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LIDL GB LTD

PROPOSED LIDL FOODSTORE, CROSLAND MOOR

AIR QUALITY ASSESSMENT

APRIL 2023

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AIR QUALITY ASSESSMENT

APRIL 2023

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APPENDICES

DRAWINGS	**TITLE**
GM12449-001	Existing Sensitive Receptor Locations

EXECUTIVE SUMMARY

An air quality assessment has been undertaken to accompany a planning application for the erection of a foodstore (Use Class E) with associated access, parking, servicing area and landscaping, at the former St Luke's Hospital site at Blackmoorfoot Road, Crosland Moor, Huddersfield

The assessment considers dust and fine particulate matter emissions during the construction phase and road traffic emissions during the operational phase of the development.

During the construction phase, the risk of dust soiling effects is classed as medium for earthworks and construction and low for trackout; the risk of human health effects is classed as low for earthworks and construction and negligible for trackout. Mitigation measures, based on best practice guidance, are proposed to further reduce any potential impacts.

For the operational phase assessment, annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations have been modelled at twenty-three existing receptor locations using the most recent Emission Factor Toolkit available from DEFRA (v 11.0). Predicted annual mean pollutant concentrations have been compared to the relevant air quality objectives and target level.

The operational phase assessment concludes that the development will result in concentrations of NO_2, PM_{10} and $PM_{2.5}$ remaining below the air quality objectives/target values, both without and with the development for the proposed 2025 opening/future year. The impact of the development during the operational phase is predicted to be negligible at all twenty-three existing sensitive receptors that have been considered. Air quality effects are therefore considered to be 'not significant'.

The assessment demonstrates that the proposed development will not lead to an unacceptable risk from air pollution or to any breach in national objectives and is, therefore, compliant with relevant national policy. Therefore, there are no material reasons in relation to air quality why the proposed scheme should not proceed, subject to appropriate planning conditions.

1 INTRODUCTION

1.1 Background

1.1.1 Wardell Armstrong LLP (WA) has been commissioned by Lidl GB Ltd to undertake an air quality assessment to accompany a planning application for the erection of a foodstore (Use Class E) with associated access, parking, servicing area and landscaping, at the previous St Luke's Hospital site off Blackmoorfoot Road, Crosland Moor, Huddersfield.

1.1.2 The proposed development site forms a small section of the previous hospital site and is currently derelict land, with existing and forthcoming new housing located to the south and west. The north of the site is bordered by Blackmoorfoot Road and existing residential dwellings beyond. There are further existing residential dwellings off Blackmoorfoot Road to the north west. The east of the site is bordered by Turnstone Way with more existing residential dwellings beyond off Chapel Terrace.

1.1.3 The proposals are for a Lidl foodstore with a total of 90 car parking spaces, two of which are allocated for Electric Vehicle (EV) charging.

1.1.4 This report details the results of the air quality assessment undertaken to accompany the planning application for the proposed development. The report discusses the potential dust and fine particulate matter impacts associated with the construction phase, and an assessment of the potential air quality impacts of the additional road traffic generated by the proposed development.

1.1.5 Air pollutant concentrations are considered at existing sensitive receptor locations in the vicinity of the proposed development. The locations of these are shown in Drawing GM12449-001. As there are no residential uses proposed, the assessment has not considered any proposed receptor locations within the development site.

2 LEGISLATION AND POLICY CONTEXT

2.1 Relevant Air Quality Legislation and Guidance

2.1.1 The air quality assessment has been undertaken in accordance with the following legislation and guidance (further details are included in **Appendix A**):

- The Environment Act 2021, as amended 2021;
- Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007;
- The Air Quality Standards Regulations 2010;
- Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(22), August 2022;
- Ministry of Housing, Communities and Local Government, National Planning Policy Framework, July 2021; and
- Department for Communities and Local Government, Planning Practice Guidance: Air Quality, November 2019.

2.2 Assessment Criteria

2.2.1 The relevant air quality objectives and limit values for this assessment are included within Table 1.

Table 1: Air Quality Objectives and Limit Values Relevant to the Assessment*

Pollutant	Objective/Limit Value	Averaging Period	Obligation
Nitrogen Dioxide (NO_2)	200µg/m^3, not to be exceeded more than 18 times a year	1-hour mean	All local authorities
	40µg/m^3	Annual mean	All local authorities
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	England, Wales and Northern Ireland
	40µg/m^3	Annual mean	England, Wales and Northern Ireland
Particulate Matter ($PM_{2.5}$)	Limit Value of 20µg/m^3	Annual mean	England, Wales and Northern Ireland

**In accordance with the Air Quality Standards Regulations 2010*

2.2.2 Further details of where these objectives and limit values apply are detailed in **Appendix A**.

3 ASSESSMENT METHODOLOGY

3.1 Consultation

3.1.1 The assessment methodology was discussed with Ms Rebecca Muff, Principal Technical Officer at Kirklees Council (KC), via email correspondence, between 24th August and 15th September 2022.

3.1.2 A summary of the consultation undertaken is provided in Table 2.

Table 2: Summary of Consultation

Assessment Stage	Proposed Method	Response
Construction phase assessment to consider dust and fine particulate matter (PM_{10})	Qualitative assessment in accordance with Institute of Air Quality Management (IAQM) guidance	No objection to method
Operational phase assessment to consider nitrogen dioxide (NO_2) and fine particulate matter (PM_{10} and $PM_{2.5}$)	Detailed assessment using the ADMS-Roads atmospheric dispersion model, in accordance with Environmental Protection UK (EPUK)/IAQM guidance, and with all predicted concentrations compared to air quality objectives/limit values	No objection to method
	2019 meteorological data from Emley Moor 2 recording station	No objection to method
	Background concentrations from 2018-based DEFRA default maps	Comments received – see below
	Assessment undertaken using EFT v11.0 emission factors.	No objection to method
	Model verification using roadside diffusion tubes K75-78 and K50	No objection to method
	The proposed development is classed as 'medium' in accordance with the Air Quality & Emissions Technical Planning Guidance and so an emissions mitigation assessment is not required.	No response received

3.1.3 Ms Muff replied via email on the 25th August and to state "*Overall we agree with the approach and methodology for both the construction and operational phases*", however Ms Muff provided some additional comments on certain aspects of the methodology.

3.1.4 In response to the proposed use of the 2018 based Defra background maps to obtain background pollutant concentrations, Ms Muff stated she would expect the concentrations to be "*taken from the 2019 Defra concentration maps, as you have stated in point 4 that the verification and baseline year is likely to be 2019*". This

appears to be a miscommunication as the assessment will in fact use 2019 background concentrations (the same as the base year scenario), but these are based on the latest 2018-based background concentration maps available from Defra.

3.1.5 The proposed development is classed as a 'medium' development, in accordance with the Air Quality & Emissions Technical Planning Guidance (part of West Yorkshire Low Emissions Strategy) and therefore an emissions mitigation assessment is not required. Instead of this, a detailed Travel Plan should be provided. A Travel Plan prepared by Bryan G Hall accompanies this planning application. An email was sent to Ms Muff on 15th September to obtain agreement with this approach, however, at the time of writing no response has been received.

3.1.6 It was also requested that consideration be given to the air quality impacts from traffic generated by the proposed development on the nearest Air Quality Management Area (AQMA). Further detail is given on this in Section 5 of this report.

3.1.7 Since consultation with Ms Muff was undertaken, further review of the available diffusion tubes for use in verifying the model has highlighted that diffusion tube K75 has insufficient data capture for 2019 and so this has been excluded from the verification procedure. Diffusion tube K78 is located along a road for which detailed traffic data was not available, and so this tube has also been removed from the model verification procedure. Further details of the diffusion tubes used in the assessment is given in **Appendix C**.

Scope of Assessment

3.2 Construction Phase Assessment

3.2.1 To assess the impacts associated with dust and fine particulate matter releases during the construction phase of the development, an assessment has been undertaken in accordance with guidance from the Institute of Air Quality Management (IAQM)[1]. Further details of the construction assessment methodology are provided in **Appendix B**.

3.2.2 The closest sensitive human receptors to where construction phase activities will take place are residential in nature and are detailed in Table 3. However, it should be noted that the assessment includes consideration of all sensitive receptors within 350m of the site boundary, in accordance with IAQM guidance.

[1] Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, June 2016

Table 3: Closest Existing Sensitive Receptors Considered in the Construction Phase Assessment		
Receptor	**Direction from the Site**	**Approximate Distance from the Site Boundary (m)**
Existing Residential Properties off Blackmoorfoot Road	North/North east	Approximately 20m at closest point
Existing Residential Properties off Blackmoorfoot Road	North west	Approximately 10m at closest point
Existing Residential Properties off Chapel Terrace	East	Approximately 20m at closest point
Existing Residential Properties off Turnstone Way	South	Immediately adjacent at closest point
Existing Residential Properties off Turnstone Way	West	Immediately adjacent at closest point

3.2.3 There are no ecological receptors, or potentially dust sensitive statutory designated habitat sites, within 50m of the site and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). Ecological effects do not therefore need to be considered within this assessment.

3.2.4 The criteria used to assess the construction impact of the proposed development, and the associated significance of effects at existing sensitive receptors, are included in **Appendix B**.

3.3 Operational Phase Assessment

3.3.1 The air dispersion model ADMS-Roads (CERC, Version 5.0.1) has been used to assess the impacts associated with road traffic emissions during the operational phase assessment. The impacts have been assessed in accordance with guidance from Environmental Protection UK (EPUK) and the IAQM[2]. Further details of the modelling and assessment methodology are provided in **Appendix C**.

3.3.2 NO_2, PM_{10} and $PM_{2.5}$ concentrations have been predicted at existing sensitive receptors, as these are the pollutants considered most likely to exceed the objectives and limit values.

[2] Moorcroft and Barrowcliffe et al, Land-Use Planning and Development Control: Planning for Air Quality (v1.2), January 2017

3.3.3 Air dispersion modelling has been carried out to estimate pollutant concentrations, due to road traffic emissions, for three assessment scenarios as follows:

- **Scenario 1:** 2019 Verification and Base Year, the most recent year for which traffic flow information, local monitored pollution data and meteorological data is available;
- **Scenario 2:** 2025 Opening/Future Year, without the proposed development in place, but including committed developments;
- **Scenario 3:** 2025 Opening/Future Year, with the proposed development in place and including committed developments;

3.3.4 The committed developments included in the traffic data are:

- Black Cats Residential - planning application reference 2020/60/92546/W
- Residential units on the wider St Luke's Hospital site - planning application reference 2018/62/93200/W

Existing Sensitive Receptors

3.3.5 A number of representative existing sensitive receptors (identified as ESR 1 to ESR 23) have been selected for consideration in the air quality assessment. These have been chosen based on their sensitivity and their proximity to roads which will be affected by development generated traffic.

3.3.6 Details of the receptors considered are provided in Table 4, and their locations are shown on drawing GM12449-001.

Table 4: Existing Sensitive Receptors Considered in Operational Phase Assessment

Receptor	Location	Grid Reference		Receptor Type
		Easting	Northing	
ESR 1	Blackmoorfoot Road	412531	415602	Residential
ESR 2	Chapel Terrace	412557	415599	Residential
ESR 3	Turnstone Way	412585	415468	Residential
ESR 4	Blackmoorfoot Road	412634	415650	Residential
ESR 5		412752	415716	Residential
ESR 6	Park Road West	412754	415742	Residential

Table 4: Existing Sensitive Receptors Considered in Operational Phase Assessment				
Receptor	Location	Grid Reference		Receptor Type
		Easting	Northing	
ESR 7	Park Road West	412514	415802	Residential
ESR 8	A62 Manchester Road	412511	415869	Residential
ESR 9	Birkhouse Lane	413253	415969	Residential
ESR 10	A62 Manchester Road	413257	415959	Residential
ESR 11		413434	415991	Residential
ESR 12		413456	416014	First Floor Residential
ESR 13		413467	416004	Residential
ESR 14	Longroyd Lane	413431	416157	Residential
ESR 15	A62 Manchester Road	413630	416156	First Floor Residential
ESR 16	Blackmoorfoot Road	413163	415896	Residential
ESR 17	Blackmoorfoot Road	412484	415551	Residential
ESR 18	Oak Church of England Primary School	412260	415274	School
ESR 19	Blackmoorfoot Road	412142	415203	Residential
ESR 20	Blackmoorfoot Road	411620	414526	Residential
ESR 21	Sandhouse Lane	411556	414465	First Floor Residential
ESR 22	Park Road	412778	415709	Residential
ESR 23		412839	415678	Residential

3.3.7 The criteria used to assess the operational impact of the proposed development, and the associated significance of effects at existing sensitive receptors, are included in **Appendix C**.

Proposed Sensitive Receptors

3.3.8 Proposed sensitive receptors have not been considered within this air quality assessment as the development is not for residential purposes.

3.4 Limitations and Uncertainties

3.4.1 Air quality assessments make use of official sources of information (i.e., vehicle emission factors and background concentrations) which are increasingly considered to be overly optimistic. Monitoring data collected by the UK Government and local authorities shows that annual mean NO_2 concentrations have remained higher than previously expected (especially in roadside locations). This is widely thought to be due to the lower-than-expected decline in NO_x emissions from diesel vehicles (even as new Euro standards have been introduced), coupled with an overall increase in the number of diesel vehicles on the road.

3.4.2 The vehicle emission factors used in this assessment are from Defra's Emission Factor Toolkit (EFT v11.0)[3], which is the most up-to-date version available.

3.4.3 A position statement was produced by the IAQM in 2018 which dealt specifically with the use of EFT v8.0 and the consideration of uncertainties in predicting future air quality[4]. The statement concluded that the approaches for dealing with this uncertainty should be decided on a case-by-case basis but may include the use of a sensitivity test in which it is assumed that NO_x emissions will not reduce as quickly over time as within the EFT.

3.4.4 A later study provided evidence that EFT v9.0 may be relied upon to predict the 'most likely' future emissions reductions, as long as model verification has been undertaken using monitored data from 2016 or later[5].

3.4.5 The IAQM has recently withdrawn their 2018 position statement on the consideration of uncertainties in predicting future air quality[6]. A growing body of evidence suggests that the latest COPERT vehicle emission factors used in EFT v9.0 (and later) reflect real-world NO_x emissions more accurately. As a result, the IAQM judge that "an exclusively vehicle emissions-based sensitivity test is no longer necessary". This is provided that

[3] Defra Local Air Quality Management webpages (https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html)
[4] Institute of Air Quality Management, Dealing with Uncertainty in Vehicle NO_x Emissions within Air Quality Assessments v1.1, July 2018
[5] Air Quality Consultants, Performance of Defra's Emission Factor Toolkit 2013 – 2019, February 2020
[6] Available on the Institute of Air Quality Management website (https://iaqm.co.uk/wp-content/uploads/2013/02/iaqm_uncertainty_vehicle_NOx_emission_withdrawn-02.pdf)

the assessment has been verified using monitoring data from 2016 or later.

3.4.6 In accordance with Defra guidance, the air quality assessment has been carried out using EFT v11.0. As model verification has been undertaken, following the latest guidance from the IAQM, it is not considered necessary to carry out a sensitivity analysis. Further information on the vehicle emission factors used in the assessment are provided in **Appendix C**.

3.4.7 Several steps have been taken to ensure the model is as accurate and representative as possible. These comprise:

- Consultation has been undertaken with KC to confirm their agreement with the methodology used within the assessment;
- Detailed traffic data has been obtained from the appointed transport consultant;
- The latest Defra LAQM tools have been incorporated into the assessment following their release in November 2021;
- Meteorological data, obtained from a representative meteorological recording station, has been incorporated into the assessment;
- Road widths and the location of ESRs in relation to each road have been measured in detail to ensure greater accuracy within the model; and
- The nearby Council-operated diffusion tube monitoring locations (REF: K49, 50, 76 and 77) have been considered within the assessment to allow model verification to take place. Model verification factor(s) have been applied to NO_x concentrations, which are then input into the Defra NO_x to NO_2 calculator tool to predict total NO_2 concentrations at each receptor considered in the assessment.

4 BASELINE SITUATION

4.1 Kirklees Council Local Air Quality Management

4.1.1 The proposed development site is located within the administrative area of Kirklees Council (KC), which is responsible for the management of local air quality.

4.1.2 There are currently ten AQMA's declared across KC's jurisdiction, nine of which have been declared for exceedances of the annual mean NO_2 objective. The Kirklees AQMA 2 was declared for the exceedance of the PM_{10} 24 hour mean objective, however, it is stated in the 2021 Annual Status Report (ASR) for KC that this AQMA is to be revoked.

4.1.3 The proposed development is not located within any of the ten declared AQMA's and is therefore not in a known area of poor air quality. The nearest AQMA to the proposed development is the Kirklees AQMA 9, which is located approximately 1.8km to the north west.

4.1.4 There are several roadside NO_2 diffusion tubes located along the road network included in the modelling assessment. Monitoring data for 2019, provided by KC within the 2021 ASR, shows monitored annual mean NO_2 concentrations ranging between 28.53 µg/m^3 and 38.88 µg/m^3 during 2019.

4.2 Background Air Pollutant Concentrations

4.2.1 The air quality assessment needs to take into account background concentrations upon which the local, traffic derived pollution is superimposed.

4.2.2 As there are currently no representative NO_2, PM_{10} or $PM_{2.5}$ background monitoring locations in the vicinity of the proposed development site, background concentrations have been obtained from the 2018-based Defra default concentration maps, for the appropriate years and grid squares[7].

4.2.3 The background pollutant concentrations used in this assessment are detailed in Table 5.

Table 5: Background Pollutant Concentrations Used in the Air Quality Assessment*

Pollutant	Annual Mean Concentrations (µg/m^3)			
	NOx	NO_2	PM_{10}	$PM_{2.5}$
2019 Base Year				
ESR 1 – 8, 17-19 & 22-23 (412500, 415500)	16.15	12.06	11.87	8.26

[7] Accessed through the Defra Local Air Quality Management webpages (http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html)

ESR 9-11 & 16 (413500, 415500)	21.62	15.55	12.42	8.67
ESR 12-15 (413500, 416500)	20.04	14.58	11.51	7.98
ESR 20-21 (411500, 414500)	12.56	9.59	10.54	6.92
2025 Opening/Future Year				
ESR 1 – 8, 17-19 & 22-23 (412500, 415500)	12.93	9.84	11.10	7.70
ESR 9-11 & 16 (413500, 415500)	17.63	12.97	11.61	8.08
ESR 12-15 (413500, 416500)	15.99	11.91	10.73	7.40
ESR 20-21 (411500, 414500)	10.13	7.85	9.82	6.39
**Obtained from the Defra 2018-based background maps*				

4.3 Modelled Baseline Concentrations at Existing Sensitive Receptors

4.3.1 The baseline assessment (i.e., scenarios 1 and 2) has been carried out for the existing sensitive receptors considered, in accordance with Defra guidance (i.e., using EFT v11.0). The adjusted NO_2 and unadjusted PM_{10} and $PM_{2.5}$ concentrations are detailed in Table 6.

Table 6: Predicted Adjusted NO_2 and Unadjusted PM_{10} and $PM_{2.5}$ Concentrations at Existing Sensitive Receptors for Scenarios 1 and 2

Receptor	Calculated Annual Mean Concentrations (µg/m^3)					
	Scenario 1: 2019 Base Year			Scenario 2: 2025 Opening Year, Without Development but including committed development		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
ESR 1	17.73	12.31	8.52	14.47	11.73	8.05
ESR 2	18.62	12.38	8.56	15.30	11.84	8.11
ESR 3	12.98	11.94	8.30	10.71	11.22	7.76
ESR 4	20.47	12.52	8.64	16.74	12.05	8.22

Table 6: Predicted Adjusted NO_2 and Unadjusted PM_{10} and $PM_{2.5}$ Concentrations at Existing Sensitive Receptors for Scenarios 1 and 2

Receptor	Calculated Annual Mean Concentrations (µg/m³)					
	Scenario 1: 2019 Base Year			Scenario 2: 2025 Opening Year, Without Development but including committed development		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
ESR 5	25.90	12.64	8.72	20.68	12.13	8.28
ESR 6	29.80	12.84	8.85	21.75	12.24	8.34
ESR 7	19.14	12.43	8.58	13.91	11.68	8.02
ESR 8	21.10	12.59	8.68	14.90	11.83	8.10
ESR 9	32.55	13.36	9.24	23.65	12.63	8.66
ESR 10	34.45	13.46	9.30	25.64	12.84	8.79
ESR 11	35.52	13.53	9.35	26.66	12.97	8.86
ESR 12	26.68	12.20	8.40	20.13	11.58	7.88
ESR 13	34.97	12.72	8.71	25.93	12.21	8.24
ESR 14	23.91	12.24	8.40	17.24	11.47	7.82
ESR 15	26.94	12.17	8.38	20.32	11.54	7.87
ESR 16	23.93	13.05	9.04	19.55	12.52	8.59
ESR 17	18.39	12.37	8.55	14.81	11.78	8.08
ESR 18	13.99	12.02	8.35	11.34	11.31	7.81
ESR 19	24.85	12.93	8.87	20.15	12.55	8.50
ESR 20	12.17	10.74	7.04	9.34	10.03	6.51
ESR 21	11.65	10.70	7.01	9.07	9.99	6.48
ESR 22	22.76	12.46	8.62	17.01	11.80	8.10
ESR 23	20.14	12.47	8.61	14.84	11.76	8.06

NO_2 concentrations obtained by inputting predicted NO_x concentrations into the NO_x to NO_2 calculator[8] in accordance with LAQM.TG(22)

4.3.2 The results show that all predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations are below the

[8] Defra Local Air Quality Management webpages (http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html)

relevant objectives and limit values in the 2019 base year and the 2025 opening future year, without the proposed development in place.

5 IMPACT ASSESSMENT

5.1 Construction Phase Assessment

Step 2 – Impact Assessment

5.1.1 In accordance with the IAQM guidance, the main activities to be considered during the construction phase of the proposed development are demolition, earthworks, construction and trackout.

5.1.2 There are no demolition activities proposed within the development site. Therefore, demolition activities are not considered further within this assessment.

5.1.3 Earthworks covers the processes of soil-stripping, ground-levelling, excavation and landscaping. Construction activities will focus on the proposed buildings, access roads car parking areas. Trackout is defined as the transport of dust and dirt by vehicles travelling from a construction site on to the public road network. This may occur through the spillage of dusty materials onto road surfaces or through the transportation of dirt by vehicles that have travelled over muddy ground on the site. This dust and dirt can then be deposited and re-suspended by other vehicles.

Step 2A

5.1.4 Step 2A of the assessment defines the potential dust emission magnitude from earthworks, construction and trackout in the absence of site-specific mitigation.

5.1.5 Examples of the criteria for the dust emission classes are detailed in **Appendix B**. The results of this step are detailed in Table 8.

Step 2B

5.1.6 Step 2B of the construction phase dust assessment defines the sensitivity of the area, taking into account the significance criteria detailed in **Appendix B**, for earthworks, construction and trackout. The sensitivity of the area to each activity is assessed for potential dust soiling, human health effects and ecological effects.

5.1.7 For earthworks and construction, there are currently between 10 and 100 receptors (residential) within 20m of where these activities may take place, which is assumed to be the site boundary for the purposes of this assessment.

5.1.8 The routing of construction vehicles is unknown at this stage. Therefore, for the purposes of this assessment, worst case routing scenarios have been assumed for assessment of potential trackout impacts at nearby receptors.

5.1.9 As a result, for trackout, there are between 10 and 100 receptors (mainly residential) within 20m of where trackout may occur for a distance of up to 500m from the site entrance.

Step 2C

5.1.10 Step 2C of the construction phase dust assessment defines the risk of impacts from each activity, by combining the dust emission magnitude with the sensitivity of the surrounding area.

5.1.11 The risk of dust impacts from each activity, with no mitigation in place, has been assessed in accordance with the criteria detailed in **Appendix B**. The results of this step are detailed in Table 7.

Summary of Step 2

5.1.12 Table 7 details the results of Step 2 of the construction phase assessment for human receptors.

Table 7: Construction Phase Dust Assessment for Human Receptors

	Activity			
	Demolition	**Earthworks**	**Construction**	**Trackout**
Step 2A				
Dust Emission Magnitude	N/A	Medium[a]	Medium[b]	Small[c]
Step 2B				
Sensitivity of Closest Receptors	N/A	High	High	High
Sensitivity of Area to Dust Soiling Effects	N/A	High	High	High
Sensitivity of Area to Human Health Effects	N/A	Low[d]	Low[d]	Low[d]
Step 2C				
Dust Risk: Dust Soiling	N/A	Medium Risk	Medium Risk	Low Risk
Dust Risk: Human Health	N/A	Low Risk	Low Risk	Negligible

a. Total site area estimated to be between 2,500m^2 and 10,000m^2
b. Total building volume estimated to be between 25,000m^3 and 100,000m^3, with potentially dusty construction materials
c. Number of construction phase vehicles estimated to be less than 10 movements per day
d. Background annual mean PM_{10} concentration is taken from the LAQM Defra default concentration maps, for the appropriate grid square for 2022

Step 3 – Mitigation

5.1.13 During the construction phase, the implementation of effective mitigation measures will substantially reduce the potential for nuisance dust and particulate matter to be generated.

5.1.14 Step 2C of the assessment has identified that the risk of dust soiling and human health effects is not negligible for all the activities and therefore site-specific mitigation will need to be implemented to ensure dust effects from these activities will be not significant.

Recommendations for Site-Specific Mitigation

5.1.15 Specific mitigation relating to dust control may be in the form of construction best practices or could include a dust management plan.

5.1.16 Recommendations for mitigation within the IAQM guidance include:

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Protection of surfaces and exposed material from winds until disturbed areas are sealed and stable;
- Dampening down of exposed stored materials, which will be stored as far from sensitive receptors as possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Avoidance of activities that generate large amounts of dust during windy conditions;
- 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;
- Avoid dry sweeping of large areas;
- 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 to be in use continuously;
- Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport;

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Minimisation of vehicle movements and limitation of vehicle speeds – the slower the vehicle speeds, the lower the dust generation;
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever the site size and layout permits; and
- Access gates to be located at least 10m from receptors, where possible.

5.1.17 All dust and air quality complaints should be recorded and appropriate measures be taken to identify causes and reduce emissions in a timely manner. Exceptional incidents which cause dust and/or emissions, and the action taken to resolve the situation, should be recorded in a logbook and made available to KC on request.

5.1.18 It is recognised that the final design solutions will be developed with the input of the Contractor to maximise construction efficiencies, to use modern construction techniques and sustainable materials and to incorporate the particular skills and experience offered by the appointed contractor.

Step 4 – Residual Effects

5.1.19 Step 4 of the construction phase dust assessment has been undertaken to determine the significance of the dust effects arising from earthworks, construction and trackout associated with the proposed development.

5.1.20 The implementation of effective mitigation measures during the construction phase, such as those detailed in Step 3, will substantially reduce the potential for nuisance dust and particulate matter to be generated and any residual impact should be **not significant**.

5.2 Operational Phase Assessment

Existing Sensitive Human Receptors

5.2.1 The impact assessment has been carried out for the representative existing sensitive receptors considered (i.e., ESR 1 to ESR 23).

5.2.2 Table 8 details the predicted NO_2 concentrations for the 2025 Opening/Future Year, for both the 'Without Development' and 'With Development' scenarios, in accordance with Defra guidance (i.e., using EFT v11.0). The impact has been assessed in accordance with the descriptors included in **Appendix C**.

Table 8: Predicted Adjusted NO_2 Concentrations at Existing Sensitive Receptors for Scenarios 2 and 3 – Using the Emission Factor Toolkit v11.0

Receptor	Calculated Annual Mean NO_2 Concentrations (µg/m^3)[a]				
	Without Development	With Development		Concentration Change as Percentage of AQAL	Impact[b]
		Concentration	Percentage in Relation to AQAL		
ESR 1	14.47	15.02	<75%	1%	**Negligible**
ESR 2	15.30	16.08	<75%	2-5%	**Negligible**
ESR 3	10.71	11.04	<75%	1%	**Negligible**
ESR 4	16.74	17.07	<75%	1%	**Negligible**
ESR 5	20.68	20.88	<75%	<0.5%	**Negligible**
ESR 6	21.75	21.88	<75%	<0.5%	**Negligible**
ESR 7	13.91	13.93	<75%	<0.5%	**Negligible**
ESR 8	14.90	14.92	<75%	<0.5%	**Negligible**
ESR 9	23.65	23.67	<75%	<0.5%	**Negligible**
ESR 10	25.64	25.67	<75%	<0.5%	**Negligible**
ESR 11	26.66	26.66	<75%	<0.5%	**Negligible**
ESR 12	20.13	20.14	<75%	<0.5%	**Negligible**
ESR 13	25.93	25.94	<75%	<0.5%	**Negligible**
ESR 14	17.24	17.24	<75%	<0.5%	**Negligible**
ESR 15	20.32	20.33	<75%	<0.5%	**Negligible**
ESR 16	19.55	19.57	<75%	<0.5%	**Negligible**
ESR 17	14.81	15.12	<75%	1%	**Negligible**
ESR 18	11.34	11.37	<75%	<0.5%	**Negligible**
ESR 19	20.15	20.26	<75%	<0.5%	**Negligible**
ESR 20	9.34	9.37	<75%	<0.5%	**Negligible**
ESR 21	9.07	9.09	<75%	<0.5%	**Negligible**
ESR 22	17.01	17.11	<75%	<0.5%	**Negligible**
ESR 23	14.84	14.89	<75%	<0.5%	**Negligible**

a. NO_2 concentrations obtained by inputting predicted NO_x concentrations into the NO_x to NO_2 calculator, in accordance with LAQM.TG(22)

b. Assessed using the Impact Descriptors from the EPUK/IAQM guidance, included in Appendix C. Changes of less than 0.5% should be described as negligible

5.2.3 Table 9 details the PM_{10} concentrations for the 2025 Opening/Future Year, for both the 'Without Development' and 'With Development' scenarios. The impact has been assessed in accordance with the descriptors included in **Appendix C**.

Table 9: Predicted Unadjusted PM_{10} Concentrations at Existing Sensitive Receptors for Scenarios 2 and 3 – Using the Emission Factor Toolkit v11.0

Receptor	Calculated Annual Mean PM_{10} Concentrations (µg/m^3)				
	Without Development	With Development		Concentration Change as Percentage of AQAL	Impact[a]
		Concentration	Percentage in Relation to AQAL		
ESR 1	11.73	11.79	<75%	<0.5%	**Negligible**
ESR 2	11.84	11.93	<75%	<0.5%	**Negligible**
ESR 3	11.22	11.26	<75%	<0.5%	**Negligible**
ESR 4	12.05	12.09	<75%	<0.5%	**Negligible**
ESR 5	12.13	12.15	<75%	<0.5%	**Negligible**
ESR 6	12.24	12.25	<75%	<0.5%	**Negligible**
ESR 7	11.68	11.69	<75%	<0.5%	**Negligible**
ESR 8	11.83	11.83	<75%	<0.5%	**Negligible**
ESR 9	12.63	12.63	<75%	<0.5%	**Negligible**
ESR 10	12.84	12.85	<75%	<0.5%	**Negligible**
ESR 11	12.97	12.97	<75%	<0.5%	**Negligible**
ESR 12	11.58	11.58	<75%	<0.5%	**Negligible**
ESR 13	12.21	12.21	<75%	<0.5%	**Negligible**
ESR 14	11.47	11.47	<75%	<0.5%	**Negligible**
ESR 15	11.54	11.54	<75%	<0.5%	**Negligible**
ESR 16	12.52	12.52	<75%	<0.5%	**Negligible**
ESR 17	11.78	11.82	<75%	<0.5%	**Negligible**
ESR 18	11.31	11.31	<75%	<0.5%	**Negligible**
ESR 19	12.55	12.57	<75%	<0.5%	**Negligible**
ESR 20	10.03	10.03	<75%	<0.5%	**Negligible**
ESR 21	9.99	9.99	<75%	<0.5%	**Negligible**
ESR 22	11.80	11.81	<75%	<0.5%	**Negligible**

Table 9: Predicted Unadjusted PM_{10} Concentrations at Existing Sensitive Receptors for Scenarios 2 and 3 – Using the Emission Factor Toolkit v11.0					
Receptor	Calculated Annual Mean PM_{10} Concentrations (µg/m³)				
	Without Development	With Development		Concentration Change as Percentage of AQAL	Impact[a]
		Concentration	Percentage in Relation to AQAL		
ESR 23	11.76	11.77	<75%	<0.5%	**Negligible**
a. Assessed using the Impact Descriptors from the EPUK/IAQM guidance, included in Appendix C. Changes of less than 0.5% should be described as negligible					

5.2.4 Table 10 details the $PM_{2.5}$ concentrations for the 2025 Opening/Future Year, for both the 'Without Development' and 'With Development' scenarios. The impact has been assessed in accordance with the descriptors included in **Appendix C**.

Table 10: Predicted Unadjusted $PM_{2.5}$ Concentrations at Existing Sensitive Receptors for Scenarios 2 and 3 – Using the Emission Factor Toolkit v11.0					
Receptor	Calculated Annual Mean $PM_{2.5}$ Concentrations (µg/m³)				
	Without Development	With Development		Concentration Change as Percentage of AQAL	Impact[a]
		Concentration	Percentage in Relation to AQAL		
ESR 1	8.05	8.08	<75%	<0.5%	**Negligible**
ESR 2	8.11	8.16	<75%	<0.5%	**Negligible**
ESR 3	7.76	7.79	<75%	<0.5%	**Negligible**
ESR 4	8.22	8.25	<75%	<0.5%	**Negligible**
ESR 5	8.28	8.29	<75%	<0.5%	**Negligible**
ESR 6	8.34	8.35	<75%	<0.5%	**Negligible**
ESR 7	8.02	8.02	<75%	<0.5%	**Negligible**
ESR 8	8.10	8.10	<75%	<0.5%	**Negligible**
ESR 9	8.66	8.67	<75%	<0.5%	**Negligible**
ESR 10	8.79	8.79	<75%	<0.5%	**Negligible**
ESR 11	8.86	8.86	<75%	<0.5%	**Negligible**
ESR 12	7.88	7.88	<75%	<0.5%	**Negligible**
ESR 13	8.24	8.24	<75%	<0.5%	**Negligible**

Table 10: Predicted Unadjusted $PM_{2.5}$ Concentrations at Existing Sensitive Receptors for Scenarios 2 and 3 – Using the Emission Factor Toolkit v11.0

Receptor	Calculated Annual Mean $PM_{2.5}$ Concentrations (µg/m³)				
	Without Development	With Development		Concentration Change as Percentage of AQAL	Impact[a]
		Concentration	Percentage in Relation to AQAL		
ESR 14	7.82	7.82	<75%	<0.5%	**Negligible**
ESR 15	7.87	7.87	<75%	<0.5%	**Negligible**
ESR 16	8.59	8.59	<75%	<0.5%	**Negligible**
ESR 17	8.08	8.10	<75%	<0.5%	**Negligible**
ESR 18	7.81	7.81	<75%	<0.5%	**Negligible**
ESR 19	8.50	8.51	<75%	<0.5%	**Negligible**
ESR 20	6.51	6.51	<75%	<0.5%	**Negligible**
ESR 21	6.48	6.48	<75%	<0.5%	**Negligible**
ESR 22	8.10	8.10	<75%	<0.5%	**Negligible**
ESR 23	8.06	8.07	<75%	<0.5%	**Negligible**

a. Assessed using the Impact Descriptors from the EPUK/IAQM guidance, included in Appendix C. Changes of less than 0.5% should be described as negligible

5.2.5 The results of the assessment show that all predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations, in the 2025 scenarios, are below the relevant objectives and limit values.

Consideration of Air Quality Impacts within the Kirklees AQMA 9

5.2.6 The nearest AQMA to the site is the Kirklees AQMA 9, approximately 1.8km north east of the proposed development.

5.2.7 Detailed traffic data was not available for roads within the AQMA 9. However, consultation undertaken with Bryan G Hall indicates that vehicle movements generated by the proposed development that would travel through the Kirklees AQMA 9 is approximately 4 AADT.

5.2.8 The air quality impacts associated with an increase of such a low number of vehicle movements will be negligible. As a result, the air quality impacts associated with

vehicles generated by the proposed development that will travel through the AQMA 9, will be not significant, in accordance with IAQM guidance.

Assessment of Significance for Human Receptors

5.2.9 The significance of the overall effects of the proposed development has been assessed in accordance with the EPUK/IAQM guidance. This assessment is based on professional judgement and details of the assessor's experience is included in **Appendix D**.

5.2.10 The assessment of significance has taken into account a number of factors, including:

- Baseline pollutant concentrations in 2019 and 2025 are below the relevant annual mean objectives and limit values at all existing receptors considered;
- NO_2, PM_{10} and $PM_{2.5}$ concentrations in 2025 with the proposed development (and committed developments) in place, are below the relevant annual mean objectives and limit values at all of the twenty-three existing sensitive receptors considered;
- The assessment predicts a negligible impact on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at all twenty-three existing sensitive receptors considered, with the development (and committed developments) in place; and
- The number of vehicles travelling through the AQMA 9 is 4 AADT. The air quality impacts associated with an increase of such a low number of vehicle movements will be negligible.

5.2.11 Based on the above factors, in accordance with the EPUK/IAQM guidance, the air quality effect of the proposed development is considered to be **not significant**.

Recommendations for Mitigation

5.2.12 The impact of the proposed development is predicted to be not significant for human receptors. In accordance with the KC Air Quality & Emissions Technical Planning Guidance (part of West Yorkshire Low Emissions Strategy), the development is classed as 'medium' and therefore an emissions mitigation assessment is not required.

5.2.13 In accordance with the guidance, the proposals will be accompanied by a detailed Travel Plan.

5.2.14 However, additional mitigation measures will assist in reducing any potential impact and general best practice measures in relation to air quality could be implemented. It

is understood that the proposed development will also include the provision of one EV charging point that can service two vehicles at a time (two EV parking spaces).

6 CONCLUSIONS

6.1 Construction Phase

6.1.1 The construction phase assessment has been undertaken to determine the risk and significance of dust and fine particulate matter effects from earthworks, construction and trackout associated with the proposed development, in accordance with guidance published by the IAQM.

6.1.2 With site specific mitigation measures in place, the significance of dust and fine particulate effects from earthworks, construction and trackout is considered to be **not significant**.

6.2 Operational Phase

Existing Sensitive Receptors

6.2.1 An air quality assessment has been undertaken to consider the potential impact of development generated vehicles on air quality at twenty-three existing sensitive human receptors.

6.2.2 The assessment has been undertaken in accordance with Defra guidance, by using the latest vehicle emission factors from EFT v11.0.

6.2.3 Pollutant concentrations in 2025, with the development in place, are below the relevant annual mean objectives and limit values at the receptors considered.

6.2.4 The assessment predicts that the development will have a negligible impact on concentrations of NO_2, PM_{10} and $PM_{2.5}$ at all twenty-three existing sensitive receptors considered in 2025. The effect of the proposed development on human receptors is therefore considered to be **not significant.**

6.3 Summary

6.3.1 The assessment demonstrates that the proposed development will not lead to an unacceptable risk from air pollution, nor will it lead to any breach of national objectives as required by national policy. The proposed development is, therefore, in accordance with relevant national policy. There are no material reasons in relation to air quality why the proposed scheme should not proceed.

APPENDICES

Appendix A: Air Quality Legislation and Guidance

National Air Quality Strategy

A.1 The Environment Act, introduced in 1995 and recently amended in 2021, requires the UK government to prepare a national Air Quality Strategy. The first UK strategy was published in March 1997, setting out policies for the management of ambient air quality. This was subsequently updated in 2007[1].

A.2 The 2007 strategy establishes the framework for air quality management in England, Scotland, Wales and Northern Ireland. Air quality standards and objectives are set out for eight pollutants which may potentially occur at levels that give cause for concern. The strategy also provides details of the role that local authorities are required to take in working towards improvements in air quality, known as the Local Air Quality Management (LAQM) regime.

Air Quality Standards and Objectives

A.3 Air quality standards and objectives are set out in the strategy for the following pollutants: nitrogen dioxide (NO_2), sulphur dioxide (SO_2), carbon monoxide (CO), lead (Pb), fine particulate matter (PM_{10}), benzene (C_6H_6), 1, 3–butadiene (C_4H_6) and ozone (O_3).

A.4 Objectives for each pollutant, except O_3, were first given statutory status in the Air Quality Regulations 2000[2] and Air Quality (Amendment) Regulations 2002[3]. These objectives are defined in the strategy as:

"the maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, within a specified timescale."

A.5 EU limit values, set out within the Ambient Air Quality Directive 2008/50/EC[4] (i.e. the CAFE Directive), were transposed into UK legislation on 11th June 2011 as The Air Quality Standards Regulations 2010. These are mostly the same as the air quality objectives in terms of concentrations; however, there are differences in determining how compliance is achieved. Although the UK is no longer part of the EU, no changes

[1] Department of Environment, Food and Rural Affairs, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. July 2007
[2] The Air Quality Regulations 2000. SI No 928
[3] The Air Quality (Amendment) Regulations 2002
[4] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

have yet been made to the objectives and limit values used in the management and assessment of air quality.

A.6 Whilst there is no specific objective for $PM_{2.5}$ in England and Wales, a limit value of 20µg/m^3 is referred to in the regulations, which has been adopted for use in this assessment (as recommended by the LAQM Helpdesk). An objective has been set for $PM_{2.5}$ in Scotland since early 2016. The Environment Act 2021 sets out a requirement to establish a target objective for $PM_{2.5}$, however it is not known what this objective will be or when it will come in to force.

A.7 Examples of where these objectives and limit values apply are detailed in the Defra LAQM Technical Guidance document LAQM.TG(22)[5] and are included in Table A1.

Table A1: Examples of Where the Air Quality Objectives Should Apply

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes, etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens of residential properties[a]	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour objectives apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations to which the public might reasonably be expected to spend one hour or longer	Kerbside sites where public would not be expected to have regular access

[5] Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance LAQM.TG(22), August 2022

Table A1: Examples of Where the Air Quality Objectives Should Apply		
Averaging Period	**Objectives Should Apply at:**	**Objectives Should Generally Not Apply at:**
15-minute mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer	
[a] *Such locations should represent parts of the garden where relevant public exposure is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied*		

Local Air Quality Management

A.8 LAQM legislation in the Environment Act 2021 requires local authorities to conduct the periodic review and assessments of air quality. These aim to identify all those areas where the objectives are being, or are likely to be, exceeded. Where exceedances are likely to occur, local authorities are required to declare an Air Quality Management Area (AQMA).

A.9 LAQM.TG(22) presents a streamlined approach for LAQM in England and Scotland; however, Northern Ireland is still considering changes to LAQM and therefore works according to the previous regime.

A.10 The Welsh Government amended the LAQM regime in Wales in 2017 by issuing new statutory policy guidance in order to bring the system into line with the Well-being of Future Generations (Wales) Act 2015[6]. This aims to achieve compliance with the national air quality objectives in specific hotspots and to reduce exposure to pollution more widely, so as to achieve the greatest public health benefit.

A.11 Local authorities in England are required to produce Annual Status Reports (ASRs), and in Scotland and Wales, Annual Progress Reports (APRs). These replace all other reports which previously had to be submitted including Updating and Screening Assessments, Progress Reports and Detailed Assessments (which would be produced to assist with an AQMA declaration).

A.12 Local authorities now have the option of a fast track AQMA declaration option. This allows more expert judgement to be used and removes the need for a Detailed Assessment where a local authority is confident of the outcome. Detailed Assessments should however still be used if there is any doubt.

[6] Well-being of Future Generations (Wales) Act 2015 (anaw 2)

A.13 As part of the UK Government's requirement to improve air quality, selected local authorities in England are also currently investigating the feasibility of setting up Clean Air Zones (CAZs). These are areas where targeted action and co-ordinated resources aim to improve air quality within an urban setting, in order to achieve compliance with the EU limit values within the shortest possible time.

A.14 The first CAZs were implemented in Bath in March 2021, and in Birmingham in June 2021. In addition, the London Ultra Low Emission Zone (ULEZ) was expanded to incorporate the North and South Circular roads in October 2021. The Bristol CAZ became live in November 2022. The Newcastle-upon-Tyne and Gateshead CAZ became live in January 2023. The Sheffield CAZ became live in February 2023. Charges apply to certain types of vehicles travelling within these areas, including buses, coaches, taxis, private hire vehicles and heavy-duty vehicles (HDVs). The Newcastle-upon-Tyne and Gateshead CAZ has a temporary exemption, until July 2023, for light goods vehicles. The Sheffield CAZ has a temporary exemption, until June 2023, for light goods vehicles used by individuals and businesses based in Sheffield of Rotherham, by application only. The Greater Manchester CAZ, due to be introduced from 30 May 2022, has been delayed and is currently under review.

National Planning Policy Framework

A.15 The National Planning Policy Framework (NPPF)[7], introduced in March 2012 and most recently updated in July 2021, requires that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of AQMAs and CAZs, 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 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 AQMAs and CAZs is consistent with the local air quality action plan."

[7] Ministry of Housing, Communities and Local Government, National Planning Policy Framework, February 2019

Planning Practice Guidance

A.16 The Planning Practice Guidance (PPG)[8], published in March 2014 and last updated in November 2019, states that whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate 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).

A.17 Where a proposed development is anticipated to give rise to concerns about air quality, an appropriate assessment needs to be carried out. Where the assessment concludes that the proposed development (including mitigation) will not lead to an unacceptable risk from air pollution, prevent sustained compliance with national objectives or fail to comply with the requirements of the Habitats Regulations, then the local authority should proceed to decision with appropriate planning conditions and/or obligations.

[8] Department for Communities and Local Government. Planning Practice Guidance: Air Quality, November 2019

Appendix B: Methodology for Construction Phase Assessment

Institute of Air Quality Management Guidance

B.1 The methodology for the construction phase dust assessment is set out in guidance from the Institute of Air Quality Management (IAQM)[9].

Step 1

B.2 Step 1 is to screen the requirement for a more detailed assessment. The guidance states that an assessment will normally be required where there are existing sensitive human receptors within 350m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

B.3 With regards to ecological receptors, the guidance states that an assessment will normally be required where there are existing receptors within 50m of the site boundary and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

B.4 Where any of these criteria are met, it is necessary to proceed to Step 2.

Step 2

B.5 Step 2 determines the potential risk of dust arising in sufficient quantities to cause annoyance and/or health or ecological impacts. The risk is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc);
- The duration of these activities;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activity;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of receptors to dust.

B.6 The risk of dust impacts is determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based upon the following two factors (known as Step 2A and Step 2B).

[9] Institute of Air Quality Management, Guidance on the Assessment of Dust from Demolition and Construction, February 2014

B.7 **Step 2A** assesses the scale and nature of the works which determines the potential dust emission magnitude as small, medium or large. Examples of how the magnitude may be defined are included in Table B1.

Table B1: Determining the Dust Emission Magnitude of Construction Phase Activities

Activity	Dust Emission Class		
	Large	Medium	Small
Demolition	Total building volume >50,000m^3; Potentially dusty construction material (e.g. concrete); On-site crushing and screening; Demolition activities >20m above ground level	Total building volume 20,000-50,000m^3; Potentially dusty construction material; Demolition activities 10-20m above ground level	Total building volume <20,000m^3; Construction material with low potential for dust release (e.g. metal cladding or timber)
Earthworks	Total site area >10,000m^2; Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size); >10 heavy earth moving vehicles active at any one time; Formation of bunds >8m in height; Total material moved >100,000 tonnes	Total site area 2,500-10,000m^2; Moderately dusty soil type (e.g. silt); 5-10 heavy earth moving vehicles active at any one time; Formation of bunds 4-8m in height; Total material moved 20,000-100,000 tonnes	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 <20,000 tonnes; Earthworks during wetter months
Construction	Total building volume >100,000m^3; On-site concrete batching; Sandblasting	Total building volume 25,000-100,000m^3; Potentially dusty construction material (e.g. concrete); On-site batching	Total building volume <25,000m^3; Construction material with a low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HDV (>3.5t) outward movements[a] in any one day[b]; Potentially dusty surface material (e.g. high clay content); Unpaved road length >100m	10-50 HDV (>3,5t) outward movements[a] in any one day[b]; Moderately dusty surface material (e.g. high clay content); Unpaved road length 50-100m	<10 HDV (>3.5t) outward movements[a] in any one day[b]; Surface material with low potential for dust release; Unpaved road length <50m

a. A vehicle movement is a one way journey i.e. from A to B, and excludes the return journey
b. HDV movements during a construction project may vary over its lifetime, and the number of movements is the maximum not the average

B.8 **Step 2B** considers the sensitivity of the area to dust impacts which is defined as low, medium or high. The sensitivity categories for different types of receptors are described in Table B2.

Table B2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects

Sensitivity Category	Dust Soiling Effects	Health effects of PM_{10}	Ecological Effects
High	Users can reasonably expect to enjoy a high level of amenity; Appearance, aesthetics or value of a property would be diminished; Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car show rooms	Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM_{10}; Examples include residential properties, hospitals, schools, and residential care homes	Locations with an international or national designation and the designated features may be affected by dust soiling; Locations where there is a community of a particularly dust sensitive species; Examples include a Special Area of Conservation with dust sensitive features
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; People or property wouldn't reasonably be expected to be continuously present or regularly for extended periods of time; Examples include parks and places of work	Locations where people are exposed as workers and exposure is over a period of time relevant to the air quality objective for PM_{10}; Examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}	Locations 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; Examples include a Site of Special Scientific Interest with dust sensitive features
Low	Enjoyment of amenity would not reasonably be expected; Property would not be diminished in appearance, aesthetics or value; People or property would be expected to be present only for limited periods of time;	Locations where human exposure is transient; Examples include public footpaths, playing fields, parks and shopping streets	Locations with a local designation where the features may be affected by dust deposition; Examples include a Local Nature Reserve with dust sensitive features

Table B2: Sensitivity Categories for Dust Soiling, Human Health and Ecological Effects			
Sensitivity Category	**Dust Soiling Effects**	**Health effects of PM_{10}**	**Ecological Effects**
	Examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads		

B.9 Based on the sensitivity of individual receptors, the overall sensitivity of the area to dust soiling, human health and ecological effects is then determined using the criteria detailed in Tables B3 to B5, respectively.

Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property[ab]					
Receptor Sensitivity	**Number of Receptors**	**Distance from Source (m)[c]**			
		<20m	**<50m**	**<100m**	**<350m**
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

a. The sensitivity to the area should be derived for each of the four activities
b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered
c. For trackout, distances should be measured from the side of the roads used by construction traffic. Without site specific mitigation, trackout may occur for up to 500m from large sites, 200m from medium sites and 50m from small sites, measured from the site exit. The impact declines with distance from the site and it is only necessary to consider trackout impacts up to 50m from the edge of the road

Table B4: Sensitivity of the Area to Human Health Impacts[ab]							
Receptor Sensitivity	**Annual Mean PM_{10} Concentration[c]**	**Number of Receptors[d]**	**Distance from Source (m)[e]**				
			<20m	**<50m**	**<100m**	**<200m**	**<350m**
High	>32µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low

Table B4: Sensitivity of the Area to Human Health Impacts[ab]							
Receptor Sensitivity	**Annual Mean PM_{10} Concentration[c]**	**Number of Receptors[d]**	**Distance from Source (m)[e]**				
			<20m	**<50m**	**<100m**	**<200m**	**<350m**
	28-32µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

a. *The sensitivity to the area should be derived for each of the four activities*
b. Estimate the total number of receptors within the stated distance. Only the highest level of sensitivity from the table needs to be considered
c. Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32µg/m^3 being the annual mean concentration at which an exceedance of the 24-hour mean objective is likely in England, Wales and Northern Ireland. In Scotland, there is an annual mean objective of 18µg/m^3
d. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties
e. For trackout, distances should be measured from the side of the roads used by construction traffic

Table B5: Sensitivity of the Area to Ecological Impacts[ab]		
Receptor Sensitivity	**Distance from the Source (m)[c]**	
	<20	**<50**
High	High	Medium
Medium	Medium	Low
Low	Low	Low

a. *The sensitivity to the area should be derived for each of the four activities*
b. Only the highest level of sensitivity from the table needs to be considered
c. For trackout, distances should be measured from the side of the roads used by construction traffic

B.10 These two factors are combined in **Step 2C** to determine the risk of dust impacts with no mitigation applied.

B.11 The risk of dust effects is determined for four types of construction phase activities, with each activity being considered separately. If a construction phase activity is not taking place on the site, then it does not need to be assessed. The four types of activities to be considered are:

- Demolition;
- Earthworks;
- Construction; and
- Track-out.

B.12 The risk of dust being generated by demolition activities at the site is determined using the criteria in Table B6.

Table B6: Risk of Dust Impacts for Demolition			
Sensitivity of Area	**Dust Emission Magnitude**		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

B.13 The risk of dust being generated by earthworks and construction at the site is determined using the criteria in Table B7.

Table B7: Risk of Dust Impacts for Earthworks and Construction			
Sensitivity of Area	**Dust Emission Magnitude**		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

B.14 The risk of dust being generated by track-out at the site is determined using the criteria in Table B8.

Table B8: Risk of Dust Impacts for Track-out			
Sensitivity of Area	**Dust Emission Magnitude**		
	Large	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3

B.15 Step 3 of the assessment determines the site-specific mitigation required for each of the activities, based on the risk determined in Step 2. Mitigation measures are detailed in guidance published by the Greater London Authority[10], recommended for use outside the capital by LAQM guidance, and the IAQM guidance document itself. Professional judgement should be used to determine the type and scale of mitigation measures required.

B.16 If the risk is classed as negligible, no mitigation measures beyond those required by legislation will be necessary.

Step 4

B.17 Step 4 assesses the residual effect, with mitigation measures in place, to determine whether or not these are significant.

[11] Greater London Authority, The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, 2006

Professional Judgement

B.18 The IAQM guidance makes reference to the use of professional judgement when assessing the risks of dust and fine particulate matter from demolition and construction sites. Details of the experience of the personnel involved with the project are provided in **Appendix D**.

Appendix C: Methodology for Operational Phase Assessment

Air Dispersion Modelling Inputs

C.1 The air dispersion model ADMS-Roads (CERC, Version 5.0.1) has been used to assess the potential air quality impacts associated with development-generated road traffic emissions. This dispersion model is widely used and accepted for the purpose of undertaking assessments to support both planning and Environmental Permit applications.

Traffic Flow Data

C.2 The ADMS-Roads model requires the input of detailed road traffic flow data for those routes which may be affected by the proposed development. Traffic flow data has been obtained for this project by Bryan G Hall, the appointed transport consultants for the project. The study extent of the model is shown in Figure C.1.

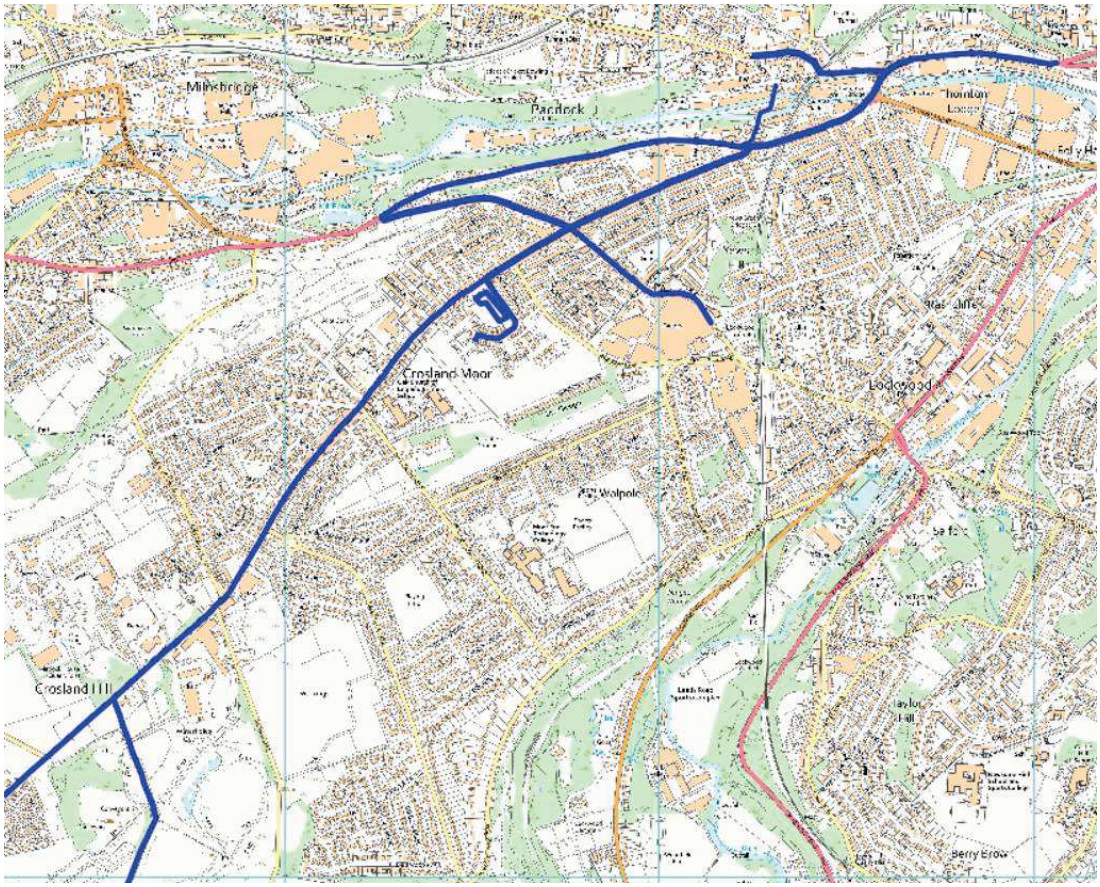


Figure C.1: Study Extent of Air Dispersion Model. The roads modelled in the assessment can be seen in blue (‘*Reproduced from Ordnance Survey Maps © Crown Copyright All Rights Reserved Licence No. 0100031673’)*

C.3 Data has been provided as 24-hour Annual Average Daily Traffic (AADT) flows, with HGV percentages. No average speed information was available and therefore speed limits have been used, with a reduction to 15kph in locations where congestion or the slowing down of vehicles would be expected.

C.4 The traffic flow data used in the assessment is included in Table C1.

Table C1: 24-hour AADT traffic data used in the assessment										
Link Name	Scenario 1: 2019 Verification and Base Year		Scenario 2: 2025 Opening/Future Year, Without Development		Scenario 3: 2025 Opening/Future Year, With Development		Proposed Development		Committed Development	
	LGV	HGV	LGV	HGV	LGV	HGV	LGV	HGV	LGV	HGV
Turnstone Way (North)	339	18	1428	75	3531	186	2213	0	1129	0
Site Access	0	0	0	0	2213	0	2213	0	0	0
Turnstone Way (South)	339	18	1428	75	1428	75	0	0	1129	0
Blackmoorfoot Road (East)	8397	171	12847	262	13783	281	955	0	4117	0
Turnstone Way	317	20	1394	89	3474	222	2213	0	1129	0
Blackmoorfoot Road (West)	8191	167	11812	241	11946	244	136	0	3281	0
Blackmoorfoot Road (East)	5391	284	6015	317	6144	323	136	0	376	0
Sands House Lane	681	36	715	38	715	38	0	0	0	0
Blackmoorfoot Road (West)	4929	259	5530	291	5659	298	136	0	376	0
Blackmoorfoot Road (East)	5391	284	10898	574	11027	580	136	0	5515	0
Black Cats Access	0	0	5598	0	5598	0	0	0	5598	0
Blackmoorfoot Road (West)	5391	284	6015	317	6144	323	136	0	376	0
Blackmoorfoot Road (East)	7120	375	12022	633	12249	645	239	0	4789	0
Park Road	6777	357	7552	397	7552	397	0	0	463	0
Park Road West	6858	361	7415	390	7415	390	0	0	229	0
Blackmoorfoot Road (West)	8220	433	13295	700	13521	712	239	0	4913	0
A62 (East)	14149	745	19399	1021	19456	1024	60	0	4789	0
Birkhouse Lane	3481	183	3654	192	3654	192	0	0	0	0
Blackmoorfoot Road	7877	415	12817	675	12873	678	60	0	4789	0

Table C1: 24-hour AADT traffic data used in the assessment										
Link Name	Scenario 1: 2019 Verification and Base Year		Scenario 2: 2025 Opening/Future Year, Without Development		Scenario 3: 2025 Opening/Future Year, With Development		Proposed Development		Committed Development	
	LGV	HGV	LGV	HGV	LGV	HGV	LGV	HGV	LGV	HGV
A62 (West)	8915	469	9357	492	9357	492	0	0	0	0
A62 (North)	14602	769	19331	1017	19345	1018	15	0	4217	0
Waterside	248	13	260	14	260	14	0	0	0	0
St Thomas' Road	8344	439	9310	490	9310	490	0	0	582	0
A62 (South)	15340	807	20658	1087	20672	1088	15	0	4799	0
A62 (North)	10939	576	15487	815	15490	815	4	0	4217	0
Longroyd Lane	6910	364	7252	382	7252	382	0	0	0	0
A62(South)	14602	769	19331	1017	19334	1018	4	0	4217	0

C.5 The following assumptions have been made within the traffic data. This information has been provided by Bryan G Hall:

- Traffic figures have been obtained from local traffic surveys undertaken in 2021 as part of this application, and figures for the wider area have been extracted from planning documents submitted as part of the Black Cats site, this traffic data was collected in 2015.
- Both sets of data have been growthed appropriately to the 2019 base year and 2025 future year (assumed 3-years post planning submission).
- HGV percentages for links on the wider network are not reported in the Black Cats traffic figures and are therefore unknown. Therefore a default rate of 5% has been applied to all routes where no data is available.
- Peak hour traffic flows have been increased to an AADT format using factors derived from a nearby ATC Count Point on the A62 (ID 16587), as not ATC Count Points are available on the Blackmoorfoot Road corridor.
- Development AADT figures have been estimated based on the daily trip rate obtained from a TRICS output.
- Development trips have been distributed in line with the methodology set out within the Transport Assessment. For junctions beyond the scope of the TA, development trips have been successively reduced accounting for the nature of the development and nature of development trip types.

Vehicle Emission Factors

C.6 The air quality assessment has used vehicle emission factors calculated using the Emissions Factor Toolkit (EFT) version 11.0, released in November 2021. This is the most up-to-date version of the EFT currently available.

C.7 As discussed in the section 3.4 of the report, in accordance with the latest guidance from the IAQM, a sensitivity analysis has not been undertaken as model verification has been undertaken using data from later than 2016[11].

C.8 As a result, vehicle emission factors from EFT v11.0 have been used for the assessment, with the appropriate year factors applied to the modelling scenarios.

[11] Available on the Institute of Air Quality Management website (https://iaqm.co.uk/wp-content/uploads/2013/02/iaqm_uncertainty_vehicle_NOx_emission_withdrawn-02.pdf)

Street Canyons

C.9 LAQM.TG(22) states that '*street canyons can generally be defined as narrow streets where the height of buildings on both sides of the road is greater than the road width*'. The principal effects of a street canyon on the dispersion of pollution from a road source are:

- Pollution being channelled along the canyon;
- Pollution being dispersed across the canyon by circulating flow at road height;
- Pollutants being trapped in recirculation regions;
- Pollutants leaving the canyon between gaps in the buildings;
- Pollutants leaving the canyon from the canyon top; and
- Pollutants leaving the canyon from the downstream end of the canyon.

C.10 The model has included one street canyon along a section of Blackmoorfoot Road.

Meteorological Data

C.11 The meteorological data used in the air quality modelling has been obtained from ADM Limited and is from the Emley Moor 2 recording station, covering the period between 1st January and 31st December 2019. This has complete data capture for wind and temperature.

C.12 The Emley Moor 2 recording station is located approximately 10km from the proposed development and is considered to be the most representative of the conditions at the proposed development, due to its relative location and similar altitude.

C.13 The 2019 wind rose for the Emley Moor 2 Meteorological Recording Station is shown in Figure C2.

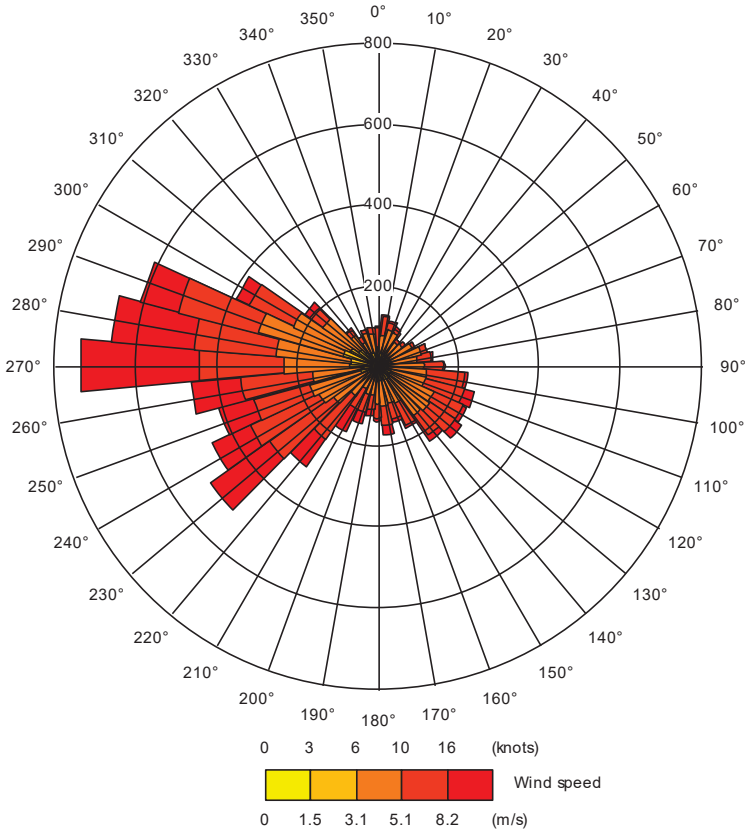


Figure C.2: 2019 Wind Rose for the Emley Moor 2 Meteorological Station

Dispersion and Meteorological Site Characteristics

C.14 The characteristics for the dispersion site and meteorological sites, included in the ADMS-Roads model, are detailed in Table C2.

Table C2: Dispersion and Meteorological Site Characteristics

Setting	Dispersion Site	Meteorological Site
Surface Roughness	1.0m	0.02m
Surface Albedo	0.23	0.23
Minimum Monin-Obukhov Length	30m	1m
Priestley-Taylor Parameter	1	1

NO_x to NO_2 Conversion

C.15 In accordance with the guidance within LAQM.TG(22), the ADMS-Roads model has been run to predict the road-contribution NO_x concentrations for each receptor location. These have then been converted to NO_2 concentrations using the Defra NO_x to NO_2 calculator[12].

Model Validation and Verification

C.16 LAQM.TG(22) refers to model validation as *"the general comparison of modelled results against monitoring data carried out by model developers"*. ADMS-Roads is widely accepted by regulatory authorities for use in this type of assessment.

C.17 Model verification is used to check the performance of the model at a local level. The verification of the ADMS-Roads air dispersion model is achieved by modelling concentration(s) at existing monitoring location(s) in the vicinity of the proposed development, and comparing the modelled concentration(s) with the measured concentration(s).

C.18 Following review of the KC 2019 monitoring data (within the 2021 ASR), it is understood there are four roadside air quality monitoring locations in close proximity to the proposed development site, with suitable data capture, and along roads for which detailed traffic data was available. (Ref: K49, 50, 76 and 77).

C.19 As no PM_{10} or $PM_{2.5}$ monitoring locations are situated along roads where traffic flow data is available, it has not been possible to carry out model verification for modelled PM_{10} or $PM_{2.5}$ concentrations.

C.20 The monitoring data that has been used in the model verification procedure is detailed in Table C3.

Table C3: NO_2 Monitoring Data Used for Verification Purposes

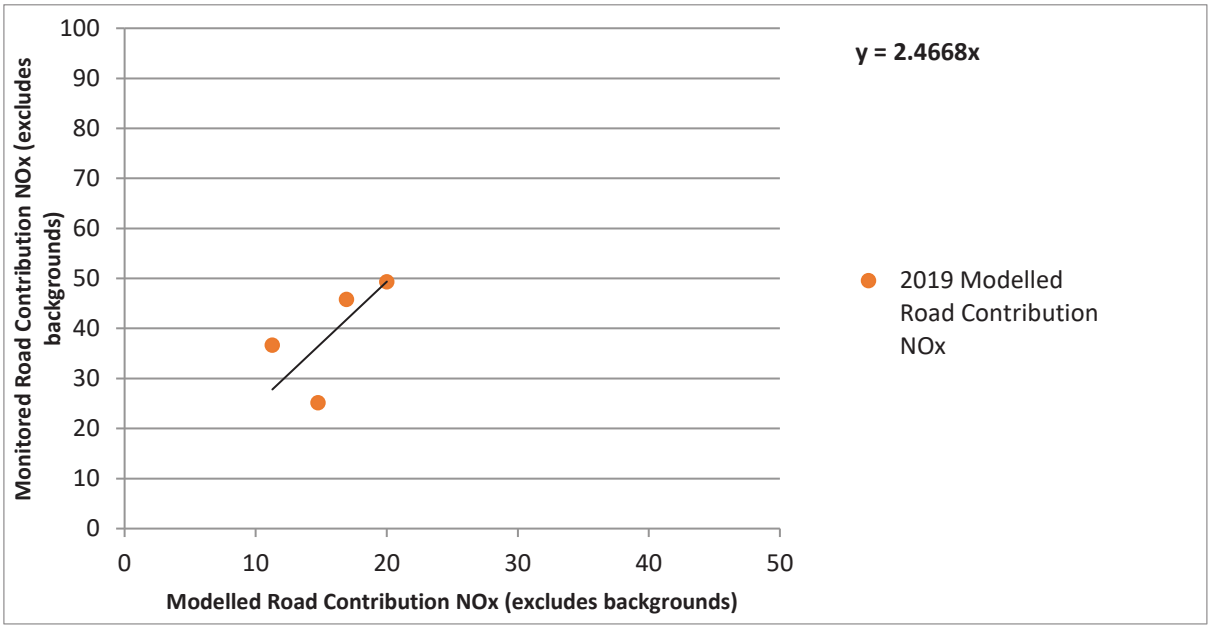
Monitoring Location Reference	Type	Approximate Grid Reference		2019 Bias Adjusted NO_2 Annual Average Concentration (µg/m³)
		Easting	Northing	
K76	Roadside Diffusion Tube	413198	415956	28.53
K77		413455	416013	38.88
K49		413658	416183	33.12

[12] Defra Local Air Quality Management web pages [http://laqm.defra.gov.uk/tools-monitoring-data/no-calculator.html]

Table C3: NO_2 Monitoring Data Used for Verification Purposes				
Monitoring Location Reference	Type	Approximate Grid Reference		2019 Bias Adjusted NO_2 Annual Average Concentration (µg/m³)
		Easting	Northing	
K50		413413	415984	38.19

C.21 The modelled road-contribution NO_x concentration for the diffusion tubes have been compared against the measured road-contribution NO_x concentrations for the same locations. The measured concentrations have been derived using the Defra NO_x to NO_2 calculator, taking into account the background NO_x concentration for the local area.

C.22 The comparison is shown in the below graph. The equation of the trend line is based on linear regression through zero, which provides an overall adjustment factor of 2.4668.



C.23 This adjustment factor has been applied to the modelled road-contribution NO_x concentrations. The total NO_2 concentrations have been derived by combining the adjusted road-contribution NO_x concentration and background NO_2 concentration, using the Defra NO_x to NO_2 calculator.

C.24 A final comparison has been made between the total measured NO_2 concentrations and total modelled NO_2 concentrations, as shown in Table C4. Following adjustment, modelled concentrations are within 10% of measured concentrations.

Table C4: Comparison Between Measured and Monitored NO_2 Concentrations			
Monitoring Location Reference	**Measured Total NO_2 Concentration ($\mu g/m^3$)**	**Modelled Total NO_2 Concentration ($\mu g/m^3$)**	**Difference (%)**
K76	28.53	33.94	18.96
K77	38.88	39.83	2.44
K49	33.12	28.95	-12.59
K50	38.19	35.54	-6.94

C.25 A Root Mean Square Error (RMSE) calculation has been undertaken as part of the model verification for NO_2 concentrations. This has been carried out for the monitoring location included within the model verification, in accordance with the guidance detailed in LAQM.TG(22).

C.26 The RMSE calculation following adjustment is detailed in Table C5.

Table C5: RMSE Calculation for Nitrogen Dioxide Concentrations				
Diffusion Tube Location	**After Verification**			
	Observed Value	**Predicted Value**	**Difference**	**RMSE**
K76	28.53	33.94	-5.41	**5.22**
K77	38.88	39.83	-0.95	
K49	33.12	28.95	4.17	
K50	38.19	35.54	2.65	

C.27 LAQM.TG(22) states that *"ideally an RMSE value within 10% of the objective would be derived"*, a value of within 25% is considered acceptable.The results of the calculation show that following model verification, the RMSE value is within 25% (i.e. 10µg/m^3) of the objective (i.e. 40µg/m^3). Therefore, the model is considered to be performing to an acceptable standard.

Assessment Criteria

Assessing the Impact of a Proposed Development on Human Receptors

C.28 Guidance has been prepared by Environmental Protection UK (EPUK) and the IAQM[13] with relation to the assessment of the air quality impacts of proposed developments

[13] Moorcroft and Barrowcliffe et al, Land-Use Planning and Development Control: Planning for Air Quality (v1.2), January 2017

and their significance.

C.29 The impact of a development is usually assessed at specific receptors, and takes into account both the long-term background concentrations, in relation to the relevant Air Quality Assessment Level (AQAL) at these receptors, and the change with the development in place.

C.30 The impact descriptors for individual receptors are detailed in Table C6.

Table C6: Impact Descriptors for Individual Receptors

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

**Percentage pollutant concentrations have been rounded to whole numbers, to make it easier to assess the impact. Changes of 0% (i.e. less than 0.5% or 0.2µg/m^3) should be described as Negligible*

Determining the Significance of Effects

C.31 Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as either 'significant' or 'not significant'.

C.32 Once the impact of the proposed development has been assessed for the individual impacts, the overall significance is determined using professional judgement. This takes into account a number of factors such as:

- The existing and future air quality in the absence of the development;
- The extent of the current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

Appendix D: Professional Experience of Assessors

D.1 The assessment of air quality impacts, and the significance of the associated effects, takes into account the professional judgement of the assessor. Details of the experience of the personnel involved with the project are provided below:

Paul Threlfall — **Principal Environmental Scientist (Air Quality & Odour)**
BSc (Hons), MSc

Paul joined Wardell Armstrong in October 2017 as an Air Quality Scientist, after completing his MSc Water, Energy and the Environment at Liverpool John Moores University. The majority of his work is carried out in support of planning applications and, therefore, he has experience of undertaking air quality assessments for a wide range of projects including residential developments, commercial developments and mixed-use developments.

Paul has a broad range of skills and knowledge of air quality modelling and monitoring through his involvement in air quality projects, both as individual commissions and as part of Environmental Impact Assessments (EIAs). Paul also has extensive knowledge and experience of undertaking odour assessments, ranging from qualitative desk-based assessments to more detailed odour dispersion modelling assessments using AERMOD, as well as extensive experience of undertaking odour 'sniff test' observations.

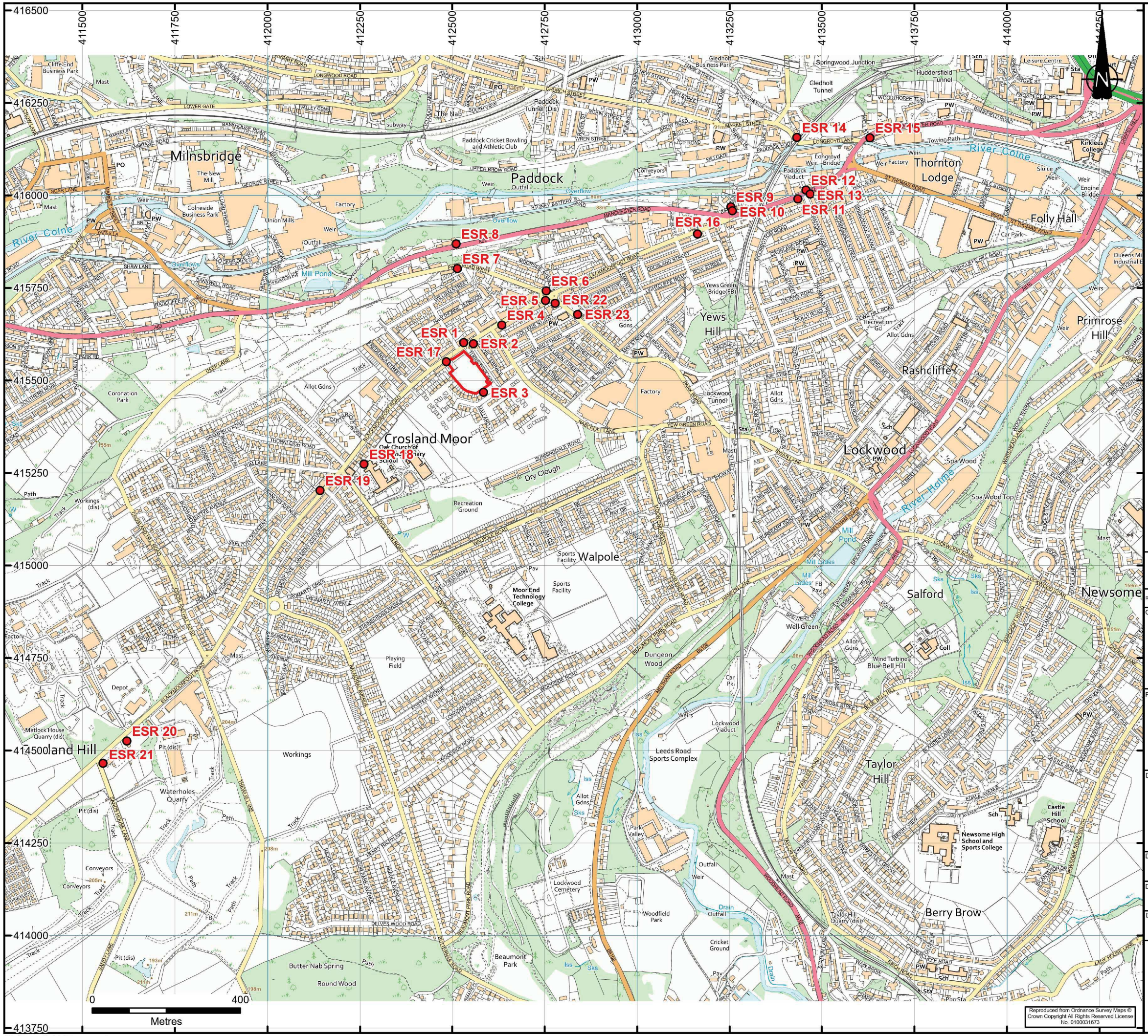
Malcolm Walton — **Technical Director**
BSc (Env Health) Dip (Acoustics & Noise Control)
MCIEH AMIOA

Malcolm holds a Bachelor of Science degree in Environmental Health and the Diploma in Acoustics and Noise Control. Malcolm is a Member of the Chartered Institute of Environmental Health and an Associate Member of the Institute of Acoustics.

Malcolm joined Wardell Armstrong in September 2001 following 12 years working

as an Environmental Health Officer in several local authorities, responsible for the enforcement of environmental legislation and, in particular, air pollution and noise nuisance. Malcolm has experience in the technical co-ordination of environmental appraisal of large schemes to UK and international standards. Malcolm regularly carries out and co-ordinates noise and air quality assessment work associated with planning applications including EIA work and PPC permit application/compliance. He also regularly acts as expert witness in planning inquiries in respect of noise, air quality and odour.

DRAWINGS



KEY

- Site Boundary
- Existing Sensitive Receptors

Notes:

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

LIDL GB LTD

PROJECT

PROPOSED LIDL FOODSTORE
CROSLAND MOOR

DRAWING TITLE

EXISTING SENSITIVE RECEPTOR LOCATIONS

DRG No.		REV
GM12449-001		A
DRG SIZE	SCALE	DATE
A3	1:10,000	11/04/2023
DRAWN BY	CHECKED BY	APPROVED BY
CT	PT	MTW

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