Land off Roslyn Avenue, Netherton

Air Quality Assessment

KCS Development Limited

Prepared by:

SLR Consulting Limited

Floor 3, 86 Princess Street, Manchester, M1 6NG

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Basis of Report

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1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by KCS Development Limited to undertake an air quality assessment to accompany a planning application for the proposed residential development of c.72 dwellings (The Proposed Development) at land off Roslyn Avenue, Netherton, Huddersfield, HD4 7EW (the 'Site').

It is noted that the Site is allocated for residential development within the Kirklees Local Plan Allocations and Designations, reference: HS18.

The Site currently comprises predominantly vacant agricultural land and is located at the approximate National Grid Reference (NGR): x411977, y413045, bounded by:

- Dean Wood directly to the north of the Site, with agricultural land beyond;
- Open land to the west, with residential properties beyond along Midway;
- Residential properties to the Site to the south along Church Lane and Meltham Road and some woodland areas further beyond; and
- Residential properties to the east along Roslyn Avenue and Henry Frederik Avenue, with further residential properties beyond.

1.1 Scope of Assessment

Pre-assessment consultation was undertaken with the Environmental Health Officer (EHO) at Kirklees Council (KC)[1]. The scope of this assessment I is in accordance with the scope of works agreed with KC and based on national and local guidance, as well as established best practice.

The following scope of works has been undertaken:

- Baseline Evaluation;
- Construction Phase Assessment;
- Operational Phase Assessment; and
- Mitigation Measures.

[1] E-mail confirmation received from Rebecca Muff, Principal Technical Officer, KC, dated 17th October 2023.

2.0 Background Context

2.1 Legislation

A dual set of regulations, applicable to National and Local Government separately are currently operable within the UK.

2.1.1 National Obligations

The Air Quality Standards Regulations 2010[2] (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation, in order to align and mirror European obligations. The AQSR includes Limit Values which are legally binding ambient concentration thresholds, however, must be assessed at specific locations (micro and macroscale sampling points). Carriageways or central reservations of roads and any location where the public do not have access (e.g. industrial sites) are exempt. If the sampling point does not comply with the siting locations (Schedule 1: AQSR)[3], then strict comparison cannot be made.

Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[4] was introduced to mirror revisions to supporting EU legislation. The fine particulate matter ($PM_{2.5}$) Limit Value is 20µg/m^3 (to be met by 2020).

The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government and Devolved Administrations who undertake assessments on an annual basis. Local Authorities have no responsibility to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

In response to persistent exceedences, the Government published its 2017 plan[5] for reducing roadside nitrogen dioxide (NO_2) concentrations in order to achieve compliance in the shortest time possible. This has resulted in the introduction of Clean Air Zones across England. However, KC were not identified as required to conduct a feasibility study to achieve compliance.

2.1.1.1 Environment Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[6] introduced an annual mean concentration target of 10µg/m^3 to be met across England by 2040. Central Government and Devolved Administrations is responsible for meeting this target, however not until 2040. Local Authorities have no responsibility to achieve this target.

2.1.2 Local Obligations

Part IV of the Environment Act 1995 (as amended) requires the Secretary of State to publish a national Air Quality Strategy (AQS) every five years and established the system of Local

[2] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

[3] Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

[4] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313, The Stationary Office Limited.

[5] UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations, 2017.

[6] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. UK Statutory Instruments 2023 No. 96.

Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within its area.

The Air Quality (England) Regulations 2000 (as amended) ('the Regulations') provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently cited within the Regulations; Local Authorities are however required to work towards reducing $PM_{2.5}$.

The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (relevant exposure). Table B provides an indication of those locations. Where any of the prescribed Air Quality Objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the objective.

The latest AQS for England was published in 2023[7]. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table A. These are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving – reflective of the Local Planning Authority's duties. The $PM_{2.5}$ AQSR AQAL has also been included for completeness, to provide an indicative assessment (as the sampling point may not comply with the siting locations prescribed under Schedule 1: AQSR).

Table A: Relevant Ambient AQALs

Pollutant	AQAL (µg/m^3)	Averaging Period
(NO_2)	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (PM_{10})	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles ($PM_{2.5}$)	20	Annual mean
Table Notes: The $PM_{2.5}$ AQAL is not prescribed within the Air Quality (England) Regulations 2000 / 2002 and there is no requirement for local authorities to meet it. Exceedences are only valid at specific siting locations (Schedule 1: AQSR).		

Table B: Human Health Relevant Exposure

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
Annual Mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences

[7] Air Quality Strategy: Framework for Local Authority Delivery, Department for Environment Food and Rural Affairs, April 2023.

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
		Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990[8] sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as, 'any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'.

Section 79 requires that, where a complaint of a statutory nuisance is made to it by a person living within its area, a Local Authority must take steps as are reasonably practicable to investigate the complaint and decide whether the odour is prejudicial to health or a nuisance. Proposed developments which result in the introduction of future sensitive receptors are however subject to the Agent of Change principle to ensure potential interactions with the existing environment and operations are assessed and mitigated to minimise restrictions being placed on existing businesses.

Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.2 Policy

2.2.1 National Policy

2.2.1.1 Clean Air Strategy

The 2019 Clean Air Strategy[9] sets out the Government's proposals aimed at delivering cleaner air in England and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.2.1.2 Environment Improvement Plan 2023

The 2023 Environment Improvement Plan[10] is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environment Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution. Goal 2 of the 25YEP is Clean Air – which relates to improving air quality.

[8] The Environmental Protection Act 1990. Available at http://www.legislation.gov.uk/ukpga/1990/43/contents.

[9] The Clean Air Strategy, Defra. January 2019.

[10] Environmental Improvement Plan 2023, Defra. 2023.

2.2.1.3 National Planning Policy Framework

The September 2023 update to the National Planning Policy Framework[11] (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

In specific relation to air quality policy, the document states:

"Chapter 15 - Conserving and Enhancing the Natural Environment

> **Ground Conditions and pollution**
>
> *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."*

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG)[12] which includes guiding principles on how planning can take account of the impacts of new development on air quality. The November 2019 update details several factors that may need to be considered within an air quality assessment. *"Assessments and mitigation options need to be proportionate to the nature and scale of development proposed and potential impacts (taking into account existing conditions)"*.

2.2.2 Local Policy

2.2.2.1 Kirklees Local Plan strategy and policies - Adopted 27th February 2019

Kirklees Local Plan strategy and policies - adopted 27th February 2019[13] sets out the policies necessary to achieve the strategy and the quantum and location of new development within the borough. The plan covers the period 2013-2031.

Within the Local Plan the following relates to air quality:

"Policy LP20 Sustainable travel

> *New development will be located in accordance with the spatial development strategy to ensure the need to travel is reduced and that essential travel needs can be met by forms of sustainable transport other than the private car[…]*
>
> *Proposals should include measures to encourage the use of sustainable travel options, including public transport, the promotion of personal journey planning, walking, cycling, car sharing, electronic communication and home working[…]"*

[11] National Planning Policy Framework, Ministry of Housing, Communities & Local Government. 2023.

[12] Planning Practice Guidance Air Quality, Ministry of Housing, Communities and Local Government. November 2019.

[13] Kirklees Local Plan strategy and policies adopted 27th of February 2019.

"Policy LP21 Highways and access

Proposals shall demonstrate that they can accommodate sustainable modes of transport and be accessed effectively and safely by all users.

Proposals shall demonstrate adequate information and mitigation measures to avoid a detrimental impact on highway safety and the local highway network. Proposals shall also consider any impacts on the Strategic Road Network. All proposals shall:

> *c. be accompanied by a supporting Transport Assessment or Transport Statement where the development would generate significant trip generation, providing detail as to the impact on highway safety, air quality, noise and light restrictions;[…]"*

"Policy LP47 Healthy, active and safe lifestyles

The council will, with its partners, create an environment which supports healthy, active and safe communities and reduces inequality. Healthy, active and safe lifestyles will be enabled by:

> *[…] g. ensuring that the current air quality in the district is monitored and maintained and, where required, appropriate mitigation measures included as part of new development proposals[…]"*

"Policy LP51 Protection and improvement of local air quality

> *1. Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air pollution which would have an unacceptable impact on the natural and built environment or to people.*
>
> *2. Proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by evidence to show that the impact of the development has been assessed in accordance with the relevant guidance. Development which has the potential to cause levels of local air pollution to increase must incorporate sustainable mitigation measures that reduce the level of this impact. If sustainable measures cannot be introduced the development will not be permitted.*
>
> *3. Where the development introduces new receptors into Air Quality Management Areas or Areas of Concern or near other areas of relatively poor air quality, for example near roads or junctions, the development must incorporate sustainable mitigation measures that protect the new receptors from unacceptable levels of air pollution. Where sustainable mitigation measures cannot be introduced which prevent receptors from being exposed to unsafe levels of air pollution, development will not be permitted."*

2.2.2.2 Kirklees Local Plan Allocations and Designations - Adopted 27th February 2019

Kirklees Local Plan Allocations and Designations forms part of the Kirklees Local Plan and sets out the allocations and designations to be safeguarded from development. The following policy relates to the Site:

"Policy LP65 Housing allocations

> *The sites listed below are allocated for housing in the Local Plan. Planning permission will be expected to be granted if proposals accord with the development principles set out in the relevant site boxes, relevant development plan policies and as shown on the Policies Map."*
>
> *The Site is allocated for residential development, reference:*

Site HS18 - Land to the west of Henry Frederick Avenue, Netherton, Huddersfield.

2.3 Assessment Guidance

This assessment has been carried out in accordance with the principles contained within the following guidance documents.

- West Yorkshire Low Emissions Group: Air Quality & Emissions, Technical Planning Guidance, Part of the West Yorkshire Low Emissions Strategy Group (WYLES)[14], herein referred to as the 'WYLES guidance';
- Department for Environment Food and Rural Affairs (Defra): Local Air Quality Management Technical Guidance (LAQM.TG(22))[15];
- Defra: COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021[16];
- Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM): Land-Use Planning and Development Control: Planning for Air Quality[17];
- IAQM: Guidance on the Assessment Dust from Demolition and Construction[18]; and
- IAQM: A guide to the assessment of air quality impacts on designated nature conservation sites[19].

[14] West Yorkshire Low Emissions Group – Air Quality & Emissions, Technical Planning Guidance, Part of the West Yorkshire Low Emissions Strategy (WYLES).

[15] Local Air Quality Management Technical Guidance (22), Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland. August 2022.

[16] Defra and the Greater London Authority, COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021, April 2021.

[17] EPUK and IAQM, Land-Use Planning and Development Control: Planning for Air Quality, v1.2 2017.

[18] IAQM, Guidance on the Assessment Dust from Demolition and Construction, v2.1, August 2023.

[19] IAQM, A guide to the assessment of air quality impacts on designated nature conservation sites, v1.1, May 2020.

3.0 Assessment Methodology

3.1 Development Type Classification

In accordance with the WYLES guidance, the requirements of the air quality assessment are dependent on the development's classification ('minor', 'medium' or 'major').

As the Proposed Development comprises c.72 dwellings, it is therefore considered at least a 'medium' classification development (>50 units). The Proposed Development is compared to additional triggers in Table C to determine whether the development would classify as 'major'.

Table C: Additional Trigger Criteria for Medium Development Classification - Taken from the WYLES Guidance

Criteria	Criteria Met
The Proposed Development does not fall within the Town and Country Planning Environmental Impact Assessment) (England and Wales) Regulations 2011	No
The Proposed Development is located inside an AQMA	No – see Section 6.1
The Proposed Development is not predicted to increase existing traffic flows on roads with >10,000 annual Average Daily Traffic (AADT) flows by 5% or more	No – see Section 6.1
The Proposed Development is not anticipated to cause a 5% increase in traffic on road canyons with >5,000 AADT	No – see Section 6.1
The Proposed Development is not anticipated to introduce or significantly alter congestion and does not include the introduction of substantial road infrastructure changes	No
The Proposed Development is not anticipated to reduce average speeds by more than 10kph	No
The Proposed Development does not include additional Heavy-Duty Vehicle (HDV) movements by more than 10% of total trips	No – see Section 6.1
The Proposed Development does not comprise 'significant' demolition and construction works	No – see Section 6.1

The 'major' development trigger criteria are not met and, as such, the Proposed Development is classified as a 'medium' development in accordance with the WYLES guidance.

3.2 Construction Phase

A construction dust assessment has been undertaken in accordance with IAQM guidance. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

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

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

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

The first stage of the assessment involves a screening to determine if there are sensitive receptors within threshold distances of the Site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- Human receptor is located within 250m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement by a technically competent assessor. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

Given the short-term nature of the construction phase and the comparatively low volume of vehicle movements that will likely arise, it is unlikely that significant air quality effects from development related road traffic emissions during the construction phase will arise. Such potential effects have therefore been scoped out from requiring detailed assessment based on their assumed insignificant impact.

3.3 Operational Phase

3.3.1 Road Traffic Screening Assessment

The assessment of air quality effects in relation to development-generated traffic during the operational phase has been undertaken qualitatively, in accordance with EPUK & IAQM guidance.

The EPUK & IAQM guidance provides a series of indicative screening criteria where, if exceeded, requires further consideration to determine the potential effect on air quality. If the Proposed Development is found not to exceed any of the relevant indicative criteria presented then a detailed impact assessment is consequently not required. Impacts can therefore be described as having an 'insignificant' effect onto local air quality.

The indicative screening criteria relevant for this assessment are as follows (specific to a development located outside of an AQMA):

- A change of Light Duty Vehicle (LDV) flows of more than 500 AADT; and/or
- A change of HDV flows of more than 100 AADT.

3.3.2 Exposure Assessment

In relation to road traffic emissions, an exposure assessment is required to assess the likely exposure that future residents associated with the Proposed Development may experience to ensure the Site is suitable for residential use. As per the WYLES guidance, the exposure assessment is required to consider if:

- The proposal is adjacent to or within an AQMA;
- The proposal is in a location $20m^2$ from roads at or above the relevant national objective highlighted on the Defra GIS modelled maps; and

- The proposal is one of the land use types (and within 20m of roads with >10,000 AADT):
    - C1 to C3;
    - C4 (Homes of Multiple Occupation); and
    - D1.

Furthermore, with consideration of the EPUK & IAQM guidance, the exposure assessment will also consider:

- Background and future baseline air quality and whether this will likely approach or exceed an AQAL;
- The presence and location of an AQMA as an indicator of local hotspots where the AQALs may be exceeded; and
- The presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO_2), that could cause unacceptably high exposure for users of the new development.

A qualitative exposure assessment has been undertaken, with reference to local monitoring data relative to the AQALs (detailed in Table A), to determine whether further consideration is required.

4.0 Baseline Environment

4.1 Baseline Air Quality

Monitoring data not affected by the COVID-19 pandemic has been used to characterise the baseline environment. Pollutant concentrations monitored during 2020 and 2021 are expected to be atypical, and not representative of the local environment and have therefore not been considered as per guidance produced by Defra. 2022 monitoring data for KC is not available in the public domain at the time of drafting this report.

4.1.1 LAQM Review and Assessment

The Site is located within the jurisdiction of KC. The latest publicly available Annual Status Report (ASR) not affected by the COVID-19 pandemic is the 2020 KC ASR[20] (reporting 2019 datasets).

KC presently has ten AQMAs within its administrative area, all declared for exceedences of the NO_2 annual mean AQAL at locations of relevant exposure. These AQMAs are not located in proximity of the Site. The closest AQMA is located approximately 3.8km from the Site. As such, the AQMA has not been considered further.

4.1.2 Review of Air Quality Monitoring

4.1.2.1 Automatic Air Quality Monitoring

KC undertook automatic monitoring within their administrative area at two locations during 2019. These automatic monitors are located >5km from the Site. Due to the separation distance between these monitors and the Site, and the anticipated differences in localised conditions, no further consideration has been given to automatic monitoring network.

4.1.2.2 NO_2 Diffusion Tube Monitoring

NO_2 diffusion tube monitoring was undertaken by KC at numerous locations during 2019 within their administrative area – in fulfilment of their statutory LAQM obligations.

The details and results of the monitoring locations of relevance to the Site are presented in Table D and Table E respectively, whilst their locations are illustrated in Figure A.

Table D: NO_2 Diffusion Tube Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Within AQMA	Distance to Site (km)
		X	Y		
K53	Roadside	411564	415902	No	2.7
K75	Roadside	413153	415894	No	2.9
K76	Roadside	413198	415957	No	3.0
K50	Roadside	413414	415981	No	3.1
K78	Roadside	413464	415983	No	3.2
K77	Roadside	413455	416013	No	3.2
K55	Roadside	414187	408264	No	5.1

[20] Kirklees Council, 2020 Annual Status Report June 2020.

Table E: NO_2 Diffusion Tube Monitoring Sites: Details

Site ID	2019 Data Capture %	Annual Mean NO_2 Concentration (µg/m^3)				
		2015	2016	2017	2018	2019
K53	42	35.1	33.5	28.3	29.4	53.7
K75	17	-	-	32.3	37.8	-
K76	100	-	-	46.6	35.0	28.5
K50	33	45.5	42.1	39.2	45.3	38.2
K78	50	-	-	-	28.0	24.1
K77	83	-	-	24.2	46.9	38.9
K55	75	39.1	33.5	31.9	34.2	29.9

As shown in Table E above, there are multiple exceedences of the NO_2 annual mean AQAL (40µg/m^3) across the presented years.

During 2019, K76, K78 and K55 recorded NO_2 concentrations 'well below' the annual mean AQAL (40µg/m^3).

K53 is the closest diffusion tube to the Site, albeit being situated 2.7km from the Site it is not considered to be representative of onsite conditions. Between 2015 and 2018, K53 displays an overall decreasing trend in roadside NO_2 concentrations – all annual concentrations being considerably below the annual mean AQAL (40µg/m^3). In 2019, K53 recorded an isolated exceedance of the NO_2 annual mean AQAL. It is noted that the recorded NO_2 concentration at K53 is markedly elevated during 2019 and is atypical compared to the previous years monitored. Therefore, the NO_2 concentration during 2019 at K53 is considered to be potentially unrepresentative.

K77 and K50 recorded annual mean NO_2 concentrations close the AQAL (40µg/m^3) in 2019. These monitors are roadside of a major road (Manchester Road), and K77 is located within a potential street canyon which is likely to limit dispersion of traffic emissions. Therefore, concentrations at these monitors can be expected to be elevated in comparison to the concentrations expected at the Site.

The empirical relationship given in LAQM.TG(22) states that exceedences of the 1-hour mean NO_2 AQAL are unlikely where annual mean concentrations are <60µg/m^3. This indicates that exceedences of the 1-hour mean NO_2 AQAL are unlikely to have occurred at these sites between 2015 and 2019.

4.1.3 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include annual average concentration estimates for NO_2, PM_{10} and $PM_{2.5}$ using a base year of 2018 (the year in which comparisons between modelled and monitoring are made).

The Defra mapped background concentrations for the baseline year (2019) and the earliest predicted opening year of the development (2025) based on the 1km grid squares which cover the Site area, are presented in Table F.

All of the mapped background concentrations presented are well below the respective annual mean AQALs.

Table F: Defra Mapped Background Pollutant Concentrations

Grid Square (X,Y)	Year	Annual Mean Concentration (µg/m^3)		
		NO_2	PM_{10}	$PM_{2.5}$
412500, 412500	2019	8.7	9.8	6.5
	2025	7.1	9.1	6.0
411500, 413500	2019	8.6	9.9	6.6
	2025	7.1	9.2	6.1
AQAL		***40***	***40***	***20***

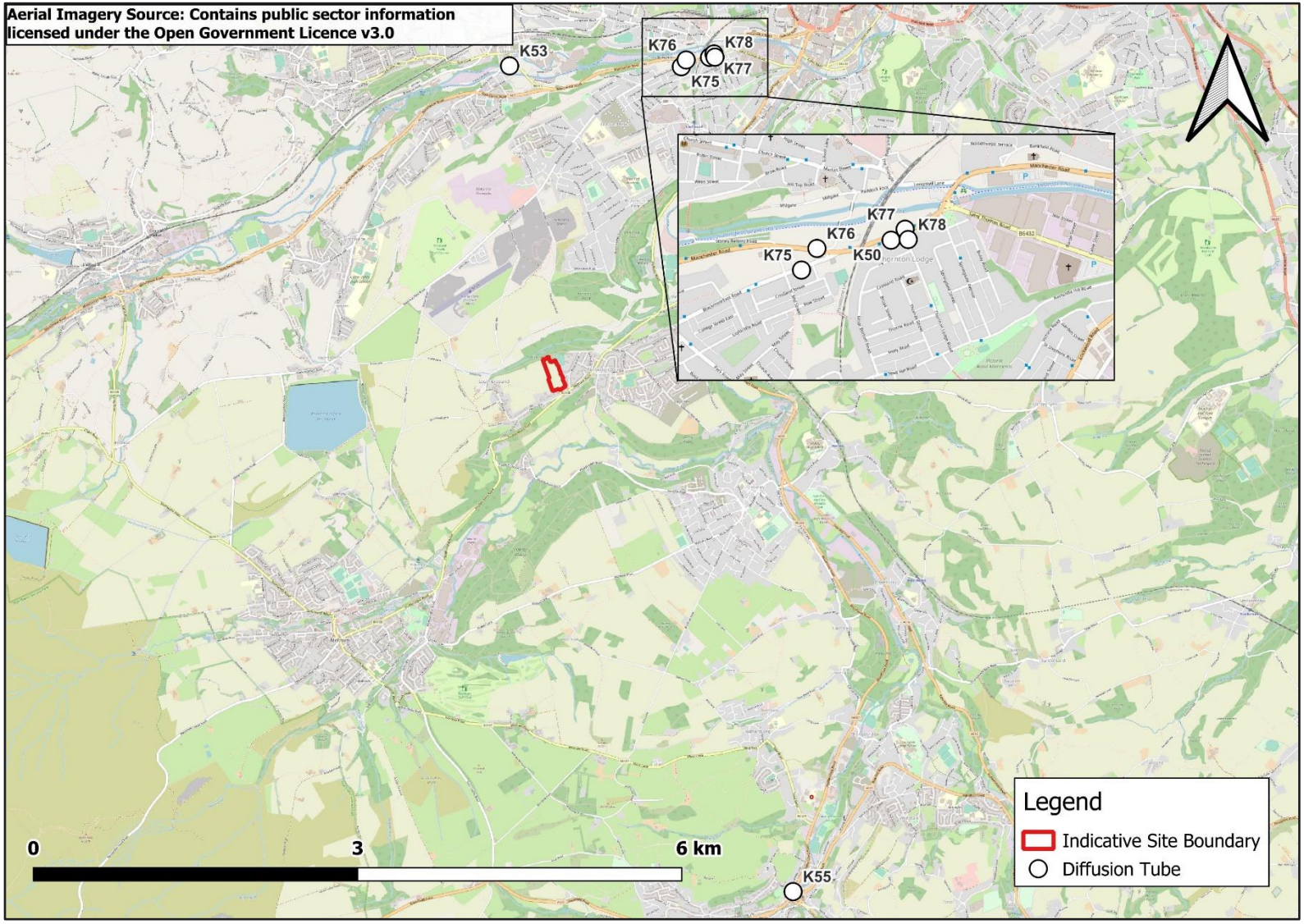


Figure A: Site Setting and Local Monitoring

5.0 Construction Phase Assessment

This section presents the potential air quality impacts and effects associated with the construction of the Proposed Development.

5.1 Construction Dust Assessment

Where figures relating to area and volume of the Site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1.1 Assessment Screening

There are 'human receptors' within 250m of the Site and designated habitat sites within 50m of the Site boundary or within 50m of the roads anticipated to witness construction traffic movements up to 250m of the Site entrance. Therefore, an assessment of construction dust on human receptors and ecological receptors is required.

5.1.2 Potential Dust Emissions Magnitude

5.1.2.1 Demolition

The Site comprises vacant agricultural land and contains no structures that require demolition. As such, impacts associated with demolition have been screened out of this assessment.

5.1.2.2 Earthworks

The total site area is between 18,000m^2 and 110,000m^2. It is anticipated that 5-10 heavy earth moving vehicles will be active at any one time. The dust emission magnitude for earthworks is therefore considered to be 'medium'.

5.1.2.3 Construction

The total building volume associated with the Proposed Development is predicted to be between 12,000m^3 and 75,000m^3. The dust emission magnitude for construction is therefore considered to be 'medium'.

5.1.2.4 Trackout

Construction vehicles are likely to access the Site via Roslyn Avenue to the east of the Site. No details are available at the time of the assessment regarding the number of HDV movements associated with construction works. However, the number of predicted outward HDV movements in any one day would likely be between 20 and 50 at any point during construction. The dust emission magnitude for trackout is therefore considered to be 'medium'.

5.1.2.5 Summary

A summary of the potential dust emission magnitude for each of the activities is displayed in Table G.

Table G: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Earthworks	Medium

Activity	Dust Emission Magnitude
Construction	Medium
Trackout	Medium

5.1.3 Sensitivity of the Area

5.1.3.1 Dust Soiling Impacts

There are 10-100 residential (high sensitivity) receptors within 20m of the Site. There are also 10-100 residential (high sensitivity) receptors located within 20m of the access routes up to 200m from the Site entrance – commensurate of a medium site[21].

The sensitivity of the area with respect to dust soiling effects on people and property in relation to earthworks and construction is therefore considered to be 'medium' and for trackout it is therefore considered to be 'high'.

5.1.3.2 Human Health Impacts

The maximum 2019 mapped background PM_{10} concentration (2018 reference year) for the $1km^2$ grid square centred on the Site is estimated to be $9.9\mu g/m^3$ (i.e. falls into the $<24\mu g/m^3$ class).

Given the above information regarding the number of residential receptors within 20m of the Site boundary and residential receptors within 20m of the identified trackout routes, the sensitivity of the area with respect to human health impacts in relation to earthworks, construction and trackout is therefore considered to be 'low'.

5.1.3.3 Ecological Impacts

The Site borders an ecological receptor of low sensitivity (Dean Wood Ancient Woodland Site). The sensitivity of the area with respect with ecological impacts is 'medium'.

5.1.3.4 Summary

A summary of the sensitivity of the area defined for each potential impact is displayed in Table H, whereas the spatial densities of receptors discussed in relation to the Site boundary are illustrated in Figure B.

Table H: Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling Impacts	High	High	High
Human Health Impacts	Low	Low	Low
Ecological Impacts	Medium	Medium	Medium

[21] As per the IAQM's 'Guidance on the Assessment of Dust from Demolition and Construction', without site-specific mitigation, trackout may occur along the public highway up to 500m from large sites, 200m from medium sites and 50m from small sites, as measured from the site exit.

5.1.4 Risk of Impacts (Unmitigated)

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined in Table I below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table I: Risk of Dust Impacts (Unmitigated)

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling Impacts	Medium Risk	Medium Risk	Medium Risk
Human Health Impacts	Low Risk	Low Risk	Low Risk
Ecological Impacts	Medium Risk	Medium Risk	Medium Risk

5.1.5 Mitigation

Following the construction dust assessment, the Proposed Development is found to be at worst 'medium risk' in relation to dust soiling effects on people and property, 'low risk' in relation to human health impacts and 'medium risk' in relation to ecological impacts. However, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

Nonetheless, commensurate with the above designation of dust risk, mitigation measures as identified by IAQM guidance are required to ensure that any potential impacts arising from the construction phase of the Proposed Development are reduced and, where possible, completely removed. In accordance with IAQM guidance, providing effective mitigation measures are implemented, such as those outlined in Section 7.1, construction dust effects are considered to be 'not significant'.

Figure B: Construction Dust Assessment Buffers

6.0 Operational Phase Assessment

This section presents the potential air quality impacts and effects associated with the operation of the Proposed Development.

6.1 Road Traffic Screening Assessment

Optima Highways, the appointed transport consultants for the Proposed Development, have provided the total and distributed road traffic flows generated by the Proposed Development as 24-hour AADT split into LDV and HDV, as presented in Table J.

Table J: Maximum Generated Proposed Development Trip Generation

Road Name	LDV AADT	HDV AADT
Roslyn Avenue (Site access)	472	5
Roslyn Avenue (east)	44	0
Henry Frederik Avenue	218	2
B6108 Meltham Road	317	3
EPUK & IAQM Screening Criteria	***500***	***100***

In accordance with the EPUK & IAQM Guidance, developments not located within or adjacent to an AQMA require consideration of potential air quality impacts where additional development trips are in excess of 500 AADT as LDV trips or 100 AADT as HDV trips.

In reference to the data presented within Table J, the distributed development trips generated by the Proposed Development are found to be below the relevant EPUK & IAQM screening criteria (i.e. <500 LDVs and <100 HDVs). As such, road traffic impacts associated with the operation of the Proposed Development can be considered as having an 'insignificant' effect on local air quality and no further assessment is required.

6.2 Exposure Assessment

With reference to information already discussed in Section 3.3.2, the following has been used to inform the suitability of the Site, relative to its proposed residential use.

In consideration of the WYLES guidance:

- The Site is not located within or in close proximity to an AQMA;
- The Site is not located within 20m^2 from roads at or above the relevant national objective highlighted on the Defra GIS modelled maps; and
- The Proposed Development is considered to comprise land use type C3 but is not considered to be located within 20m of roads with >10,000 AADT.

With reference to information previously discussed in Section 4.0, the following has also been used to inform the suitability of the Site, relative to its proposed residential use in consideration of the EPUK & IAQM guidance:

- The nearest AQMA to the Site is approximately 3.6km north east (the Kirklees AQMA 9), and as such the Site is not situated within an area of known poor air quality;
- None of the surrounding KC roadside diffusion tube monitoring locations are considered to be representative of the Site (as discussed within Section 4). It is considered likely that air quality conditions at these roadside monitoring locations are markedly worse than the conditions experienced on Site, based on the relative distance to the adjacent road network (with the proposed future

residential properties being situated approximately 90m from the B6108 - the primary source of potential road traffic emissions);

- Defra mapped background concentrations are 'well below' the relevant NO_2, PM_{10} and $PM_{2.5}$ AQALs for the 1km grid square containing the Site in 2019 (base year) and 2025 (earliest anticipated opening year); and
- As discussed above, at the closest point the future residential properties will be situated approximately 90m from the B6108 (the primary source of potential road traffic emissions). Moreover, there are currently existing dwellings in closer proximity to the B6108. Therefore, the Site is considered suitable for proposed residential use and no further assessment is required.

6.2.1 Summary

Overall, the findings of the exposure assessment show the Site is suitable for the proposed residential use, and no further assessment is required. Effects associated with the likely exposure of future occupants in relation to NO_2, PM_{10} and $PM_{2.5}$ concentrations are considered to be 'not significant' and no further mitigation measures are required.

7.0 Mitigation Measures

This section presents any proportionate mitigation measures required during the construction and operational phases of the Proposed Development.

7.1 Construction Dust

As discussed in Section 5.0, construction impacts associated to the Proposed Development would result in the generation of dust and PM_{10}.

In order to control potential impacts, Table K presents a range of mitigation measures which could be applied and align with the IAQM guidance. With the effective application of the dust mitigation measures, residual effects will be 'not significant'.

Table K: Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Highly Recommended	
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Operating Vehicle / Machinery and Sustainable Travel	Ensure all vehicles switch off 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.
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Site Application	Mitigation Measures
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
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 offsite, and the action taken to resolve the situation in the log book.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

Site Application	Mitigation Measures
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.
Waste Management	Avoid bonfires and burning of waste materials.
Desirable	
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
	Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable
	Only remove the cover in small areas during work and not all at once.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
With respect to operating vehicle/machinery and sustainable travel	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

7.2 Operational Phase

In accordance with the EPUK & IAQM guidance, road traffic impacts associated with the operation of the Proposed Development can be considered as having an insignificant effect on local air quality. As such, long-term scheme-specific mitigation measures in relation to operational effects arising from road traffic emissions are therefore not considered to be necessary.

Notwithstanding the above, in line with the WYLES guidance, the development classification is initially found to be ‘medium’. As such, it is required to implement the following Type 1 & Type 2 mitigation measures:

- 1 electric vehicle (EV) charging point per unit (dwelling with dedicated parking) or 1 charging point per 10 spaces (unallocated parking);

- A travel plan including agreed mechanisms for discouraging high emission vehicle use and encouraging modal shift (i.e. public transport, cycling and walking) as well as the uptake of low emission fuels and technologies;
- Improved pedestrian links to public transport stops;
- Provision of new bus stops infrastructure including shelters, raised kerbing, information displays;
- Provision of subsidised or free ticketing (Corporate and residential Metrocards, Student Metrocards);
- Site layout to include improved pedestrian pathways to encourage walking; and
- Improved convenient and segregated cycle paths to link to local cycle network.

8.0 Conclusions

SLR Consulting Ltd has been commissioned by KCS Development Limited to undertake an air quality assessment to accompany a planning application for the proposed residential development of c.72 dwellings at land off Roslyn Avenue, Netherton, Huddersfield, HD4 7EW.

8.1 Construction Phase

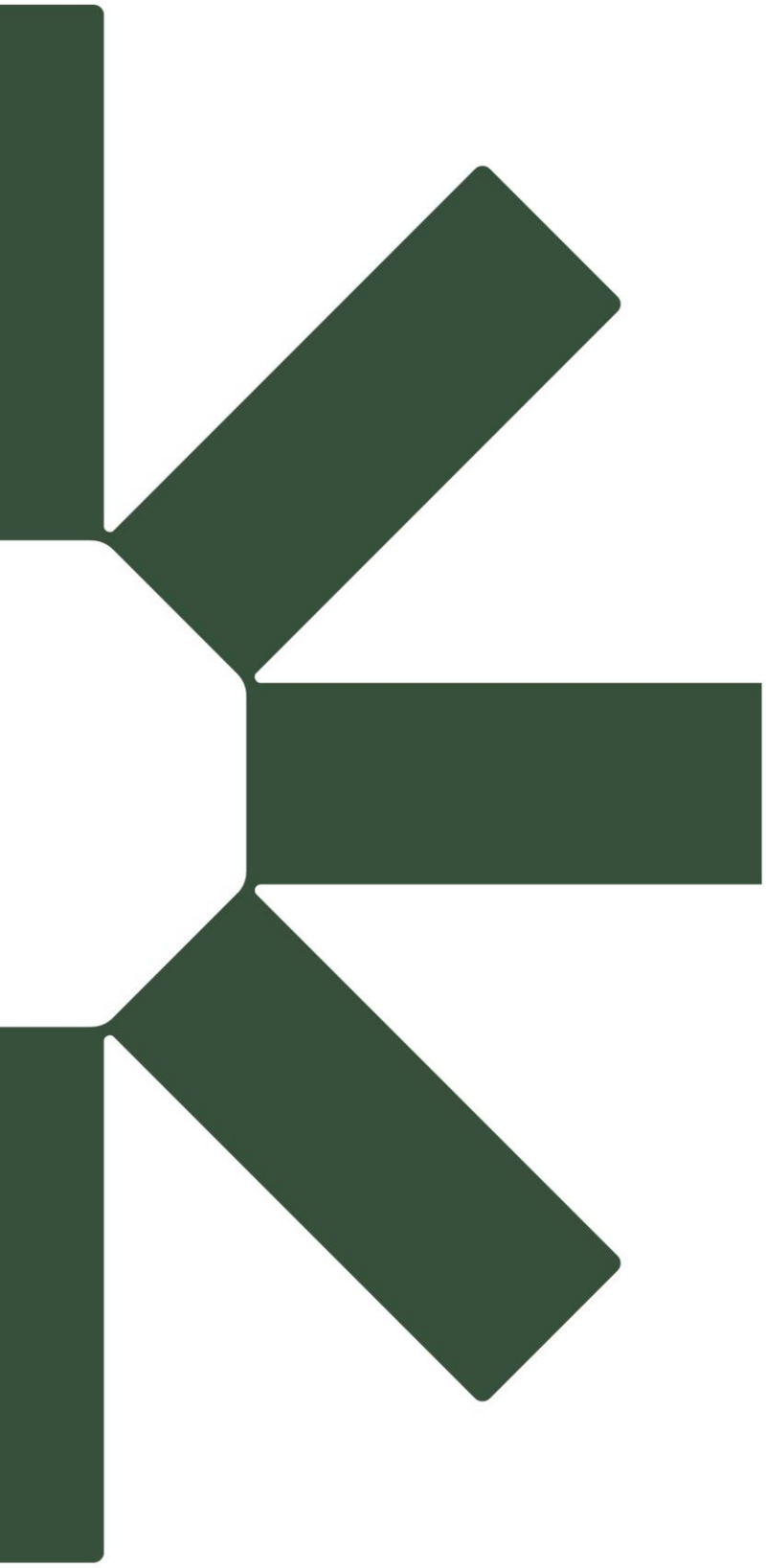
A qualitative assessment of the potential dust impacts during the construction of the Proposed Development has been undertaken following the IAQM guidance.

Following the construction dust assessment, the Proposed Development is found to be at worst 'medium risk' in relation to dust soiling effects on people and property, and 'low risk' to human health impacts and 'medium risk' in relation to dust soiling effects on ecological impacts. Providing effective mitigation measures are implemented, such as those outlined in Section 7.1 of this report, residual effects from dust emissions during the construction phase would be 'not significant'.

8.2 Operational Phase

The Proposed Development is expected to generate road traffic volumes below the relevant EPUK & IAQM 'indicative criteria for assessment.' As such, road traffic impacts associated with the operation of the Proposed Development can be considered as having an insignificant effect on local air quality.

A qualitative exposure assessment has been undertaken following the WYLES guidance and the EPUK & IAQM guidance, with reference to publicly available air quality datasets to determine the suitability of the Site for its proposed residential use. The Site is considered to be suitable for the proposed residential use without the inclusion of scheme-specific mitigation measures. Effects associated with the likely exposure of future occupants in relation to NO_2, PM_{10} and $PM_{2.5}$ concentrations are considered to be 'not significant'.



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