Land North of Borers Arms Road, Copthorne

Air Quality Assessment

November 2025

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APPENDICES

1.0 Executive Summary

This air quality technical note has been prepared by Pinnacle ESP Ltd on behalf of Fairfax Acquisitions Limited in support of a proposal for circa 260 residential dwellings, landscaping, drainage and infrastructure on a parcel of Land North of Borers Arms Road, Copthorne.

The project is also to include a small parcel of land earmarked for commercial (Class E) uses.

There is a requirements to submit an air quality assessment in order for the application to be validated, further clarified as a technical note to consider the impact on local air quality as a result of the proposed outline application for new residential development on the Land North of Borers Arms Road, Copthorne.

During the construction phase, the site has limited potential to generate dust nuisance beyond the application boundary. However, through the implementation of on site dust management practices, the impacts will be effectively removed.

Traffic generated by the proposed development has been considered with the submitted Transport Assessment prepared by SK transport.

This concludes that daily flows will actually result in an increase of private vehicle movements and residential/commercial servicing vehicles to/from the proposed development at 478 two way trips – an increase in traffic flows of circa 21.9% based on the available annual average daily traffic flow for Borers Arms Road – the most impacted corridor.
The project is not within an air quality management area (AQMA), indeed there are no AQMA's within the Tandridge area.

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Given the most recent monitoring data taken from TDC for the passive roadside monitoring location at TD39- Land North of Borers Arms Road, Copthorne – recording 18.3µg/m3 – this figure being well within the required air quality objective, it is the conclusion of this technical note is that impact of the increase in traffic generated by the proposed development will have a negligible impact on the air quality within the area, and in particular, the Land North of Borers Arms Road area near to the proposed development site, and as such there are no air quality related issues that would impact the application as presented.

2.0 Introduction

The land that is the subject of this sustainability report is a parcel of Land North of Borers Arms Road, Copthorne.

This report set out the strategic sustainability strategy in support of a proposal for circa 260 residential dwellings landscaping, drainage and infrastructure.

The location of the proposed development site is presented in Figure 1.

Fig 1. Site Location

The project sits within the borough boundaries of Tandridge District Council, although acknowledged that the access via Borers Arms Road is within Mid-Sussex District Council.

Tandridge DC

- Tandridge District Core Strategy (adopted October 2008)
- Tandridge Local Plan Part 2: Detailed Policies 2014-2029 (adopted July 2014).

The Local Plan Part 2: Detailed Policies 2014 – 2029 was adopted in July 2014; the document makes comment on air quality

Air Quality

As part of the Local Air Quality Management duties, specified by the Environment Act 1995, the Council continually monitor the quality of the air in the District, producing annual reports and assessments. Generally, the air quality in Tandridge is good and, to date, no Air Quality Management Areas (AQMA) have been declared.

It is noted that access is taken though land within Mid-Sussex;

The Mid Sussex District Plan 2014 – 2031 – Policy DP29

TDC have requested an air quality assessment to accompany the outline application for the project at Land North of Borers Arms Road, Copthorne.

The environment, including nationally designated environmental sites, nationally protected landscapes, areas of nature conservation or geological interest, wildlife habitats, and the quality of people's life will be protected from unacceptable levels of noise, light and air pollution by only permitting development where:

Air Pollution:

- It does not cause unacceptable levels of air pollution;
- Development on land adjacent to an existing use which generates air pollution or odour would not cause any adverse effects on the proposed development or can be mitigated to reduce exposure to poor air quality to recognised and acceptable levels;
- Development proposals (where appropriate) are consistent with Air Quality Management Plans.

This technical note will confirm compliance with the requirements for air quality within TDC and Mid-Sussex.

2.2 Initial Screening

The Environmental Protection UK (EPUK)/ IAQM planning guidance on screening for a formal air quality assessment.
Criteria 1 set out the Criteria to Proceed to Stage 2

A. If any of the following apply:
    - 10 or more residential units or a site area of more than 0.5ha
    - more than 1,000 m2 of floor space for all other uses or a site area greater than 1ha
B. Coupled with any of the following:
    - The development has more than 10 parking spaces
    - The development will have a centralised energy facility or other centralised combustion process

Stage 1 - clearly the project is in excess of 1,000m2 and has in excess of 10 parking spaces

The Environmental Protection UK (EPUK)/ IAQM planning guidance goes on to confirm that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

The project at Land North of Borers Arms Road is not within an AQMA and does not meet the above criteria and as such this technical note is informed accordingly.

3.0 Policy Context

An overview of the relevant policy drivers for the assessment is provided in the following section.

3.1 European Legislation

Within the European Union, ambient air quality is currently regulated through the Ambient Air Quality Directive 2008/50/EC and the Fourth Daughter Directive 2004/107/EC. These directives set limit values and target values for ambient pollutant concentrations. The limit values are legally binding and must not be exceeded, whereas the target values are to be attained where it is cost effective to do so.

The Ambient Air Quality Directive provides limit values for sulphur dioxide (SO2), nitrogen dioxide (NO2), benzene (C6H6), carbon monoxide (CO), lead (Pb) and particulate matter (PM10 and

PM2.5). The Fourth Daughter Directive provides target values for arsenic (As), cadmium (Cd), nickel (Ni), benzo(a)pyrene (B(a)P), mercury (Hg) and polycyclic aromatic hydrocarbons (PAH).

The EU limit values have been adopted into UK law via the Air Quality Standards Regulations 2010.

In the context of the proposed development, the primary pollutants of concern are NO2, PM10 and PM2.5 from traffic on roads close to the site. A summary of the European limit values for the protection of human health for these pollutants is presented in Table 1.

Pollutant	Averaging Period	Limit Value ($\mu g/m^3$)	Comments
NO2	1 Hour	200	Not to be exceeded more than 18 times per calendar year (equivalent to the 99.8th percentile of 1-hour means)
	Calendar Year	40	
PM10	24 Hour	50	Not to be exceeded more than 35 times per year (equivalent to the 90.4th percentile of 24-hour means)
	Calendar Year	40	
PM2.5	Calendar Year	25	Stage 1 LV (to be met by 01/01/15)
	Calendar Year	20	Stage 2 LV (to be met by 01/01/20)

Table 1: European Limit Vaues for the Protection of Human Health

3.2 National Legislation

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Air Quality Strategy for England, Wales and Northern Ireland was published in 2007 and sets out policy targets (objectives) for SO2, NO2, C6H6, CO, Pb, PM10, PM2.5, 1,3-butadiene (C4H6) and PAH. These objectives are generally in line with those set by the European Directives, although more stringent particulate and benzene objectives apply in Scotland (and in Northern Ireland for benzene).

The Air Quality Objectives (AQO) for NO2, PM10 and PM2.5 in England do not differ from those presented in Table 1.

Local Air Quality Management

The framework for Local Air Quality Management (LAQM) in the UK was introduced by the Environment Act 1995. Local Authorities are required to regularly review and assess air quality to establish whether there are any locations where pollutant concentrations exceed the relevant air quality objectives or EU limit values.

Where an exceedance is identified the local authority is obliged to declare an Air Quality Management Area (AQMA) and prepare an Action Plan setting out measures to improve air quality and achieve compliance with the objective(s).

TDC's published their Air Quality Strategy 2024 - 2029 (adopted 19th September 2024), which sets out the longer terms strategy to improve air quality within the area, to include:-

- Reducing energy consumption and emissions by promoting energy efficiency measures, sustainable construction, renewable energy sources and behaviour change.
- Reducing consumption of resources, increasing recycling and reducing waste.
- Supporting council services, residents and businesses to adapt to the impacts of climate change.

The National Planning Policy Framework

The National Planning Policy Framework (NPPF 2024) sets out the Government's policies for planning and how these should be applied. With regard to air quality, the NPPF states that:-

para. 199.

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.

3.3 Local Policy

As noted above, TDC's Local Plan Part 2: Detailed Policies 2014 – makes comment on air quality:-

Air Quality

As part of the Local Air Quality Management duties, specified by the Environment Act 1995, the Council continually monitor the quality of the air in the District, producing annual reports and assessments. Generally, the air quality in Tandridge is good and, to date, no Air Quality Management Areas (AQMA) have been declared.

4.0 Transport Impacts

This section outlines the assessment methodology, taking into account all relevant national and local policies and technical guidance relating to air quality.

This technical note will consider the impact of the change in traffic volumes associated with the proposed new residential uses at Land North of Borers Arms Road, Copthorne. Assess this impact of this on the nearby residential accommodation.

4.1 Operational Traffic

As noted above, the Environmental Protection UK (EPUK)/ IAQM planning guidance states that for developments within or near an AQMA, a detailed assessment of traffic-related impacts is required where:

- There is a change in the annual average daily traffic (AADT) flow of light goods vehicles (LGV) of more than 100 vehicles; and/or
- There is a is a change in the AADT flow of heavy goods vehicles (HGV) of more than 25 vehicles; and/or There is a change in the road re-alignment by more than 5m; and/or
- A new junction is introduced, which will significantly alter vehicle speeds.

The project at Land North of Borers Arms Road does not trigger any of the above requirements.

4.2 Existing Traffic Data

The DFT Road traffic statistics website provides a summary and street-level traffic data for road-links on the motorway, 'A' road and minor road network in Great Britain.

Site number 946161 is located on the B2036, which although is a busier road than Copthorne Bank does give a conservative estimate on traffic levels that could occur on or around Copthorne Bank, including Borers arms road.

The Transport Assessment assumes that circa 50% of the traffic associated with the proposed new development will utilise Copthorne bank – the other 50% utilising Borers Arms Road and is a clear indication of the traffic levels around the proposed development site; as per the screen shot below at Figure 2.

Site number: 946161

Site details

Region	South East
Local authority	Surrey
Road name	B2037
Road classification	'B' road
Managed by	Local authority
Road type	Minor
Start junction	
End junction	
Link length	km (miles)
Easting, northing	532360, 140919
Latitude, longitude	51.15222718, -0.10884824

Location

Annual Average daily flow

Year	Count method	Pedal cycles	Two wheeled motor vehicles	Cars and taxis	Buses and coaches	Light goods vehicles	Heavy goods vehicles	All motor vehicles
2019	Manual count	40	107	8615	86	1630	290	10729

Fig 2 – Annual Average Daily Traffic Flow in Land North of Borers Arms Road area

It can be seen that in 2019 – the latest available data demonstrates an AADF at 10,729 vehicles daily, which includes all vehicles; heavy good vehicles and buses.

this figure can be assumed to be some 10% higher in 2023 – a figure proximate to 11,700.

4.3 Current and Predicted Traffic Generation

The submitted Transport Assessment prepared by SK Transport has undertaken local traffic count surveys on Land North of Borers Arms Rd and also considered traffic generation predictions based upon the appropriate TRICS data.

Clearly, the site under existing use generates minimal traffic movements.

The recorded AADT movements on Land North of Borers Arms Road at the site access point is 4,004 vehicles, over the 24 hour period. The AAWT flows are a little higher at 4,390 vehicles.

The recorded AADT movements on Borers Arms Road at the site access point is 2,437 vehicles, over the 24 hour period. The AAWT flows are a little higher at 2,659 vehicles.

Clearly, the assumed 50/50 split of generated traffic across the two points of access will have a greater impact on Borers Arms Road.

From the TRICS database the development is predicted to generate 478 daily vehicle movements - these are weekday flows, and when compared against the recorded AAWT traffic flows this is a 21.9% increase on this corridor.

The above identifies a potential worst case increase in vehicle movements on Borers Arms Road, at 478 movements; an increase in the AADF at 21.9% based on currently available data.

Clearly, the ”majority” would head south but there will clearly be other options for traffic to disperse along other routes.

5.0 Local Air Quality

Through an analysis of local monitoring data, a description of existing air quality in the vicinity of the proposed development is provided.

5.1 Local Air Quality Monitoring

5.1.1 Automatic Data

TDC do not operate any operate automatic monitoring sites.

5.1.2 Non-automatic Data

Annual mean NO2 concentrations are measured in TDC via an extensive network of passive diffusion tubes. However, there are no monitors in the vicinity of the Land North of Borers Arms Road site.

The nearest and most relevant tubes to the proposed development for the assessment of background and roadside concentrations to appropriate the air quality environment that could be compared to the future development at Land North of Borers Arms Road.

Urban Background - TD26 - Ontario Close (531104 142938) Roadside - TD39 - Land North of Borers Arms Road (536914 139697)

Annual mean concentrations measured at the above stations between 2019 and 2023 have been obtained from the 2024 Air Quality Annual Status Reports (ASR), which are summarised in Table 2, together with the number of measured exceedances.

Site ID	2019	2020	2021	2022	2023
TD26 Ontario Close	19.3	14.1	14.6	16.6	15.8
TD39 Land North of Borers Arms Road	23.4	17.8	21.6	20.6	18.3

Table 2: Annual Mean NO2 Concentrations Measured by Diffusion Tube

The data gives a very clear indication that annual mean NO2 concentrations in the Land North of Borers Arms Road area do not exceed the air quality standard of 40 µg/m3.

Measurements across the UK have shown that the 1-hour mean AQO for NO2 may also be exceeded where the annual mean concentration is greater than 60µg/m3. The above noted data therefore indicates that an exceedance of the short-term objective will also not occur.

5.1.3 DEFRA Mapped Background Concentrations

Background data for NO2 concentrations have been obtained from the Defra UK Background Air Pollution maps.

These 1km grid resolution maps are derived from a complex modelling exercise that takes into account emissions inventories and measurements of ambient air pollution from both automated and non-automated sites.

The screenshot from the website is presented below as Figure 5.

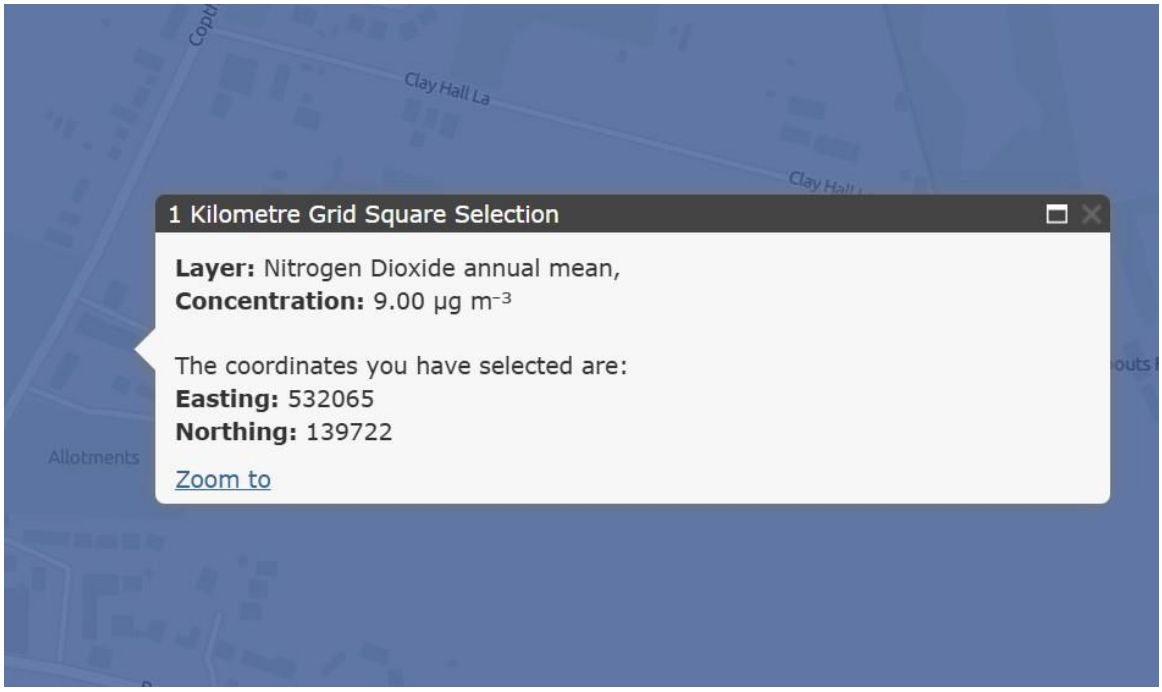

Fig 5 - Background NO2 levels

With a local measured worse case annual mean NO2 level, netting off the background emission levels indicates that the impact of traffic at a roadside location in the Land North of Borers Arms Road area amounts to an annual average of 9.30µg/m3.

6.0 Potential Impacts

The potential impacts and significance of the impacts on air quality of the proposed development at Land North of Borers Arms Road are considered below.

6.1 Traffic Generation Impacts

It has been identified that the traffic generated by the proposed development could increase AADF on Borers Arms Road for traffic by circa 21.9%.

The most appropriate monitoring site recorded an annual long term concentrations of 18.3µg/m3 for NO2 well within required air quality objective standards.

It should be noted that due to a significant change in the vehicle mix on the UK roads, with a very significant reduction in diesel cars (some 30% reduction since 2018) and an increase in electric and hybrid vehicles – the above monitored NO2 levels can be expected to have reduced significantly in recent years.

This technical note would suggest that the worse case impact on air quality within the area would be a 21.9% increase in the impact of traffic related NO2 levels to 11.30µg/m3, an overall figure 20.3µg/m3, an increase at circa 11.1%, but still well within air quality objectives

In practical terms, this can be expected to be considerably lower due to:-

- Vehicles dispersing in either direction along Peppard Road
- Vehicles dispersing on to other parts of the highways network before entering Peppard Road
-

The results are tabulated below.

Borers Arms Road area	NO2
2023 – No development	18.3
2023 – With development	20.3

Table 3 – Uncertainty Analysis – Sensitive Receptors

The data in Table 3 identifies that the predicted increase in NO2 levels are at circa 2.0µg/m3, an increase at 11.1%

The Institute of Air Quality Management (IAQM) offers a framework for describing the impacts (the change in concentration of an air pollutant) at individual receptors.

The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist – see Figure 7.

Long term average concentration at receptor in assessment year	% 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

Fig 6 - Impact descriptors for individual receptors

The assessment location is within the band of 75% or less of AQAL for 2023 without the proposed development; the above noted 11.1% increase in air pollutants would be considered **"Moderate"** following the IAQM guidance.

The guidance also confirms that, the total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small.

However, the above assumes 100% of traffic moving in the same direction and having the maximum impact in the Borers Arms Road network; which clearly it would not as the additional traffic has plenty of opportunity to disperse in other directions.

6.2 Building-related Emissions

The heating and DHW systems at the Land North of Borers Arms Road project are proposed to be 100% electrically driven, and as such, will emit zero local emissions; having no impact on occupants of the subject building or neighbouring sensitive receptors.

6.3 Construction Phase Impacts

6.3.1 Construction Dust

The potential impact of dust generated during site enabling, earthworks and construction works at the proposed development has been undertaken in accordance with the Institute of Air Quality Management (IAQM) construction dust guidance. A full description of the construction dust methodology is provided in **Appendix A** – IAQM Construction Dust Methodology.

A detailed assessment of dust impacts is required where there are human or ecological receptors (such as a SSSI) within:

- 50m of the site boundary; or
- 50m of the route(s) used by construction vehicles on public roads, up to 500m from the site entrance(s).

The IAQM/ SPG methodology allows the potential risk of dust soiling and human health effects to be determined, based primarily on the sensitivity of nearby receptors (human and ecological) and the anticipated magnitude of the dust emissions due to:

- Demolition;
- Earthworks;
- Construction; and
- Track-out (re-suspended dust from vehicle movements)

The assessment of dust risk is also based on professional judgement taking into account factors such as the prevailing wind direction, the proposed construction phasing, the likely duration of dust raising activities, local topography and existing air quality.

A range of best practice mitigation measures are provided within the guidance, which are dependent on the level of dust risk attributed to the site. It is recommended that these measures are incorporated into a Dust Management Plan (DMP) for the proposed development prior to commencement of works on site.

The significance of the residual impacts following appropriate mitigation is determined by professional judgement.

Best Practice Guidance for dust control will be implemented, as appropriate, during the construction phase through the Dust Management Plan (DMP) for the proposed development.

The risk of dust soiling and human health impacts from the site has been assessed as medium:-

- Development of between 1,000 and 15,000 square metres of land and;
- Development of between ten to 150 properties and;
- Potential for emissions and dust to have an intermittent or likely impact on sensitive receptors

Prior to mitigation, therefore in accordance with the IAQM guidance it is recommended that the measures detailed in the table below are incorporated into the DMP.

The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

6.3.2 Sensitivity of the Area to Dust Impacts

The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the site boundary. The area has residential use, with low rise residential accommodation to the north and south – some 100m distant: these occupants would be considered as **HIGH** sensitivity receptors.

Accordingly, it can clearly be assumed that, with 10-100 High Sensitivity Receptors that are within 200m of the site boundary the sensitivity of the area to dust soiling effects on people and property could be considered **LOW**.

Finally, for the potential range of sensitive receptors in the range of 10 - 100 within 200m of the development site, and with the background PM levels at
<24µg/m3, sensitivity of the area to human health impacts would be considered
LOW.

Figure 7 – Local sensitive receptors - Proposed development site – Sensitive Receptors

The precise behaviour of the dust, its residence time in the atmosphere and the distance it may travel before being deposited, will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may

intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

6.3.3 Dust Emission Magnitude

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high risk.

A development is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the potential dust emission
- magnitude as small, medium or large (see Table 4);

and

- the sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

Activity	Dust Emission Class		
	Large	Medium	Small
Demolition	Total building volume >50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level	Total building volume 20,000 – 50 000m^3, potentially dusty construction material, demolition activities 10-20 m above ground level	Total building volume <20,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months
Earthworks	Total site area >10,000 m^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 >8 m in height, total material moved >100,000 tonnes	Total site area 2,500 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes	Total site area <2,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10,000 tonnes, earthworks during wetter months
Construction	Total building volume >100,000 m^3, piling, on site concrete batching; sandblasting	Total building volume 25,000 m3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Track out	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	10 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100 m;	<10 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50 m.

Table 4 – Dust emission risk categories

These factors are combined to determine the risk of dust impacts with no mitigation applied (see Table 8 below). The risk category assigned to the development can be different for each of the four potential activities (demolition, earthworks, construction and trackout).

Demolition – there are no demolition works associated with the proposed development, just site preparation/earthworks.

Accordingly, the magnitude of the dust emission is considered to be ‘small’.

Earthworks - the project will only involve site preparation and levelling, and the development of foundations.

The site is of a significant scale – however, only an element of the site is to be developed, and there is a clear expectation that the development would be phased. Dust emission are considered to be 'medium'.

Construction - Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build.

The proposed development is expected to be of brick/block construction with total construction volume in excess of 47,000m3. There is also the potential for concrete batching on site

The magnitude of the emission during construction is considered to be 'Medium'.

Trackout – the site is significant, with potential for long unmade road and numerous vehicle movements per day. Dust emissions would be considered medium.

Dust Source	Emissions Magnitude
Demolition	Small
Earthworks	Medium
Construction	Medium
Track Out	Medium

Table 5: Magnitude of Dust Emissions

6.3.4 Assessment of Dust Risk Prior to Mitigation

Referring to Chapter 7 of the IAQM "Assess the Risk of Dust Impacts" – tables 3 – 9; a summary of the potential risk of dust impacts prior to mitigation, based on the low sensitivity of the area to dust soiling and human health impacts is presented in Table 6.

Dust Source	Emissions Magnitude	Human Health Risk	Dust Soiling Risk
Demolition	Small	Negligible	Negligible
Earthworks	Medium	Low	Low
Construction	Medium	Low	Low
Track Out	Medium	Low	Low

Table 6: Risk of Dust Impacts Prior to Mitigation

6.3.5 Construction Traffic

Construction traffic will contribute to existing traffic levels on the surrounding road network. However, the temporary increase in traffic is considered unlikely to be significant in terms of total flow or construction duration.

All non-road mobile machinery (NRMM) should use fuel equivalent to ultra-low sulphur diesel (ULSD), especially where a bunkered fuel supply is available.

The impact of vehicular emissions of NO2 and PM10 from construction traffic and on-site machinery on local air quality is considered to be negligible, as a low volume temporary source of local pollution.

Potential dust emission associated with construction traffic have been considered in line with the IAQM guidance in section 6.3.2 above.

7.0 Mitigation

The following mitigation measures will be required during the construction and operational phases in order to minimise the air quality impacts arising from the development.

7.1 Construction Phase

Best practice guidance for dust control will be implemented, as appropriate, but as the risk of dust soiling and human health impacts from the Land North of Borers Arms Road site has been assessed as "Low" prior to mitigation during the construction phase through there is no requirement for Dust Management Plan (DMP).

However, in accordance with the IAQM guidance it is recommended that the measures detailed in Table 7 are incorporated into the DMP. The significance of dust impacts on nearby receptors following the implementation of appropriate and best practice mitigation is considered to be negligible.

Description	Mitigation Measure
General	• 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 • Display the head or regional office contact information.
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.
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.
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 at the site boundary that is at least as high as any stockpiles on site. • Fully enclose the 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. • Cover, seed or fence stockpiles to prevent wind whipping.
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.

Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	• Avoid bonfires and burning of waste materials
Demolition	• Ensure effective water suppression is used during demolition operations. • Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. • Bag and remove any biological debris or damp down such material before demolition.
Construction	• Ensure sand and other aggregates are stored in bundled 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.

Track Out	• Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Access gates to be located at least 10m from receptors where possible.

7.1.1 Method Statement

A method statement should cover all phases of the development and take account of all contractors or sub-contractors. It should be submitted to the local planning authority (LPA) prior to any works being carried out and include a timetable of dust generating activities accompanied with proposed dust control measures.

The content of a Method Statement will be determined by a site specific evaluation but typical features to include are outlined below:-

- Summary of work to be carried out
- description of site layout and access – including proposed haul routes, location of site equipment including supply of water for damping down, source of water (wherever possible from dewatering or extraction), drainage and enclosed areas
- inventory and timetable of all dust generating activities
- list of all dust and emission control methods to be used
- details of any fuel stored on site
- Identification of an authorised responsible person on-site for air quality. Ideally this person needs to have knowledge of pollution control and vehicle emissions;
- summary of monitoring protocols and agreed procedure of notification to the local authority nominated person(s)
- a site log book to record details and actions taken in response to exceptional incidents or dust-causing episodes. It should also be used to record the results of routine site inspections

7.2 Emission Mitigation

The proposed development will include secure cycle spaces to encourage sustainable transport, and this location has good access into Copthorne town centre.

Consideration of local air quality monitoring confirms that long term NO2 levels are clearly within the relevant air quality standards for the proposed new residential accommodation; as well as the local road network approaching Copthorne.

Traffic related emissions will drop further in the coming years with the improving vehicle mix on UK roads, accordingly it is considered that site is appropriate for the residential accommodation use as proposed.

Standard mitigation measure include the development of fossil fuel free heating systems.
In accordance with IAQM guidance, additional mitigation measures are to EV charging for all new dwellings and will also include designated visitor parking spaces for low emission vehicles with fast charging EV facilities.

8.0 Summary and Conclusions

The following summarise the outcomes of the assessment and provide details of any air quality constraints to the proposed mixed-use development on the Land North of Borers Arms Road.

Based on the results of the assessment, it is considered that redevelopment of the site would not cause a significant impact on local air quality.

An assessment has been undertaken to assess the potential impacts on local air quality associated with the operation of the proposed development.

The figures at 20.3µg/m3 is a worse case scenario and is well within the required air quality standards and the decrease in NO2 levels would be considered “moderate”, but beneficial, following the appropriate industry guidance.

An assessment of the potential impacts during the construction phase has also been undertaken in accordance with the latest Institute of Air Quality Management guidance; this has shown that releases of dust and PM10 are likely to occur during site activities. The risk of dust soiling impacts at neighbouring properties and risk to human health has been assessed as **Low**.

Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM10 releases may be effectively mitigated.

In addition, the proposed new uses will utilise all electrical systems for heating and hot water, emitting zero emission within the local environment.

Additional mitigation measures to be detailed at RIBA Stage 4 include the provision of designated car parking spaces for low emission vehicles with fast EV chargers.

APPENDIX A

IAQM CONSTRUCTION DUST METHODOLOGY

Factors defining the sensitivity of a receptor to dust impacts are presented in Table A1.

Receptor Sensitivity	Human Health	Dust Soiling	Ecological
High	- Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM_{10} (a) - Examples include residential dwellings, hospitals, schools and residential care homes.	- Regular exposure - High level of amenity expected. - Appearance, aesthetics or value of the property would be affected by dust soiling. - Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.	- Nationally or Internationally designated site with dust sensitive features (b) - Locations with vascular species (c)
Medium	- Locations where workers are exposed over a time period relevant to the air quality objectives for PM_{10} (a) - Examples include office and shop workers (d)	- Short-term exposure - Moderate level of amenity expected - Possible diminished appearance or aesthetics of property due to dust soiling - Examples include parks and places of work	- Nationally designated site with dust sensitive features (b) - Nationally designated site with a particularly important plant species where dust sensitivity is unknown
Low	- Transient human exposure - Examples include public footpaths, playing fields, parks and shopping streets	- Transient exposure - Enjoyment of amenity not expected. - Appearance and aesthetics of property unaffected - Examples include playing fields, farmland (e), footpaths, short-term car parks and roads	- Locally designated site with dust sensitive features (b)

a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day.
b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).
c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.
d) Does not include workers' exposure to PM_{10} as protection is covered by Health and Safety at Work legislation.
e) Except commercially sensitive horticulture.

Table A1: Receptor Sensitivity

The sensitivity of the area as a whole is dependent on the number of receptors within each sensitivity class and their distance from the source. Human health impacts are also dependent on the existing PM10 concentrations in the area.

Table A2 and Table A3 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively. The sensitivity of the area to ecological impacts is presented in Table A4.

Receptor Sensitivity	Number of Receptors	Distance from the Source			
		<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

Table A2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source				
			<20m	<50m	<100m	<200m	<350m
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	**>100**	**High**	**Medium**	**Low**	**Low**	**Low**
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	**>10**	**Low**	**Low**	**Low**	**Low**	**Low**
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

Table A3: Sensitivity of the Area to Health Impacts from Dust

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

Table A4: Sensitivity of the Area to Ecological Impacts from Dust

The magnitude of the dust impacts for demolition, earthworks, construction and trackout is classified as small, medium or large depending on the scale of the proposed works as detailed in Table A5.

Receptor Sensitivity	Large	Medium	Small
Demolition	- Total building volume >50,000m^3 - Potentially dusty 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 material - Demolition activities 10 - 20m above ground level.	- Total building volume <20,000m^3 - Construction material with low potential for dust release - Demolition activities <10m above ground level - Demolition during wetter months
Earthworks	- Total site area >10,000m^2 - Potentially dusty soil type (e.g. clay) - >10 heavy earth moving vehicles active at any one time - Formation of bunds >8m in height - Total material moved >100,000 tonnes	- Total site area 2,500 - 10,000m^2 - Moderately dusty soil type (e.g. silt) - 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 concrete batching	- Total building volume <25,000m^3 - Material with low potential for dust release (e.g. metal cladding or timber
Trackout	- >50 HGV movements in any one day (a) - Potentially dusty surface material (e.g. high clay content) - Unpaved road length >100m	- 10 - 50 HGV movements in any one day (a) - Moderately dusty surface material (e.g. silt) - Unpaved road length 50 - 100m	- <10 HGV movements in any one day (a) - Surface material with low potential for dust release - Unpaved road length <50m

Table A5: Dust Emission Magnitude

a) HGV movements refer to outward trips (leaving the site) by vehicles of over 3.5 tonnes

For each dust emission source, the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts prior to mitigation as illustrated in Tables A6 and A7.

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible Risk

Table A6: Risk of Dust Impacts from Demolition, Earthworks and Construction

Area Sensitivity	Distance from the Source		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible Risk

Table A7: Risk of Dust Impacts from Trackout