movements on the local road network.

3.2.4 An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at existing sensitive locations in the vicinity of the Site.

3.2.5 ADMS-Roads dispersion modelling software (version 5.0.1.3) has therefore been used to predict the concentrations of NO_2, PM_{10} and $PM_{2.5}$ at ESRs, as road traffic is a major source of these pollutants and their concentrations are considered to be the most likely to exceed the AQOs in urban locations.

3.2.6 The model utilises detailed traffic flow data and considers surface roughness and local meteorological conditions to predict pollutant concentrations. Details of the model input parameters are presented in Appendix 2.

Impact of Travel Restrictions on Air Quality

3.2.7 The UK Travel Restrictions significantly altered human behavioural patterns and led to noticeable variations in vehicular activity. Careful consideration should therefore be given to the reliability of local diffusion tube and automatic monitoring data used for model verification purposes, otherwise it is likely that pollutant concentrations may be underestimated.

3.2.8 The current LAQM tools used in road traffic emissions modelling, such as vehicle fleet turnover related forecasts and background pollutant concentrations, also do not currently take these noticeable variations in vehicular activity into account. Following a review of the latest available Air Quality Annual Status Report (ASR) by CBC, concentrations were noticeably lower in 2020, most likely attributed to the reduced traffic on the region's roads and the associated altered working patterns. Therefore, to avoid any uncertainty and underestimation of pollutant concentrations, the use of 2019 as a verification year has been used in this assessment.

Meteorological Data

3.2.9 The ADMS model utilises wind speed and directional data to determine pollutant concentrations at identified sensitive receptor locations. In line with the above, meteorological data for 2019 were obtained from the St Bees Head No. 2 observing station, located approximately 5.8km to the north-west of the Site. This station is considered to provide representative data for the assessment. A wind rose generated from the meteorological data is provided in Appendix 3.

Traffic Data

Traffic Flows

3.2.10 Traffic data for this assessment have been provided by the Project Transport Consultant (the 'PTC'), Andrew Moseley Associates. A summary of traffic data used in the assessment is presented in Appendix 2. This includes details of the Annual Average Daily Traffic (AADT) flows, vehicle speeds (km/h) and the percentage of heavy-duty vehicles (HDVs) for the local road network for each assessment year considered. Traffic speeds were reduced at junctions in line with the relevant LAQM Technical Guidance document (LAQM.TG22), and using professional judgement.

3.2.11 Traffic data for use in the assessment, including 24-hour AADT flows and fleet composition as HDV proportion, were obtained from the PTC and the Department for Transport (Dft) Road Traffic Statistics website, where applicable. The DfT web tool enables the user to view and download available traffic flows on every link of the 'A' road and motorway network, as well as selected minor roads, in Great Britain for the years 2000 to 2022. It should be noted that the DfT web tool is referenced in Defra's LAQM.TG22 guidance as being a suitable source of data for Air Quality Assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the Site.

3.2.12 Three scenarios were modelled, as follows:

- 2019 Model Verification;
- 2025 Anticipated Opening Year Without Development; and
- 2025 Anticipated Opening Year With Development.

3.2.13 The 2025 scenarios included baseline traffic data, inclusive of anticipated growth and allocated development, in addition to the predicted vehicle trips associated with the operation of the Proposed Development. Data were provided by the PTC or calculated using the UK Government's Trip End Model Presentation Program (TEMPro) version 8.0, where applicable.

3.2.14 Reference should be made to Figure 1 for a map of the modelled road link locations.

Vehicle Emission Factors

3.2.15 The Emissions Factors Toolkit (EFT) (version 12.0.1) was used to calculate emission factors for each road link in the model, utilising traffic flow and average speed data.

3.2.16 Due to uncertainty over UK NO_2 concentrations, with the implementation of new vehicle emission standards not resulting in the expected reduction in roadside pollutant levels, emission factors for the verification year of 2019 were utilised in preference to the Site development opening year in order to provide robust concentrations. A summary of the emission factors used in the assessment is presented in Appendix 2.

Background Concentrations

3.2.17 Background pollutant data have been taken from the national maps provided by Defra, with concentrations mapped at a grid resolution of 1kmx1km across the UK. These maps assume that background concentrations will improve over time, in line with the predicted reduction in vehicle emissions.

3.2.18 Due to the uncertainty described above, and in line with the findings of many local authorities that measured concentrations have not reduced as anticipated, background concentrations for the verification year of 2019 have been utilised for oxides of nitrogen (NO_x), NO_2, PM_{10} and $PM_{2.5}$ in this assessment, for the anticipated 2025 opening year of the Proposed Development. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operational phase.

Model Verification

3.2.19 Model verification was undertaken in accordance with the methodology outlined in LAQM.TG22. Model verification is undertaken to check the performance of the dispersion model, comparing the predicted concentrations with the measured roadside concentrations, at suitable monitoring locations. This aims to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor, to gain greater confidence in the results.

3.2.20 Model verification for this assessment has been performed for the year 2019, using one of CBC's diffusion tubes, with suitable monitoring data. Diffusion tube N5 is listed as an urban background classification in CBC's 2021 ASR, however, as the diffusion tube is located within 2m of a kerb, in accordance with the LAQM.TG22 guidance document this would be classified as a roadside location being located within 15m, and therefore, considered appropriate for use in model verification. A factor of **1.86** was obtained, indicating that the model was under-predicting. This factor was applied to the modelled road-NO_x outputs prior to conversion to annual mean NO_2 concentrations utilising the NO_x to NO_2 Calculator (version 8.1, 26th June 2020), provided by Defra.

3.2.21 Details of the verification factor calculations are provided in Appendix 2.

3.2.22 As local roadside monitoring data within the assessment extents were not available for PM_{10} or $PM_{2.5}$, the modelled road-PM_{10} and road-$PM_{2.5}$ concentrations have been adjusted by the verification factor obtained for NO_x. The NO_2, PM_{10} and $PM_{2.5}$ concentrations have then been combined with the respective background concentrations, to enable comparison with the relevant AQOs.

Sensitive Receptors

3.2.23 To complete the assessment of operational phase impacts, a number of receptors representative of locations of relevant public exposure were identified. Box 1-1 of LAQM.TG22 provides examples of the locations where the AQOs should/should not apply.

Receptors have been located adjacent to the roads most likely to experience the greatest change in traffic flows or composition, and therefore, NO_2 and particulate matter concentrations, as a result of the Proposed Development. The ESRs considered within this assessment are shown on

3.2.24 Figure 1 and detailed in Table 2.

Table 2 - Receptor Locations				
Receptor	**Description/Address**	**Grid Reference**		**Height above Ground Level (m)**
		X (m)	**Y (m)**	
ESR1	3 East Road	301150.0	511162.8	1.5
ESR2	26 East Road	301146.4	511199.6	1.5
ESR3	4 Spedding Close	301186.5	511336.5	1.5
ESR4	58 East Road	301206.2	511412.6	1.5
ESR5	Moreen Property, Wyndham Place	301231.8	510944.4	1.5
ESR6	Thorn Pike Farm	301529.0	510409.6	1.5
ESR7	94 Main Street	301064.6	511037.6	1.5
ESR8	1 Salford Terrace	301095.2	510996.9	1.5
ESR9	71 North Road	301075.5	511091.8	1.5
ESR10	Block 14 to 24, Christy Place	301050.2	511252.8	1.5
ESR11	37 North Road	300961.1	511327.1	1.5
ESR12	11 Howbank Road	300809.4	511398.3	1.5
ESR13	21 Howbank Road	300849.1	511375.3	1.5
ESR14	Orebank House	300514.5	512589.2	1.5
ESR15	The Cottage	301096.5	512824.8	1.5

Significance Criteria

3.2.25 The predicted impacts have been assessed against the AQOs detailed in Table 1. Changes in pollutant concentrations between the 'Without Development' and 'With Development' scenarios are also assessed against the IAQM significance criteria, detailed below.

3.2.26 The significance of predicted air quality impacts, resulting from the additional emissions associated with traffic generated by the Proposed Development, was determined in accordance with the IAQM guidance.

3.2.27 Using this methodology, impacts are defined based on the relationship between the predicted pollutant concentration for the 'Without Development' and 'With Development' assessment scenarios and the magnitude of change as a proportion of the respective AQO. This is summarised in Table 3 below.

Table 3 - Significance of Impact				
Concentration at Receptor in Assessment Year	**Predicted Concentration Change as proportion of AQO (%)**			
	1	**2-5**	**6-10**	**>10**
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

4 BASELINE

4.1 Introduction

4.1.1 A desk-top baseline review of existing air quality conditions in the vicinity of the Site has been undertaken. This is detailed in the following sections.

4.2 Local Emission Sources

4.2.1 The Site is located in an area where air quality is mainly influenced by road traffic emissions along the A595 Egremont Bypass and the local road network. There are no commercial sources identified within the vicinity of the Site that would influence local air quality.

4.3 Local Air Quality Management

4.3.1 The Site is located within CBC. According to the latest available Air Quality ASR, dated June 2021, CBC does not have any declared AQMAs within its area of jurisdiction.

4.4 Air Quality Monitoring

4.4.1 CBC currently monitor at 24 non-automatic (passive) diffusion tube sites. The closest monitoring location, diffusion tube 'N7', is located approximately 150m south-west of the Site at the Tourist Information, Egremont. The most recent diffusion tube monitoring results recorded in the vicinity of the Site are shown in Table 4. CBC do not currently undertake any automatic (continuous) monitoring.

Table 4 - Diffusion Tube Monitoring Results

Monitoring Site			Monitored NO_2 Concentration (µg/m³)				
ID	**Location**	**Type**	**2016**	**2017**	**2018**	**2019**	**2020**
N5	Aldby Lane, Cleator Moor	Urban Background	10.8	10.8	10.8	10.0	7.4
N7	Tourist Information, Egremont	Urban Centre	16.7	15.1	18.3	17.0	12.4
N8	St Bridget's Presbytry, Egremont	Urban Background	6.8	6.2	7.4	6.2	5.1

4.4.2 As shown in Table 4, annual mean NO_2 concentrations did not exceed the relevant AQO at any diffusion tube monitoring location, during the five most recent monitoring years. No monitoring of PM_{10} or $PM_{2.5}$ is currently undertaken in the vicinity of the Site.

4.4.3 CBC also undertake diffusion tube monitoring for sulphur dioxide (SO_2), with the closest monitoring location to the Site, 'S6' at the Tourist Information, Egremont. As the Proposed Development will not influence concentrations of SO_2, this pollutant is not considered further within this report.

4.5 Background Concentrations

4.5.1 In addition to the review of NO_2, PM_{10} or $PM_{2.5}$ monitoring undertaken in the vicinity of the Site, background concentrations have been obtained from the 2018 based default concentration maps provided by Defra for the relevant grid square for the Site and assessment extents. These data are provided below in Table 5.

Table 5 - Predicted Background Pollutant Concentrations (µg/m³) (2019)

OS Grid Square (X, Y; m)	NO_2	NO_x	PM_{10}	$PM_{2.5}$
300500, 511500	4.8	6.0	8.8	5.5
300500, 512500	4.9	6.2	8.8	5.4
301500, 510500	5.1	6.4	8.9	5.5
301500, 511500	4.6	5.7	8.5	5.4
301500, 512500	4.4	5.5	8.7	5.3

4.5.2 As shown in Table 5, predicted background concentrations were well below the national AQOs of 40µg/m³ for NO_2 and PM_{10} and 20µg/m³ for $PM_{2.5}$. For $PM_{2.5}$, predicted background concentrations were also below the target exposure level of 10µg/m³, implemented at the end of January 2023 under the Environment Act 2021.

4.6 Construction Phase

4.6.1 Human receptors within 350m of the site boundary or within 50m of the construction vehicle route, up to 500m from the site entrance, need to be considered during the construction phase assessment. A review of the Site location has indicated that with the closest sensitive to the north and south, there are 1-10 receptors located <20m from the Site boundary, at worst. When considering the sensitivity of the area to dust soiling effects based on the criteria contained within Table A1.4 of Appendix 1, due to the number and distance to existing **high sensitivity** receptors, the sensitivity of the area is deemed to be **medium**, at worst.

4.6.2 When considering the sensitivity of the area to human health effects based on the criteria contained within Table A1.5 of Appendix 1, due to the number and distance to existing **high sensitivity** receptors, and considering the annual mean background PM_{10} concentrations at the Site presented in Table 5, the sensitivity is deemed to be **low**.

4.6.3 There are no ecological receptors located within 50m of the Site boundary or within 50m of the assumed route that construction vehicles would take upon departure.

4.7 Meteorological Data

4.7.1 The potential for dust and particulate matter to impact sensitive locations depends significantly on meteorology, particularly wind direction and wind speed, during emissions. To consider the prevailing conditions at the Site, a review of historical weather data has been undertaken. The closest observation station with a suitable dataset is St Bees Head No. 2, located approximately 5.8km to the north-west of the Site. It is anticipated that meteorological conditions would be reasonably similar over a distance of this magnitude. Meteorological data were obtained for the period 1st January 2019 to 31st December 2019 (inclusive), and reference should be made to Appendix 3 for a wind rose of these data. A review of the wind rose has shown that any receptors located to the north of the Site have the greatest potential to be affected by dust and particulate matter emitted and re-suspended during the construction phase, as a result of the prevailing wind direction. However, under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source.

5 IMPACT ASSESSMENT

5.1 Construction Phase

Step 1

5.1.1 A baseline review of the Site and surrounding area has identified human receptors within 350m of the Site boundary, and therefore, a detailed assessment has been undertaken.

5.1.2 There are no ecological receptors within the relevant screening distances of the Site or the local road network and as such, these effects are not considered further within the assessment. It is therefore concluded that, the level of risk for ecological receptors is **negligible**.

Step 2

5.1.3 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four dust and PM_{10} sources: demolition, earthworks, construction and trackout. The findings are presented below, with detailed descriptors for each magnitude presented in Table A1.1 of Appendix 1.

Demolition

5.1.4 The key factors when determining the potential dust emission magnitude for the demolition element include the volume and height of the buildings being demolished and the type of materials present.

5.1.5 It is assumed that the volume of buildings to be demolished on-site is <20,000m^3, and as such, the potential dust emission magnitude associated with demolition is considered to be **small.**

5.1.6 As the sensitivity of the area to dust soiling effects is **medium** at worst, in accordance with Table A1.7 of Appendix 1, the risk of dust impact during earthworks, with a **small** dust emission magnitude, is **low risk**.

Earthworks

5.1.7 Earthworks involve excavating material, haulage, tipping and stockpiling. There may also be levelling of the Site and landscaping.

5.1.8 The exact number of heavy earth-moving vehicles active on the Site at any one time is unknown, however, as the total Site area is between 2,500m^2 and 10,000m^2, the potential dust emission magnitude associated with earthworks is considered to be **medium.**

5.1.9 As the sensitivity of the area to dust soiling effects is **medium** at worst, in accordance with Table A1.7 of Appendix 1, the risk of dust impact during earthworks, with a **medium** dust emission magnitude, is **medium risk**.

Construction

5.1.10 The key factors when determining the potential dust emission magnitude for the construction element include the size of the buildings, method of construction and the construction materials used.

5.1.11 The total volume of buildings to be constructed on the Site is assumed to be between 25,000m^3 and 100,000m^3. Therefore, the potential dust emission magnitude associated with construction is considered to be **medium**.

5.1.12 As the sensitivity of the area to dust soiling effects is **medium** at worst, in accordance with Table A1.7 of Appendix 1, the risk of dust impact during construction, with a **medium** dust emission magnitude, is **medium risk**.

Trackout

5.1.13 Trackout is the term given to the transport of dust and dirt from the Site on vehicle tyres, deposited on the local road network that may later become suspended in the air as a result of vehicle movements.

5.1.14 At this stage, there is no information available regarding the number of HDVs or the proposed construction routes, and therefore, professional judgement has been used. As the Site is currently developed, the unpaved road length within the Site boundary is less than 50m in length and as such, it is considered that the potential dust emission magnitude associated with trackout is **small**.

5.1.15 As the sensitivity of the area to dust soiling effects is **medium** at worst, in accordance with Table A1.7 of Appendix 1, the risk of dust impact associated with trackout, with a **small** dust emission magnitude, is **negligible risk**.

Summary

5.1.16 The predicted dust emission magnitude has been combined with the defined sensitivity of the area (presented in Section 4.6) to determine the risk of dust impacts during the construction phase of the Proposed Development. A summary of the dust risk for each phase is provided in Table 6.

Table 6 - Summary of Dust Risk Prior to Mitigation

Potential Impact	Risk			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Dust Soiling	Low Risk	Medium Risk	Medium Risk	Negligible Risk
Human Health	Negligible Risk	Low Risk	Low Risk	Negligible Risk
Ecological	N/A	N/A	N/A	N/A

Step 3

5.1.17 Appropriate, site-specific mitigation is to be adopted based on the dust risk categories determined above. Examples of mitigation to reduce dust impact which are summarised in Section 6, and can be included in the Construction Environmental Management Plan for the scheme.

Step 4

5.1.18 Providing the mitigation measures summarised in Section 6 are implemented, the residual effect is considered to be **not significant** in accordance with the IAQM guidance.

5.2 Operational Phase

5.2.1 The number of vehicular trips generated by the scheme will exceed the relevant IAQM criteria and as such, the Proposed Development was assessed to determine the potential for traffic movements on the local road network, and those associated with the proposed scheme, to affect ESRs.

Nitrogen Dioxide (NO_2)

Annual Mean

5.2.2 Annual mean NO_2 concentrations were predicted at the ESRs for an anticipated opening year of 2025 for the 'Without Development' and 'With Development' scenarios.

5.2.3 The results are summarised in Table 7 below.

Table 7 - Calculated Annual Mean Concentrations of NO_2 for 2025 (µg/m³)						
Receptor	**Without Dev.**	**With Dev.**	**% of AQAL**	**Change**	**% of AQO**	**Impact**
ESR1	7.9	8.7	21.8	0.8	2.0	Negligible
ESR2	7.1	7.5	18.8	0.4	1.0	Negligible
ESR3	6.1	6.2	15.5	0.1	<0.5	Negligible
ESR4	6.0	6.1	15.3	0.1	<0.5	Negligible
ESR5	8.0	8.1	20.3	0.1	<0.5	Negligible
ESR6	7.2	7.2	18.0	<0.1	<0.5	Negligible
ESR7	8.9	9.2	23.0	0.3	0.7	Negligible
ESR8	10.1	10.3	25.8	0.2	0.5	Negligible
ESR9	14.4	14.9	37.3	0.5	1.3	Negligible
ESR10	9.0	9.1	22.8	0.1	<0.5	Negligible
ESR11	8.6	8.7	21.8	0.1	<0.5	Negligible
ESR12	7.5	7.6	19.0	0.1	<0.5	Negligible
ESR13	7.5	7.6	19.0	0.1	<0.5	Negligible
ESR14	7.6	7.6	19.0	<0.1	<0.5	Negligible
ESR15	6.0	6.1	15.3	0.1	<0.5	Negligible

5.2.4 As indicated in Table 7, predicted annual mean NO_2 concentrations were below the relevant AQO at all sensitive receptors in the modelled 2025 'Without Development' and 'With Development' scenarios, with no risk of exceedance of the relevant AQO.

5.2.5 The highest predicted increase was 0.8µg/m³ at receptor ESR1 '3 East Road', resulting in a **negligible** impact on annual mean NO_2 concentrations, from the additional traffic associated with the operation of the Proposed Development.

5.2.6 Based on the extent of predicted population exposure to the impacts on annual mean NO_2 concentrations and the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean NO_2 concentrations is considered to be **negligible**, with the resulting effect **not significant**.

1-Hour Mean

5.2.7 As provided within LAQM.TG22, a study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60µg/m³. Analysis of data in more recent years has shown local authorities should continue to use this assumption, where NO_2 1-hour mean monitoring data are not available.

5.2.8 The risk of non-compliance with the 1-hour mean objective, where up to 18 exceedances of a 1-hour mean concentration of 200µg/m^3 are allowed in a calendar year, is therefore considered likely when the annual mean concentration is greater than 60µg/m^3 but unlikely when not. This approach has been adopted for this assessment.

5.2.9 The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3, and therefore, hourly mean NO_2 concentrations are unlikely to cause a breach of the hourly mean AQS objective. The impact of the Proposed Development on hourly mean NO_2 concentrations at sensitive receptors is considered to be **negligible**, with the resulting effect considered to be **not significant**.

Particulate Matter (PM_{10})

Annual Mean

5.2.10 Annual mean PM_{10} concentrations were predicted at the sensitive receptors for an anticipated opening year of 2025 for the 'Without Development' and 'With Development' scenarios. These are summarised in Table 8.

Table 8 - Calculated Annual Mean Concentrations of PM_{10} for 2025 (µg/m^3)

Receptor	Without Dev.	With Dev.	% of AQAL	Change	% of AQO	Impact
ESR1	9.0	9.1	22.8	0.1	<0.5	Negligible
ESR2	8.9	9.0	22.4	0.1	<0.5	Negligible
ESR3	8.8	8.8	22.0	<0.1	<0.5	Negligible
ESR4	8.8	8.8	22.0	<0.1	<0.5	Negligible
ESR5	9.3	9.3	23.3	<0.1	<0.5	Negligible
ESR6	9.2	9.2	22.9	<0.1	<0.5	Negligible
ESR7	9.1	9.1	22.8	<0.1	<0.5	Negligible
ESR8	9.7	9.7	24.3	<0.1	<0.5	Negligible
ESR9	9.6	9.7	24.3	0.1	<0.5	Negligible
ESR10	9.3	9.4	23.4	<0.1	<0.5	Negligible
ESR11	9.5	9.5	23.8	<0.1	<0.5	Negligible
ESR12	9.3	9.3	23.2	<0.1	<0.5	Negligible
ESR13	9.3	9.3	23.3	<0.1	<0.5	Negligible
ESR14	9.2	9.2	23.0	<0.1	<0.5	Negligible
ESR15	8.9	8.9	22.3	<0.1	<0.5	Negligible

5.2.11 As indicated in Table 8, predicted annual mean PM_{10} concentrations were below the relevant AQO at all sensitive receptors in the modelled 2025 'Without Development' and 'With Development' scenarios, with no risk of exceedance of the relevant AQO.

5.2.12 The highest predicted increase was 0.1µg/m^3 at receptors ESR1 '3 East Road', ESR2 '26 East Road' and ESR9 '71 North Road'. This resulted in a **negligible** impact on annual mean PM_{10} concentrations, from the additional traffic associated with the operation of the Proposed Development.

5.2.13 Based on the extent of predicted population exposure to the impacts on annual mean PM_{10} concentrations and the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean PM_{10} concentrations is considered to be **negligible**, with the resulting effect **not significant**.

24-Hour Mean

5.2.14 To estimate potential exceedances of the PM_{10} 24-hour mean AQO, the following relationship can be used:

- No. 24-hour mean exceedances = -18.5 + 0.00145 x annual mean^3 + (206/annual mean)

5.2.15 Applying the above calculation to the predicted annual mean PM_{10} concentrations result in no predicted exceedances of the 24-hour mean AQO.

5.2.16 As such, the impacts of increased emissions associated with the operational phase of the Proposed Development are **negligible**.

Particulate Matter ($PM_{2.5}$)

Annual Mean

5.2.17 Annual mean $PM_{2.5}$ concentrations were predicted at the sensitive receptors for an opening year of 2025 for 'Without Development' and 'With Development' scenarios. These are summarised in Table 9.

Table 9 - Calculated Annual Mean Concentrations of $PM_{2.5}$ for 2025 (µg/m^3)

Receptor	Without Dev.	With Dev.	% of AQAL	Change	% of AQO	Impact
ESR1	5.7	5.7	28.5	<0.1	<0.5	Negligible
ESR2	5.6	5.7	28.5	0.1	0.5	Negligible
ESR3	5.6	5.6	28.0	<0.1	<0.5	Negligible
ESR4	5.6	5.6	28.0	<0.1	<0.5	Negligible
ESR5	5.8	5.8	29.0	<0.1	<0.5	Negligible
ESR6	5.7	5.7	28.5	<0.1	<0.5	Negligible
ESR7	5.7	5.7	28.5	<0.1	<0.5	Negligible
ESR8	6.0	6.0	30.0	<0.1	<0.5	Negligible
ESR9	6.0	6.1	30.5	0.1	0.5	Negligible
ESR10	5.9	5.9	29.5	<0.1	<0.5	Negligible
ESR11	5.9	5.9	29.5	<0.1	<0.5	Negligible
ESR12	5.7	5.7	28.5	<0.1	<0.5	Negligible

Table 9 - Calculated Annual Mean Concentrations of $PM_{2.5}$ for 2025 (µg/m³)						
Receptor	**Without Dev.**	**With Dev.**	**% of AQAL**	**Change**	**% of AQO**	**Impact**
ESR13	5.7	5.7	28.5	<0.1	<0.5	Negligible
ESR14	5.7	5.7	28.5	<0.1	<0.5	Negligible
ESR15	5.5	5.5	27.5	<0.1	<0.5	Negligible

5.2.18 As indicated in Table 9, predicted annual mean $PM_{2.5}$ concentrations were below the relevant AQO and national target value of 10µg/m³ at all sensitive receptors in the modelled 2025 'Without Development' and 'With Development' scenarios, with no risk of exceedance of the relevant AQO or target value.

5.2.19 The highest predicted increase was 0.1µg/m³ at receptors ESR2 '26 East Road' and ESR9 '71 North Road'. This resulted in a **negligible** impact on annual mean $PM_{2.5}$ concentrations, from the additional traffic associated with the operation of the Proposed Development.

5.2.20 Based on the extent of predicted population exposure to the impacts on annual mean $PM_{2.5}$ concentrations and the EPUK/IAQM guidance, the impact of the increased emissions associated with the Proposed Development on annual mean $PM_{2.5}$ concentrations is considered to be **negligible**, with the resulting effect **not significant**.

5.3 Summary

5.3.1 Predicted concentrations of all pollutants considered during both assessment scenarios for the operational phase, were below the relevant AQOs and target value for $PM_{2.5}$, without the risk of exceedance at sensitive receptor locations.

5.3.2 The IAQM guidance states that only if the impact is greater than slight, the effect is considered significant.

5.3.3 Impacts were predicted to be **negligible** for NO_2, PM_{10} and $PM_{2.5}$ at all sensitive receptors considered, with consideration of the increase in the AADT associated with development traffic on the local road network.

5.3.4 As impacts were predicted to be **negligible**, the overall effect is considered to be **not significant**, in accordance with the guidance, and therefore, the implementation of mitigation measures during the operational phase is not required.

6 MITIGATION AND RESIDUAL EFFECTS

6.1 Construction Phase

6.1.1 Based on the assessment results, mitigation will be required during the construction phase of the Proposed Development. The measures to be followed during the construction of the Proposed Development are detailed below.

Dust Suppression

6.1.2 During work activities where dust is likely to be generated by cutting operations water suppression equipment will be provided to minimise the migration of hazardous airborne particles. Such water suppression equipment will be serviced from the on-site temporary water supply. Operatives using cutting equipment will be 'Face Fit' trained, clean shaven and will wear the appropriate face mask.

Management of Dust

6.1.3 As a number of properties are within close proximity to the construction operations it is essential that good practice procedures are implemented on site in order to mitigate air pollution (e.g. through dust and fume generation) impacts. Measures currently planned to be adopted include:

- Off-site pre-fabrication is to be implemented where practical.
- All plant and equipment to be used for the works to be properly maintained, silenced where appropriate, and operated to prevent excessive noise and switched off when not in use and where practicable;
- Plant will be certified to meet relevant current legislation and British Standard standards.
- All Trade Contractors are to be familiar with current legislation and codes of practice.
- Loading and unloading of vehicles, dismantling of site equipment such as scaffolding or moving equipment or materials around site will, where possible, be carried out away from sensitive areas.
- Any noise or dust related complaints will be investigated and actioned accordingly.
- Road brushing and water suppression will be implemented when deemed necessary.
- Plant and equipment will be switched off when not in use.
- Vehicles transporting materials to and from site are to be suitably sheeted in order to prevent the release of materials and particulate matter.

- A wheel / body washing facility will be provided at the site entrance / exit in the form of a self-contained wheel wash facility.

Residual Effects

6.1.4 Following the application of the mitigation measures described above, and good site practice, the residual effects of dust and PM_{10} generated by construction activities are considered to be **not significant**.

6.1.5 The residual effects of emissions to air from construction vehicles and plant on local air quality are considered to be **not significant**.

6.2 Operational Phase

6.2.1 The changes in pollutant concentrations attributable to traffic emissions associated with the Proposed Development are **negligible** and therefore, in accordance with the assessment criteria, mitigation is not required.

Residual Effects

6.2.2 The Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors. As such, no significant effects on air quality are anticipated at existing receptors.

6.2.3 The residual effects of the Proposed Development on air quality are considered to be **not significant** for NO_2, PM_{10} and $PM_{2.5}$, according to the EPUK/IAQM assessment criteria.

6.2.4 Predicted concentrations of all pollutants considered, are below the relevant AQOs and target value without the risk of exceedance at ESRs.

7 CONCLUSION

7.1.1 NJD Environmental Associates Ltd was instructed by Aldi Stores Ltd to prepare an Air Quality Assessment, to inform a planning application for a proposed food store located on land south of Wyndham Place in Egremont.

7.1.2 A qualitative assessment of the potential impacts on local air quality from construction phase activities has been undertaken, in accordance with the relevant guidance document. This identified that there is a **medium** to **negligible risk** of dust soiling impacts and a **low** to **negligible risk** of increases in particulate matter concentrations, due to unmitigated construction activities. However, through good site practice and the implementation of the recommended mitigation measures, the effects of dust and PM_{10} releases would be significantly reduced. The residual effects of dust and PM_{10} generated by construction activities on air quality are therefore, considered to be **not significant**.

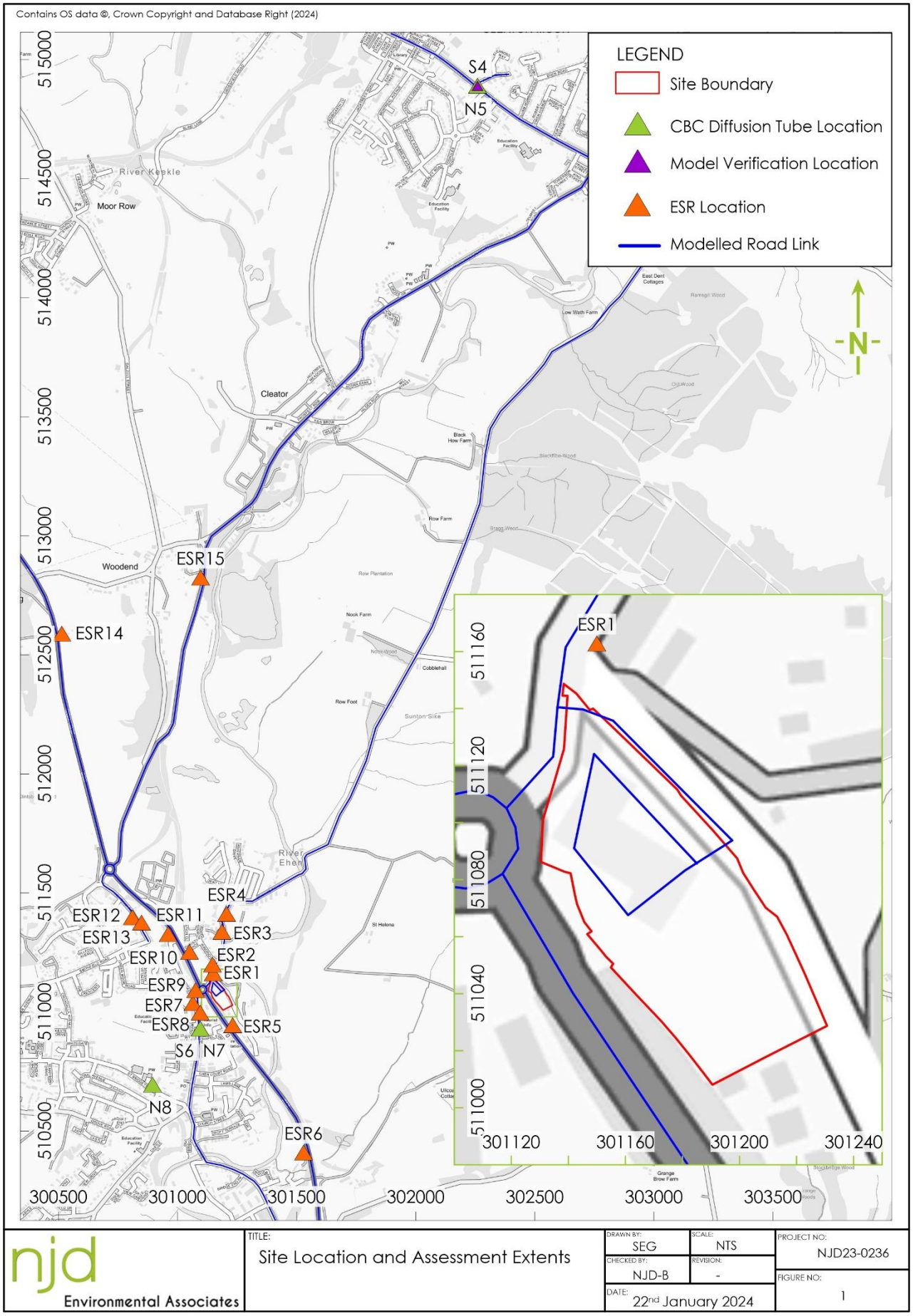
7.1.3 The number of vehicular trips generated by the scheme will exceed the IAQM criteria, and as such, a detailed dispersion modelling assessment was undertaken, in accordance with the relevant guidance, to determine the potential for traffic movements on the local road network, and those associated with the proposed scheme, to affect ESRs.

7.1.4 Predicted concentrations of all pollutants considered during both assessment scenarios for the operational phase, were below the relevant AQOs and target value for $PM_{2.5}$, without the risk of exceedance at sensitive receptor locations.

7.1.5 The Proposed Development is expected to result in **negligible** impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations at the worst case ESRs, in closest proximity to the roads affected by the highest development flows. The residual effects are predicted to be **not significant** in accordance with IAQM guidance and as such, the implementation of additional mitigation measures during the operational phase is not required.

7.1.6 Based on the results of this assessment, it is concluded that air quality should not be a prohibitive factor in the determination of this planning application.

FIGURES



njd Environmental Associates	TITLE: Site Location and Assessment Extents	DRAWN BY: SEG	SCALE: NTS	PROJECT NO: NJD23-0236
		CHECKED BY: NJD-B	REVISION: -	FIGURE NO: 1
		DATE: 22nd January 2024		

APPENDICES

Appendix 1 - IAQM Construction Phase Assessment Criteria

Table A1.1 - Potential Dust Emission Magnitude

Magnitude	Activity	IAQM Criteria
Large	Demolition	• >50,000m^3 building demolished • Dusty material (e.g., concrete) • On-site crushing/screening • Demolition >20m above ground level
	Earthworks	• Total site area >10,000m^2 • Potentially dusty soil type, e.g., clay • >10 heavy earth moving vehicles active at any one time • Formation of bunds >8m in height • Total material moved >100,000 tonnes
	Construction	• Total building volume >100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• >50 HDV (>3.5t) outward movements in any one day • Potentially dusty surface material, e.g., high clay content • Unpaved road length >100m
Medium	Demolition	• 20,000 - 50,000m^3 building demolished • Dusty material (e.g., concrete) • Demolition 10-20m above ground level
	Earthworks	• Total site area 2,500m^2 - 10,000m^2 • Moderately dusty soil type, e.g., silt • 5-10 heavy earth moving vehicles active at any one time • Formation of bunds 4m-8m in height • Total material moved 20,000 tonnes – 100,000 tonnes
	Construction	• Total building volume 25,000m^3 - 100,000m^3 • Potentially dusty construction material, e.g., concrete • On site concrete batching
	Trackout	• 10-50 HDV(>3.5t) outward movements in any one day • Moderately dusty surface material, e.g., high clay content • Unpaved road length 50m – 100m
Small	Demolition	• <20,000m^3 building demolished • Non-dusty material (e.g., metal cladding) • Demolition <10m above ground level • Work during wetter months
	Earthworks	• Total site area <2,500m^2 • Soil type with large grain size, e.g., sand • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4m in height • Total material moved <20,000t • Earthworks during wetter months

Magnitude	Activity	IAQM Criteria
Small	Construction	• Total building volume <25,000m^3 • Construction material with low potential for dust release, e.g., metal cladding or timber
	Trackout	• <10 HDV (>3.5t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50m

Table A1.2 - Factors to Consider - Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Human Receptors	Ecological Receptors
High	• Users can expect enjoyment of a high level of amenity • The appearance, aesthetics or value of their property would be diminished by soiling • People or property reasonably expected to be present continuously, or at least regularly for extended periods, as part of the normal use of the land • Indicative examples include dwellings, museums, medium and long-term car parks and car showrooms	• Locations with an international or national designation and the designated features may be affected by dust soiling • Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain • Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings
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 • The appearance, aesthetics or value of their property could be diminished by soiling • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal use of the land • Indicative examples include parks and places of work	• Location where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown • Locations with a national designation where the features may be affected by dust deposition • Indicative examples are a Site of Special Scientific Interest (SSSI) with dust sensitive features

Receptor Sensitivity	Human Receptors	Ecological Receptors
Low	• The enjoyment of amenity would not reasonably be expected • Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling • There is a 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 • Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads	• Locations with a local designation where the features may be affected by dust deposition • Indicative example is a local nature reserve with dust sensitive features

Table A1.3 - Factors to Consider - Sensitivity of People to Health Effects of PM_{10}

Receptor Sensitivity	Human Receptors
High	• Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for 8 hours or more in a day). • Indicative examples include residential properties. Hospitals and schools should also be considered as have equal sensitivity to residential areas for the purposes of this assessment.
Medium	• Locations where the people exposed are workers and exposure are over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for 8 hours or more in a day). • Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
Low	• Locations where human exposure is transient. • Indicative examples include public footpaths, playing fields, parks and shopping streets.

TABLE A1.4 - 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	<350
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 A1.5 - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m^3 (>18 µg/m^3 in Scotland)	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m^3 (16-18 µg/m^3 in Scotland	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m^3 (14-16 µg/m^3 in Scotland	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m^3 (<14 µg/m^3 in Scotland	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m^3 (>18 µg/m^3 in Scotland)	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m^3 (16-18µg/m^3 in Scotland)	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m^3 (14-16µg/m^3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m^3 (<14µg/m^3 in Scotland)	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Table A1.6 - Factors to Consider - Sensitivity of the Area to Ecological Impacts

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

Table A1.7 - Risk of Dust Impacts

Sensitivity of 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 and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Appendix 2 - Model Input Parameters

Traffic Data

Table A2.1 - 2019 Verification Traffic Data

Road Link	Description	AADT (Total Vehicles)	%HDV	Speed (km/h)	NO_X Emission Factor (g/km/s)
1	Cycle Route 72 (S), East Road, Junction Approach	246	0.00	5	0.001635
2	Cycle Route 72 (S)	246	0.00	30	0.001051
3	Site Access Road	-	-	-	-
4	East Road, North of Cycle Route 72	1,796	0.56	30	0.007923
5	East Road, Roundabout Approach	2,038	0.49	5	0.014737
6	East Road Roundabout	10,389	2.40	5	0.098772
7	A595 Egremont Bypass (S), East Road Roundabout, Junction Approach	10,466	2.21	5	0.097134
8	A595 Egremont Bypass (S)	10,466	2.21	80	0.039452
9	Main Street, East Road Roundabout, Junction Approach	7,299	2.37	5	0.069133
10	Main Street	7,299	2.37	30	0.035459
11	A595 Egremont Bypass (N), East Road Roundabout, Junction Approach	16,855	2.45	5	0.161251
12	A595 Egremont Bypass (N)	16,855	2.45	45	0.069849
13	A595 Egremont Bypass (N), A5086 / Howbank Road Roundabout Approach	16,855	2.45	5	0.161251
14	A595 Egremont Bypass (N) / A5086 / Howbank Road Roundabout	10,913	2.30	5	0.102453
15	Howbank Road, A595 Egremont Bypass / A5086 Roundabout Approach	4,131	0.00	5	0.027460
16	Howbank Road	4,131	0.00	30	0.017652
17	A595 Clints Brow (N), Howbank Road / A5086 Roundabout Approach	13,316	2.02	5	0.120570
18	A595 Clints Brow (N)	13,316	2.02	80	0.049898
19	A5086, A595 / Howbank Road Roundabout Approach	5,724	2.34	5	0.054011
20	A5086	5,724	2.34	80	0.021664
21	East Road, North of Cycle Route 72	1,796	0.56	80	0.006422
22	A5086 Trumpet Road	5,724	2.34	30	0.027765
23	B5295 Ennerdale Road, A5086 Trumpet Road, Junction Approach	8,913	2.56	5	0.086438
24	B5295 Ennerdale Road, East of Priory Drive	8,913	2.56	30	0.043718
25	B5295 Ennerdale Road, West of Priory Drive	8,913	2.56	20	0.051508
26	Aldby Grove	733	0.41	5	0.005231

Table A2.2 - 2025 Traffic Data - Without Development

Road Link	AADT (Total Vehicles)	%HDV	Speed (km/h)	NO_X Emission Factor (g/km/s)	PM_{10} Emission Factor (g/km/s)	$PM_{2.5}$ Emission Factor (g/km/s)
1	261	0.00	5	0.001735	0.000131	0.000074
2	261	0.00	30	0.001115	0.000127	0.000070
3	-	-	-	-	-	-
4	1,902	0.53	30	0.008376	0.000936	0.000516
5	2,158	0.46	5	0.015528	0.001100	0.000623
6	11,005	2.40	5	0.104628	0.005934	0.003405
7	11,086	2.20	5	0.102756	0.005944	0.003407
8	11,086	2.20	80	0.041776	0.003471	0.002121
9	7,732	2.37	5	0.073234	0.004165	0.002390
10	7,732	2.37	30	0.037563	0.003992	0.002216
11	17,854	2.45	5	0.170808	0.009640	0.005534
12	17,854	2.45	45	0.073988	0.008650	0.004784
13	17,854	2.45	5	0.170808	0.009640	0.005534
14	11,560	2.30	5	0.108527	0.006215	0.003565
15	4,376	0.00	5	0.029088	0.002199	0.001243
16	4,376	0.00	30	0.018699	0.002124	0.001167
17	14,105	2.02	5	0.127714	0.007523	0.004308
18	14,105	2.02	80	0.052855	0.004393	0.002684
19	6,063	2.34	5	0.057209	0.003264	0.001872
20	6,063	2.34	80	0.022947	0.001906	0.001165
21	1,902	0.53	80	0.006795	0.000567	0.000345
22	6,063	2.34	30	0.029410	0.003128	0.001736
23	9,202	2.56	5	0.089241	0.004984	0.002863
24	9,202	2.56	30	0.045135	0.004773	0.002652
25	9,202	2.56	20	0.053178	0.004860	0.002739
26	757	0.41	5	0.005402	0.000385	0.000218

Table A2.3 - 2025 Traffic Data - With Development

Road Link	AADT (Total Vehicles)	%HDV	Speed (km/h)	NO_X Emission Factor (g/km/s)	PM_{10} Emission Factor (g/km/s)	$PM_{2.5}$ Emission Factor (g/km/s)	Trip Generation (AADT)
1	2,440	0.16	5	0.016685	0.001232	0.000697	2,179
2	2,440	0.16	30	0.010523	0.001189	0.000654	2,179
3	2,179	0.18	5	0.014952	0.001101	0.000623	2,179
4	2,011	0.50	30	0.008841	0.000989	0.000545	109
5	4,229	0.33	5	0.029774	0.002147	0.001216	2,071
6	11,753	2.30	5	0.110339	0.006319	0.003624	748
7	11,304	2.16	5	0.104238	0.006054	0.003469	218
8	11,304	2.16	80	0.042545	0.003535	0.002160	218
9	8,167	2.24	5	0.076089	0.004384	0.002513	435
10	8,167	2.24	30	0.039414	0.004202	0.002332	435
11	18,180	2.43	5	0.173493	0.009811	0.005632	326
12	18,180	2.43	45	0.075274	0.008804	0.004869	326
13	18,180	2.43	5	0.173493	0.009811	0.005632	326
14	11,760	2.30	5	0.110405	0.006323	0.003627	200
15	4,485	0.00	5	0.029813	0.002254	0.001274	109
16	4,485	0.00	30	0.019165	0.002176	0.001196	109
17	14,214	2.03	5	0.128870	0.007584	0.004343	109
18	14,214	2.03	80	0.053280	0.004428	0.002705	109
19	6,172	2.30	5	0.057944	0.003318	0.001903	109
20	6,172	2.30	80	0.023331	0.001938	0.001185	109
21	2,011	0.50	80	0.007177	0.000599	0.000364	109
22	6,172	2.30	30	0.029877	0.003181	0.001766	109
23	9,202	2.56	5	0.089241	0.004984	0.002863	0
24	9,202	2.56	30	0.045135	0.004773	0.002652	0
25	9,202	2.56	20	0.053178	0.004860	0.002739	0
26	757	0.41	5	0.005402	0.000385	0.000218	0

Meteorology

Roughness Length z0:

Proposed Development Site: 0.5m

Meteorological site: 0.5m

This value of z0 is considered appropriate for the morphology of both of these areas and is suggested within ADMS-Roads as being suitable for 'parkland, open suburbia'.

Monin-Obukhov Length:

Proposed Development Site: 10m

Meteorological site: 10m

This value is considered appropriate for the nature of both of these areas and is suggested within ADMS Roads as being suitable for 'small towns <50,000'.

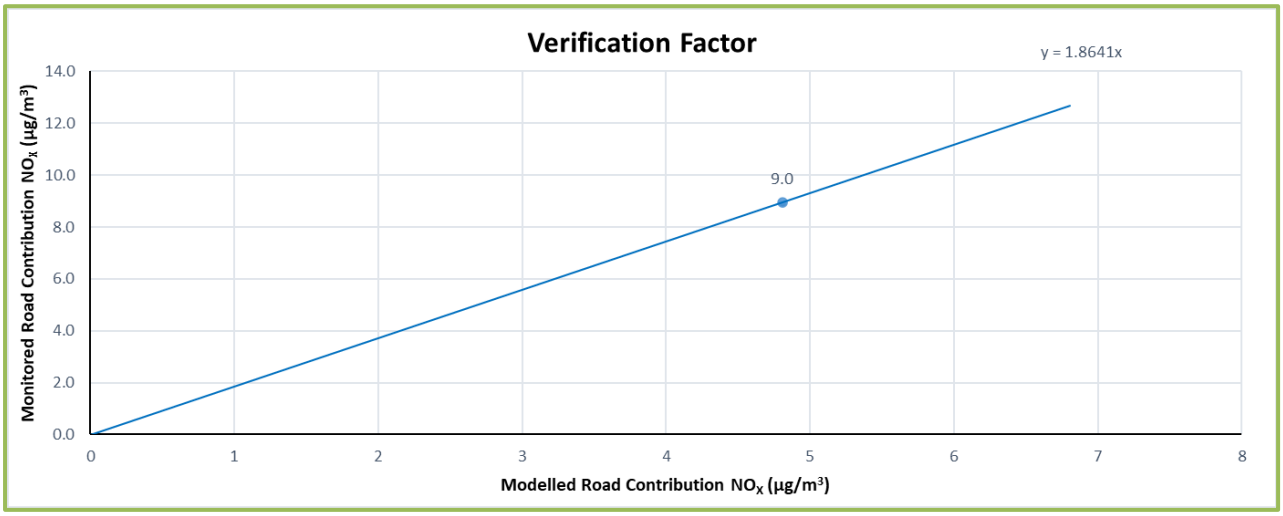
Model Verification

Nitrogen Dioxide (NO_2)

Table A2.4 - Model Verification

Site ID	2019 Monitored Total NO_2 (µg/m³)	2019 Background NO_2 (µg/m³)	2019 Monitored Road Contribution NO_X (µg/m³)	2019 Modelled Road Contribution NO_X (µg/m³)	Ratio
N5	10.0	5.0	9.0	4.8	1.8641

Figure A2.1 - Comparison of Measured Road-NO_x with Unadjusted Modelled Road-NO_x



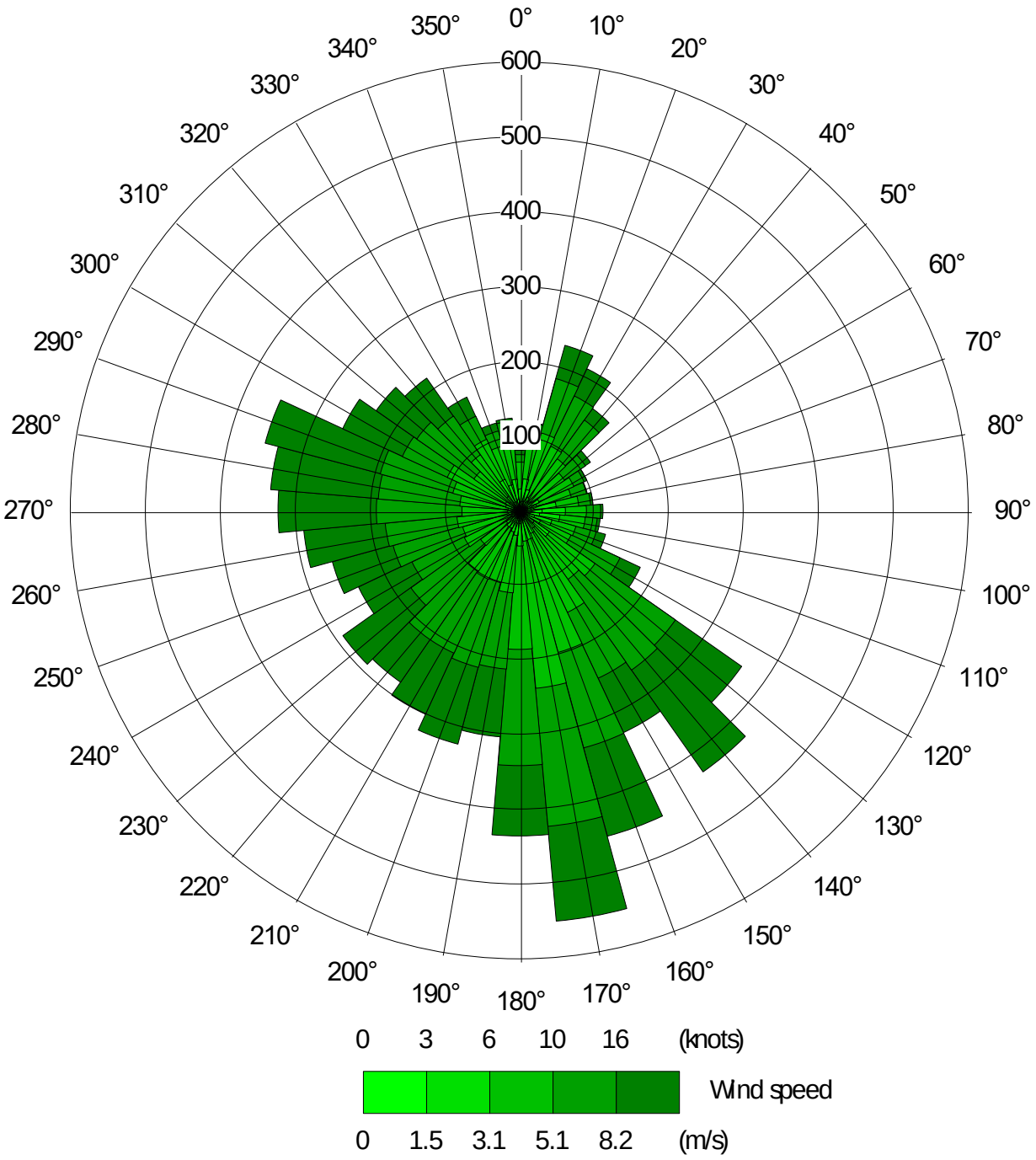
VERIFICATION FACTOR = 1.86

This verification factor was applied to the modelled road-NO_x outputs prior to conversion to annual mean NO_2 concentrations.

Particulate Matter (PM_{10} and $PM_{2.5}$)

There are no local PM_{10} or $PM_{2.5}$ monitoring data against which the model could be verified. Consequently, the verification factor determined above for adjusting the road-NO_x contribution has been applied to the predicted road-PM_{10} and road-$PM_{2.5}$ contributions, consistent with guidance set out in LAQM.TG22.

Appendix 3 - Wind Rose for St Bees Head No. 2 (2019)



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NJD Environmental Associates LTD

www.njdenvironmental.co.uk

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