

A large, stylized green leaf graphic that curves across the middle of the page, containing faint, darker green images of various plants and foliage.

Air Quality Assessment

Chichele Road, Oxted

October 2023

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Cala Homes

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1. Introduction

Background

- 1.1 Phlorum Limited has been commissioned by Cala Homes to undertake an Air Quality Assessment (AQA) for a proposed residential development at Chichele Road, Oxted, within the administrative boundary of Tandridge District Council (TDC). The National Grid Reference for the centre of the site is 539393, 153425. A site location plan has been included in Figure 1.
- 1.2 It is understood that the proposal comprises the development of 116 residential dwellings with associated parking and landscaping.
- 1.3 Land use in the vicinity of the application site comprises primarily residential use with agricultural land to the north. Oxted School and St Mary's CofE Primary School are located to the east and west respectively. Oxted train station is located approximately 400m to the south of the site.
- 1.4 The main sources of air pollution in the vicinity of the application site are motor vehicles travelling on the local road network, including Chichele Road and Barrow Green Road both located to the south-west of the site.
- 1.5 Tandridge District Council, the local planning authority, has not currently declared any Air Quality Management Areas (AQMAs) within the district. The closest AQMA to the site is AQMA No.13 (A25), which was declared by Sevenoaks District Council in 2014 for exceedances of the annual mean Air Quality Standard (AQS) for Nitrogen Dioxide (NO₂) and is located approximately 3.7km east of the site.

Scope of Assessment

- 1.6 The focus of this report is the assessment of the suitability of the site, in air quality terms, for its proposed residential end use considering both operational and construction phases and recommending mitigation where necessary. Further assessment of the potential for traffic generated by the proposed development to impact local air quality is also presented.

2. Policy Context

The UK Air Quality Strategy

- 2.1 The UK Air Quality Strategy (UKAQS)¹ sets out air quality standard (AQS) concentrations for a number of key pollutants that are to be achieved at sensitive receptor locations across the UK by corresponding air quality objective (AQO) dates. The sensitive locations at which the standards and objectives apply are those where the population are reasonably expected to be exposed to said pollutants over the particular averaging period.
- 2.2 For those objectives to which an annual mean standard applies, the most common sensitive receptor locations used to compare concentrations against the standards are areas of residential housing. It is reasonable to expect that people living in their homes could be exposed to pollutants over such a period of time.
- 2.3 Schools and children’s playgrounds are also often used as sensitive locations for comparison with annual mean objectives due to the increased sensitivity of young people to the effects of pollution (regardless of whether or not their exposure to the pollution could be over an annual period). For shorter averaging periods of between 15 minutes, 1 hour or 1 day, the sensitive receptor location can be anywhere where the public could be exposed to the pollutant over these shorter periods of time. A summary of the AQS relevant to this assessment are included in Table 2.1, below.

Table 2.1 UK Air Quality Standards and Objectives

Pollutant	Averaging Period	Air quality standard ($\mu\text{g.m}^{-3}$)	Air quality objective
Nitrogen dioxide (NO_2)	1 hour	200	200 $\mu\text{g.m}^{-3}$ not to be exceeded more than 18 times a year
	Annual	40	40 $\mu\text{g.m}^{-3}$
Particulate Matter (PM_{10})	24-hour	50	50 $\mu\text{g.m}^{-3}$ not to be exceeded more than 35 times a year
	Annual	40	40 $\mu\text{g.m}^{-3}$
Particulate Matter ($\text{PM}_{2.5}$)	Annual	20	20 $\mu\text{g.m}^{-3}$

¹ Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) July 2007.

- 2.4 The objectives adopted in the UK are based on the Air Quality (England) Regulations 2000², as amended, for the purpose of Local Air Quality Management. These Air Quality Regulations have been adopted into UK law from the limit values required by European Union Daughter Directives on air quality.
- 2.5 The UKAQS for PM_{2.5} was amended as part of The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020³.
- 2.6 Obligations under the Environment Act 1995 require local authorities to declare an AQMA at sensitive receptor locations where an objective concentration has been predicted to be exceeded. In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to values below the objective levels. There are currently no AQMAs declared within TDC's administrative area.

National Planning Policy Framework

- 2.7 The National Planning Policy Framework (NPPF)⁴, which was updated in September 2023, sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development. A core principle in the NPPF that relates to air quality effects from development is that planning should "contribute to conserve and enhance the natural and local environment" as demonstrated at paragraph 174:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: [...]"

preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability [...]"

- 2.8 With regard to assessing cumulative effects the NPPF states the following at paragraph 185:

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

2 The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.

3 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.

4 Ministry of Housing, Communities & Local Government. (2023). *National Planning Policy Framework*.

- 2.9 With regard to a compliance with relevant limit values and national objectives for air pollutants, along with assessing cumulative effects the NPPF states the following at paragraph 186:

“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 to 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.”

- 2.10 With regard to promoting sustainable transport, paragraph 105 states:

“The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making”.

- 2.11 The NPPF offers a broad framework but does not afford a detailed methodology for assessments. Specific guidance for air quality continues to be provided by organisations such as the Department for Environment, Food and Rural Affairs (Defra), Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM).

National Planning Practice Guidance

- 2.12 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (PPG)⁵, which was updated in June 2021, provides guiding principles on how planning can take account of the impact of new development on air quality. The PPG summarises the importance of air quality in planning and the key legislation relating to it.

⁵ Planning Practice Guidance (PPG) 32. (Updated June 2021). Air Quality.
<http://planningguidance.planningportal.gov.uk/blog/guidance/air-quality/>.

2.13 As well as describing the importance of International, National and Local Policies (detailed elsewhere in this report), it summarises the key sources of air quality information. It also explains when air quality is likely to be relevant to a planning decision, stating:

“Considerations that may be relevant to determining a planning application include whether the development would:

- Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;*
- Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value.”*

2.14 Details are also provided of what should be included within an air quality assessment. Key considerations include:

- Baseline local air quality;*
- Whether the proposed development could significantly affect local air quality during construction/operation; and*
- Whether the development is likely to expose more people to poor air quality.*

2.15 Examples of potential air quality mitigation measures are also provided in the PPG.

Local Planning Policy

- 2.16 TDC is preparing a new Local Plan (covering the period up to 2033) which is currently under examination. Until its adoption, *Tandridge District Core Strategy*⁶ and the *Tandridge Local Plan Part 2: Detailed Policies*⁷ are the primary documents which direct planning in the district. The *Core Strategy* contains no policy of direct relevance to air quality; however, Policy CSP 18: *Character and Design* states:

“Development must not significantly harm the amenities of the occupiers of neighbouring properties by reason of overlooking, overshadowing, visual intrusion, noise, traffic and any other adverse effect.”

- 2.17 The *Local Plan Part 2*⁷ contains policies of relevance to air quality, these include DP7: *General Policy for New Development*, which states:

“Amenity: The proposal does not significantly harm the amenity of neighbouring properties by reason of pollution (noise, air or light), traffic, or other general disturbance;”

- 2.18 DP22: *Minimising Contamination, Hazards & Pollution* states:

“Air Pollution

H. Development will be permitted provided it would not:

1. Have an adverse impact on health, the natural or built environment or amenity of existing or proposed uses by virtue of odour, dust and/or other forms of air pollution; or

2. Be likely to suffer unacceptable nuisance as a result of proximity to existing sources of odour, dust and/or other forms of air pollution.”

- 2.19 A version of the emerging *Local Plan*⁸, which was submitted to the Planning Inspectorate in January 2019 for examination, contains policy of relevance to air quality. Given the emerging *Local Plan* is at an advanced stage, it is assumed that it will be given some material consideration in the determination of planning applications. Policy TLP46: *Pollution and Air Quality* states:

6 Tandridge District Council. (2008). *Tandridge District Core Strategy*.

7 Tandridge District Council. (2014). *Tandridge Local Plan Part 2: Detailed Policies (2014-2029)*.

8 Tandridge District Council. (2019). *Our Local Plan: 2033 (Regulation 22 submission)*.

"Pollution

All development proposals must be located and designed to not cause a significant adverse effect upon the environment, the health of residents or residential amenity by reason of pollution to land, air or water, or as a result of any form of disturbance including, but not limited to noise, light, odour, heat, dust, vibrations and littering.

New residential development located near to existing uses that generate pollutant, noise, odour or light will be expected to demonstrate that the proposal is compatible and will not result in unacceptable living standards.

Planning conditions may be used to manage and mitigate the effects of pollution and/or disturbance arising from development. Where required, conditions limiting hours of construction, opening hours and placing requirements on applicants to submit further proposal details will be implemented in order to ensure impacts on the environment and residential amenity are kept within acceptable limits and where possible reduced.

Air Quality

Development will be supported where it would not result in the national Air Quality Objectives (32) being exceeded; and it would not lead to a significant deterioration in local air quality resulting in unacceptable effects on human health, local amenity or the natural environment.

Proposals for new development should reflect the requirements of the Council's Air Quality Impact Assessments (2018) and any subsequent update, as well as air quality conditions developed by Surrey Air Alliance. Proposals should also be in accordance with the Local Transport Plan and its supporting, Air Quality Strategy, Low Emissions Transport and Electric Vehicle Strategies, and be cognisant of policy TLP36: Ashdown Forest SPA, where relevant."

3. Assessment Methodology

Consultation

- 3.1 TDC's Environmental Health Officer was contacted on 19th September 2023 to discuss and agree the proposed scope of assessment. A response was received on the same day stating that the proposed scope for completing a simple air quality assessment, not requiring detailed dispersion modelling, was considered acceptable.

Guidance

- 3.2 Defra's latest Local Air Quality Management Technical Guidance (LAQM.TG(22))⁹ was followed in carrying out the assessment.
- 3.3 Guidance published by the IAQM on the *Assessment of Dust from Demolition and Construction*¹⁰ was used to assess the risk of dust emissions during the construction phase of the proposed development.
- 3.4 The Greater London Authority (GLA) *Supplementary Planning Guidance*¹¹ on the control of dust from construction has also been referred to, which is considered best practice guidance for London and the wider UK. It details a number of mitigation measures that should be adopted to minimise adverse impacts from dusts and fine particles.
- 3.5 The latest EPUK & IAQM guidance on *Planning for Air Quality*¹² was also referred to throughout the assessment.

Baseline Conditions

- 3.6 Baseline air quality conditions in the vicinity of the site are established through the compilation and review of appropriately sourced background concentration estimates and local monitoring data.

9 Defra. (2022). *Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG (22)*. London: Defra.

10 Institute of Air Quality Management. (2023). *Guidance on the Assessment of Dust from Demolition and Construction*.

11 Greater London Authority. (2014). *The Control of Dust and Emissions During Construction and Demolition*.

12 Environmental Protection UK & Institute of Air Quality Management. (2017). *Land-Use Planning & Development Control: Planning for Air Quality*.

- 3.7 Defra provides estimated background concentrations of the UKAQS pollutants at the UK Air Information Resource (UK-AIR) website¹³. These estimates are produced using detailed modelling tools and are presented as concentrations at central 1km² National Grid square locations across the UK. At the time of writing, the most recent background maps were from August 2020 and based on monitoring data from 2018.
- 3.8 Being background concentrations, the UK-AIR data are intended to represent a homogenous mixture of all emissions sources within the general area of a particular grid square location. Concentrations of pollutants at various sensitive receptor locations can, therefore, be calculated by modelling the emissions from a nearby pollution source, such as a busy road, and then adding this to the appropriate UK-AIR background datum.
- 3.9 TDC local pollutant monitoring data are also considered an appropriate source for establishing baseline air quality in the vicinity of the site. The most recent available data from TDC's *2023 Air Quality Annual Status Report*¹⁴ (ASR) have been included and discussed where relevant.

Construction Phase

- 3.10 The construction phase of the proposed development will involve a number of activities that could potentially produce polluting emissions to air. Predominantly, these will be emissions of dust. However, they could also include releases of odours and/or more harmful gases and particles.
- 3.11 The IAQM's guidance to assess the impacts of construction on human and ecological receptors has been followed in carrying out this air quality assessment. The guidance suggests that where a receptor is located within 350m (50m for statutory ecological receptors) of a site boundary and/or 50m of a route used by construction vehicles, up to 500m from the site entrance, a dust assessment should be undertaken. High sensitivity receptors are considered particularly sensitive when located within 20m of a works area. Figure 2 shows receptors that could be sensitive to dust that are located within 350m of the site boundary.
- 3.12 The Multi Agency Geographic Information for the Countryside (MAGIC) website¹⁵, which incorporates Natural England's interactive maps, has been reviewed to identify whether any statutory ecological sensitive receptors are situated within 50m of the site boundary or within 50m of any routes used by construction vehicles on the public highway, up to 500m from the site entrance.

13 Defra. (2020). UK Air Information Resource Website (UK-AIR). www.uk-air.defra.gov.uk

14 Tandridge District Council. (2023). *2023 Air Quality Annual Status Report (ASR)*.

15 Natural England and MAGIC partnership organisations. Multi Agency Geographic Information for the Countryside. <http://www.magic.gov.uk/> [Accessed September 2023]

Construction Significance

- 3.13 The IAQM guidance suggests that Demolition, Earthworks, Construction and Trackout should all be assessed individually to determine the overall significance of the construction phase.
- 3.14 In the IAQM dust guidance, the first step in assessing the risk of impacts is to define the potential dust emission magnitude. This can be considered 'Negligible', 'Small', 'Medium' or 'Large' for each of the construction stages. Whilst the IAQM provides examples of criteria that may be used to assess these magnitudes, the vast number of potential variables mean that every site is different and therefore professional judgement must be applied by what the IAQM refer to as a "technically competent assessor". The construction phase assessment therefore relies on the experience of the appraiser.
- 3.15 As such, attempts to define precisely what constitutes a negligible, small, medium or large dust emission magnitude should be treated with caution. Factors such as the scale of the work, both in terms of size and time, the construction materials and the plant to be used must be considered.
- 3.16 The second step is to define the sensitivity of the area around the construction site. As stated in the IAQM guidance:
- "the sensitivity of the area takes into account a number of factors:*
- the specific sensitivities of receptors in the area;*
 - the proximity and number of those receptors;*
 - in the case of PM₁₀, the local background concentrations; and*
 - site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust."*
- 3.17 Based on these factors, the area is categorised as being of 'Low', 'Medium' or 'High' sensitivity.
- 3.18 When dust emission magnitudes for each stage and the sensitivity of the area have been defined, the risk of dust impacts can be determined. The IAQM provides a risk of impacts matrix for each construction stage. The overall significance for the construction phase can then be judged from the stages assessed. Again, this is subject to professional judgement.
- 3.19 Combustion exhaust gases from diesel-powered plant and construction vehicles accessing the site will also be released. However, the volumes and periods over which these releases will occur are unlikely to result in any long-term impacts on local air quality and therefore this has been scoped out of the assessment.

Operational Phase

Road Transport Sources

- 3.20 Vehicle emissions will arise from the combustion of fossil fuels in vehicle engines and their subsequent release to atmosphere via tailpipe exhausts. The most significant pollutants released by cars and other vehicles are oxides of nitrogen (NO₂/NO_x) and particulate matter (PM₁₀ and PM_{2.5}). Releases of carbon monoxide (CO) and some volatile hydrocarbons (e.g. benzene and 1,3-butadiene) are of less significance and are not assessed further in this report.
- 3.21 As it is elevated annual mean concentrations of NO₂ and PM₁₀ that have resulted in the declaration of most AQMAs across the UK, these are the pollutants of most concern and they have therefore been the focus of this air quality assessment. PM_{2.5}, which is another fraction of particulate matter, has also been considered.
- 3.22 The latest EPUK & IAQM planning guidance¹² provides indicative thresholds for changes in traffic flows which would require a detailed, dispersion modelling air quality assessment. These are a change in 24-hour annual average daily traffic (AADT) flows exceeding 100 light-duty vehicles (LDVs) and/or 25 heavy-duty vehicles (HDVs) when within, or adjacent to, an AQMA, or a change of AADT flows exceeding 500 LDVs and/or 100 HDVs elsewhere.
- 3.23 Full justification behind the screening of air quality related impacts on existing receptor locations in the local area has been provided in Chapter 6 of this report.

4. Baseline Air Quality

4.1 This chapter is intended to establish prevailing air quality conditions in the vicinity of the application site.

UK-AIR Background Pollution

4.2 UK-AIR predicted background concentrations of NO₂, PM₁₀ and PM_{2.5} for 2019 to 2024 are presented in Table 4.1. These data were taken from the central grid square location closest to the application site (i.e. grid reference: 539500, 153500).

Table 4.1: 2019 to 2024 Background Concentrations of Pollutants at the Application Site

Pollutant	Predicted background concentration (µg.m ⁻³)						Averaging Period	Air quality standard concentration (µg.m ⁻³)
	2019	2020	2021	2022	2023	2024		
NO ₂	13.0	12.4	11.9	11.4	11.0	10.5	annual mean	40
PM ₁₀	15.0	14.7	14.5	14.4	14.2	14.0	annual mean	40
PM _{2.5}	9.9	9.7	9.6	9.5	9.3	9.2	annual mean	20

4.3 The data in Table 4.1 show that annual mean background concentrations of NO₂, PM₁₀ and PM_{2.5}, in the vicinity of the application site between 2019 and 2024 are predicted to be well below their respective AQs.

4.4 The data show that in 2023, NO₂, PM₁₀ and PM_{2.5} concentrations are predicted to be below their respective AQs by approximately 73%, 65% and 54% respectively. As such, annual mean background pollutant concentrations are likely to be below their respective AQs at the application site.

4.5 Concentrations of all pollutants are predicted to decline each year. These reductions are likely due to the forecast effect of the roll out of cleaner vehicles, but also due to UK national and international plans to reduce emissions across all sectors.

Local Sources of Monitoring Data

4.6 Air quality monitoring is considered an appropriate source of data for the purposes of describing baseline air quality. At the time of writing, the most recent ASR¹⁴ released by TDC included local pollutant monitoring data from 2022.

4.7 Despite more recent (2022) data being available, data from 2019 were selected for review and analysis in this assessment due to reductions in traffic flows/emissions, and subsequent pollutant concentrations, as a result of the onset of the COVID-19 Pandemic. This ensures that a ‘worst-case’, conservative approach is followed when assessing the potential impacts that the proposed development may have on local air quality.

Automatic Monitoring

4.8 TDC does not currently undertake continuous (automatic) monitoring in the district.

Non-Automatic Monitoring

4.9 TDC operate an extensive non-automatic, NO₂ diffusion tube monitoring network comprising 30 sites across the district.

4.10 The most recent available monitoring data from diffusion tubes located within 1km of the application site are included in Table 4.2 below.

Table 4.2: Non-Automatic Monitoring Data from TDC NO₂ Diffusion Tubes

Monitor	Type	Distance to site (km)	Annual mean NO ₂ concentration (µg.m ⁻³)			
			2019	2020	2021	2022
TD9	UB	0.2	17.8	12.5	13.2	15.0
TD34	UB	0.3	21.2	16.2	16.5	17.6
TD32	R	0.6	21.9	17.1	17.3	18.4
TD28	R	0.7	28.1	22.2	22.3	22.6
TD30	UB	0.8	23.2	16.8	18.4	21.3

Note: “UB” = Urban Background; “R” = Roadside.

4.11 The data in Table 4.2 show that annual mean concentrations of NO₂ recorded at all diffusion tubes within 1km of the site were consistently below the 40 µg.m⁻³ AQS throughout the 2019 to 2022 monitoring period.

4.12 Diffusion tube TD9 is the closest diffusion tube to the application site. The tube is set in an urban background location approximately 0.2km to the north-west of the site, adjacent to Greenacres Road. In 2019 this tube recorded an annual mean NO₂ concentration of 17.8 µg.m⁻³; 56% below the 40 µg.m⁻³ AQS. NO₂ concentrations recorded at this diffusion tube are likely to be representative of conditions at the site due to the tube’s proximity to the site and its urban background location.

4.13 Diffusion tube TD28 recorded the highest NO₂ concentration in 2019 (28.1 µg.m⁻³); 30% below the 40 µg.m⁻³ AQS. However, NO₂ concentrations recorded at this monitor are likely to be elevated above background conditions in the vicinity of the site, due to the diffusion tube’s proximity to the A25 Westerham Road.

- 4.14 All three diffusion tubes set in an urban background location within 1km of the application site recoded NO₂ concentrations at least 42% below the 40 µg.m⁻³ AQS in 2019.

5. Construction Phase Impacts

- 5.1 The construction phase of the proposed development will involve a number of activities that could produce polluting emissions to air. Predominantly, these will be emissions of dust.
- 5.2 The estimates for the dust emission magnitude for earthworks, construction and trackout below are based on the professional experience of Phlorum's consultants, information provided by the client and Google Earth imagery.

Dust Emission Magnitude

Demolition

- 5.3 As the site is a green field site, no demolition will need to occur. Therefore, the demolition phase will not be considered further within this assessment.

Earthworks

- 5.4 The total site area is expected to be between 18,000m² and 110,000m² therefore, falling into the IAQMs¹⁰ *Medium* dust emission category for earthworks.
- 5.5 No bunds are expected to be formed on site.
- 5.6 It is not yet known how many heavy-earth moving vehicles will be operating on site during the earthworks phase. If this work is carried out by 5 to 10 heavy-earth moving vehicles at any one time, this will fall into the IAQM's *Medium* dust emission category.
- 5.7 Based on the total area of the site and based on professional judgement, the overall dust emission magnitude of the earthworks stage is considered to be *Medium* with reference to the IAQM guidance.

Construction

- 5.8 During construction, activities that have the potential to cause emissions of dust may include concrete batching, sandblasting and piling. Localised use of cement powder and general handling of construction materials also have the potential to generate dust emissions, as does the effect of wind-blow from stockpiles of friable materials. Piling is expected to occur on site.
- 5.9 The main construction materials proposed for the development include concrete foundations, timber frames and masonry skin.
- 5.10 Upon completion, the proposed development is expected to have a total construction volume of between 12,000m³ and 75,000m³, falling into the IAQM's *Medium* dust emission magnitude category for construction.

5.11 Based on the information above, and following IAQM guidance, the overall dust emission magnitude for the construction phase is considered to be *Medium*.

Trackout

5.12 Construction traffic, when travelling over soiled road surfaces, has the potential to generate dust emissions and to also add soil to the local road network. During dry weather, soiled roads can lead to dust being emitted due to physical and turbulent effects of vehicles.

5.13 The site is expected to be accessed from Chichele Road, with another potential access route via Bluehouse Lane. Access roads to the site will be surfaced with tarmac early in the development process. Therefore, paved road surfaces will be utilised throughout the construction phase. It is currently unknown how many heavy duty vehicles will access the site per day.

5.14 As no unpaved roads will be utilised during the construction phase of the development, and with reference to the IAQM guidance, the dust emission magnitude for the trackout phase is considered to be *Small*.

Emission Magnitude Summary

5.15 A summary of the dust emission magnitude as a result of the activities of Earthworks, Construction and Trackout as specified in the IAQM guidance, and discussed above, are listed in Table 5.1 below.

Table 5.1: Dust Emission Magnitude for the Construction Activities, Based on the IAQM's Guidance

Activity	Dust Emission Magnitude
Earthworks	Medium
Construction	Medium
Trackout	Small

Sensitivity of the Area

5.16 Having established the emission magnitudes for each phase above, the sensitivity of the area must be considered to establish the significance of effects. The effect of dust emissions depends on the sensitivity of each receptor.

5.17 High sensitivity human receptors include residential dwellings, schools, and hospitals, but can include locations such as car showrooms when considering the impacts of dust soiling.

- 5.18 The impacts of dust emissions from the sources discussed above have the potential to cause an annoyance to human receptors living in the local area. Within distances of 20m of the site boundary there is a high risk of dust impacts, regardless of the prevailing wind direction. Up to 100m from the construction site, there may still be a high risk, particularly if the receptor is downwind of the dust source.
- 5.19 With the exponential decline in dust with distance from dust generating activities, it is considered that for receptors more than 350m from the site boundary, the risk is negligible. Furthermore, the risks at over 100m only have the potential to be significant in certain weather conditions, e.g. downwind of the source during dry periods.
- 5.20 The approximate number of high sensitivity human receptors in the vicinity of the site is detailed in Table 5.2 below and shown in Figure 2.

Table 5.2: Approximate Number of High Sensitivity Receptors Close to the Site

Distance to site (m)	Number of high sensitivity receptors	Receptor Details
<20	10-20	Residential dwellings
<50	>600*	Residential dwellings, St Mary's CofE Primary School
<100	>2,000*	Residential dwellings, St Mary's CofE Primary School, Oxted School, Woodlands Day Care
<350	>2,500*	Residential dwellings, St Mary's CofE Primary School, Oxted School, Woodlands Day Care, The Larks Laverock Pre-School, Oxted Pre-School, Little Barn Preschool, Fennies Nursery and Preschool, Barchester Tandridge Heights Memorial Care Home

Note: * includes approximate number of residents at local education and care facilities.

- 5.21 Figure 3 shows that the predominant wind direction at the closest relevant meteorological station at Charlwood Airport (2019) is from the south-west. As shown in Table 5.2, there are between 10 and 20 high sensitivity receptors within 20m of the site downwind of the prevailing wind direction and numerous high sensitivity receptors within 50m of the site and as such, the sensitivity of the area to dust soiling impacts can be defined as *High*.
- 5.22 UK-AIR predicted annual mean concentrations for PM₁₀ indicate that concentrations in the vicinity of the site and the surrounding area are likely to be below 24 µg.m⁻³, which represents the IAQM's threshold for an area to be considered *Low Sensitivity* for PM₁₀ related human health effects. This provides a good indication that PM₁₀ annual mean concentrations are likely to be below the respective AQSs at the site and adjacent uses and therefore the sensitivity of the area to human health impacts is defined as *Low*.

- 5.23 Review of the MAGIC website¹⁵, which incorporates Natural England’s interactive maps, has identified no statutory ecological receptors within 50m of the site, or within 50m of roads to be used by construction traffic, up to 500m from the site entrance.
- 5.24 The closest statutory ecological site is Woldingham and Oxted Downs Site of Special Scientific Interest (SSSI). This ecological site is located over 800m to the north-west of the site, at its closest point. Therefore, based on distance alone, the construction of the proposed development can be considered to have a *Negligible* impact on local ecological sites.

Risk of Impacts

- 5.25 Having established the potential dust emission magnitudes and sensitivity of the area, the risk of impacts can be determined in accordance with the IAQM guidance. These are summarised in Table 5.3.

Table 5.3: Summary of Impact Risk by Construction Stage Based on the IAQM’s Dust Guidance.

Stage	Impact Risk		
	Nuisance Dust	Ecology	PM ₁₀
Earthworks	Medium	Negligible	Low
Construction	Medium	Negligible	Low
Trackout	Low	Negligible	Negligible

- 5.26 Overall, the construction phase of the proposed development is considered to present a *Medium Risk* for nuisance dust soiling effects, a *Low Risk* for PM₁₀ health effects and to be *Negligible* for ecological impacts, in the absence of mitigation.

Site Specific Mitigation

- 5.27 The GLA guidance¹¹ suggests a number of mitigation measures that should be adopted in order to minimise impacts from dusts and fine particles. Appropriate measures that could be included during construction of the proposed development include:
- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
 - where such work must take place, water suppression should be used to reduce the amount of dust generated;
 - skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;

- 🌱 no burning of any materials should be permitted on site;
 - 🌱 any excess material should be reused or recycled on-site in accordance with appropriate legislation;
 - 🌱 developers should produce a waste or recycling plan;
 - 🌱 following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;
 - 🌱 stockpiles should be stored in enclosed or banded containers or silos and kept damp where necessary;
 - 🌱 hard surfaces should be used for haul routes where possible;
 - 🌱 haul routes should be swept/washed regularly;
 - 🌱 vehicle wheels should be washed on leaving the site;
 - 🌱 all vehicles carrying dusty materials should be securely covered; and
 - 🌱 delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.
- 5.28 In addition, the IAQM lists recommended mitigation measures for low, medium and high dust impact risks. The highly recommended mitigation measures for *Medium Risk* sites are included in Appendix A of this report.
- 5.29 Where dust generation cannot be avoided in areas close to neighbouring properties, additional mitigation measures should be put in place, such as: windbreaks, sprinklers, and/or time/weather condition limits on the operation of some items of plant or the carrying out of activities that are likely to generate a particularly significant amount of dust.

Residual Effects

- 5.30 After the implementation of the mitigation measures listed above and in Appendix A, the significance of each phase of the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be *Negligible*.

6. Operational Phase

Impacts on Local Air Quality




- 6.1 The latest EPUK & IAQM planning guidance¹² provides indicative thresholds for changes in traffic flows which would require a detailed air quality assessment when outside an AQMA. These are a change in 24-hour AADT flows of more than 500 LDVs and/or 100 HDVs on any one road. Changes below these thresholds can be reasonably considered to have an insignificant impact on local air quality.
- 6.2 Information provided by Motion, the transport consultants for the project, indicate that the development is predicted to generate a total AADT flow of 584 (all LDVs, no HDVs). This total AADT flow is expected to split on the local road network with 73% of the total flow (426 AADT) expected to travel on Chichele Road towards Barrow Green Road and 27% of the total flow (158 AADT) expected to travel south on Chichele Road towards Bluehouse Lane. Only 1% (4 AADT) of the flow travelling on Chichele Road towards Barrow Green Road are then expected to travel north on Silkham Road. The AADT flow generated by the proposed development is below the AADT generation thresholds prescribed within the EPUK & IAQM guidance, and therefore it can reasonably be assumed that the operation of the proposed development would not significantly impact local air quality.

Site Suitability

- 6.3 LAQM.TG (22)⁹ (Tables 7-7 and 7-8) sets out the classification of monitoring locations and where these are in relation to sources of pollution. The guidance states that an urban background location is, as follows:

"An urban location distanced from sources and therefore broadly representative of city-wide background conditions, e.g. urban residential areas."

- 6.4 The AEA Diffusion Tube for Ambient NO₂ Monitoring: Practical Guide (AEA guidance)¹⁶ provides further detailed definitions which help to classify urban background sites. Specifically, Section 3.2.2 states that, where a site meets the following criteria, it can be reasonably defined as being set in an urban background location, away from adverse impacts associated with emissions from road sources:

-  >50m from any major source of NO₂ (e.g., multi-storey car parks);
-  >30m from any very busy road (>30,000 vehicles per day);
-  >20m from any busy road (10,000 – 30,000 vehicles per day);

¹⁶ AEA Energy and Environment. (2008). *Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users*.

- >10m from any main road; and
 - >5m from locations where vehicles may stop with their engines idling.
- 6.5 The primary sources of air pollution within the vicinity of the site are motor vehicles travelling on the nearby local road network including Chichele Road and Barrow Green Road to the south-west of the site.
- 6.6 Chichele Road is not classed as an 'A' road by the Department for Transport (DfT) and can therefore reasonably be classified as a 'minor road' and a location where vehicles may stop with their engines idling, with reference to the AEA guidance¹⁶. All highly sensitive receptors proposed at the application site are distanced over 50m from Chichele Road, and over 100m from Barrow Green Lane.
- 6.7 Furthermore, existing sensitive receptors, including school pupils at St Mary's CofE Primary School located adjacent to the application site are distanced over 25m from Chichele Road and over 15m from Silkham Road. Silkham Road can also reasonably be classed as a 'minor' road according to the DfT and a location where vehicles may stop with their engines idling, with reference to the AEA guidance¹⁶. As mentioned previously only 1% (4 AADT) of the 426 traffic flows generated by the development travelling on Chichele Road are expected to travel on Silkham Road, the closest road to St. Mary's School.
- 6.8 As all highly sensitive receptors proposed at the application site, and at the nearby St Mary's CofE Primary School, are distanced sufficiently from the local road network, all sensitive uses at both locations can be considered to be set in an urban background location with reference to the AEA guidance. Following LAQM.TG(22) guidance, it is expected that pollutant concentrations across these areas are likely to be similar to those identified at urban background sites within the local area, which are well below the relevant AQSS.
- 6.9 UK-AIR background concentrations as well as local pollutant monitoring data from representative urban background monitors within the TDC's authoritative boundaries, including diffusion tubes TD9, TD30 and TD34, indicate that NO₂, PM₁₀ and PM_{2.5} concentrations across the application site are likely to be well below their relevant AQSS, and are expected to decrease further in future years.
- 6.10 Therefore, the site is anticipated to be suitable, in air quality terms, for its proposed end use, and no further assessment of site suitability is required.

Mitigation

- 6.11 Mitigation measures already proposed to offset any potential air quality impacts of the proposed development include:
- Use of Air Source Heat Pumps (ASHP) to meet heating and hot water demands;
 - Provision of electric vehicle charging infrastructure for every parking space on site;

- 🌱 Implementation of a travel plan, including mechanisms to discourage high emission vehicle use and encourage uptake of low emissions technologies as well as the provision of public transport vouchers for new occupants;
- 🌱 A welcome pack available to all new occupants to encourage the use of sustainable transport modes;
- 🌱 'Cable to property' broadband provision to enable working from home;
- 🌱 Cycle storage; and
- 🌱 Improvements and connections to cycle paths and the local cycle network.

7. Discussion

Construction Phase Impacts

- 7.1 The construction phase of the proposed development could potentially give rise to emissions which could cause dust soiling effects on adjacent uses. Following IAQM guidance, the construction phase of the proposed development can be considered to be *Medium Risk* with regard to nuisance dust soiling effects, *Low Risk* for PM₁₀ health effects and to be *Negligible* for ecology, in the absence of mitigation.
- 7.2 Following the implementation of the mitigation measures provided in Appendix A and listed in Section 5.27, emissions from the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be *Negligible*, thus complying with the requirements of the National Planning Policy Framework.

Operational Phase Impacts

- 7.3 The need for a detailed pollutant dispersion modelling assessment of the proposed development's sensitivity to local air quality has been screened out using Defra and AEA guidance along with national (UK-AIR) and local pollutant monitoring data. This was primarily due to proposed sensitive uses at the site being well distanced from local pollution sources (roads) and background concentrations being anticipated to be well below relevant AQS's within the immediate vicinity of the application site. Therefore, the site is considered to be suitable for the introduction of new residential receptors, and no further assessment of site suitability is considered necessary.
- 7.4 As the proposed development is not expected to generate traffic flows exceeding the Environmental Protection UK and the Institute of Air Quality Management thresholds on any specific road link, the need to undertake a detailed dispersion modelling assessment of the proposed development's impact on local air quality at existing sensitive receptor locations has been screened out. Therefore, it can be reasonably assumed that the operation of the proposed development would have an insignificant impact on local air quality.

8. Conclusions

- 8.1 Phlorum Limited has been commissioned by Cala Homes to undertake an Air Quality Assessment for a proposed residential development at Chichele Road, Oxted. The proposal comprises the development of 116 residential dwellings with associated parking and landscaping.
- 8.2 UK Air Information Resource background concentrations and local air quality monitoring results from the wider area indicate that air quality in the local area is good, with pollutant concentrations across the site expected to be well below relevant UK Air Quality Standard concentrations.
- 8.3 The construction phase of the proposed development could give rise to emissions which could cause dust soiling effects on adjacent uses. However, by adopting appropriate mitigation measures to reduce emissions and their potential impact, there should be no significant residual effects, thereby complying with the requirements of the National Planning Policy Framework.
- 8.4 The operation of the proposed development is not expected to introduce new, sensitive receptors into an area of existing poor air quality, nor is it anticipated to significantly impact on local air quality.
- 8.5 Therefore, the proposed development is expected to comply with all relevant local and national air quality policy. Air quality should not, therefore, pose any significant obstacles to the planning process.

Figures and Appendices

Figure 1: Site Location Plan

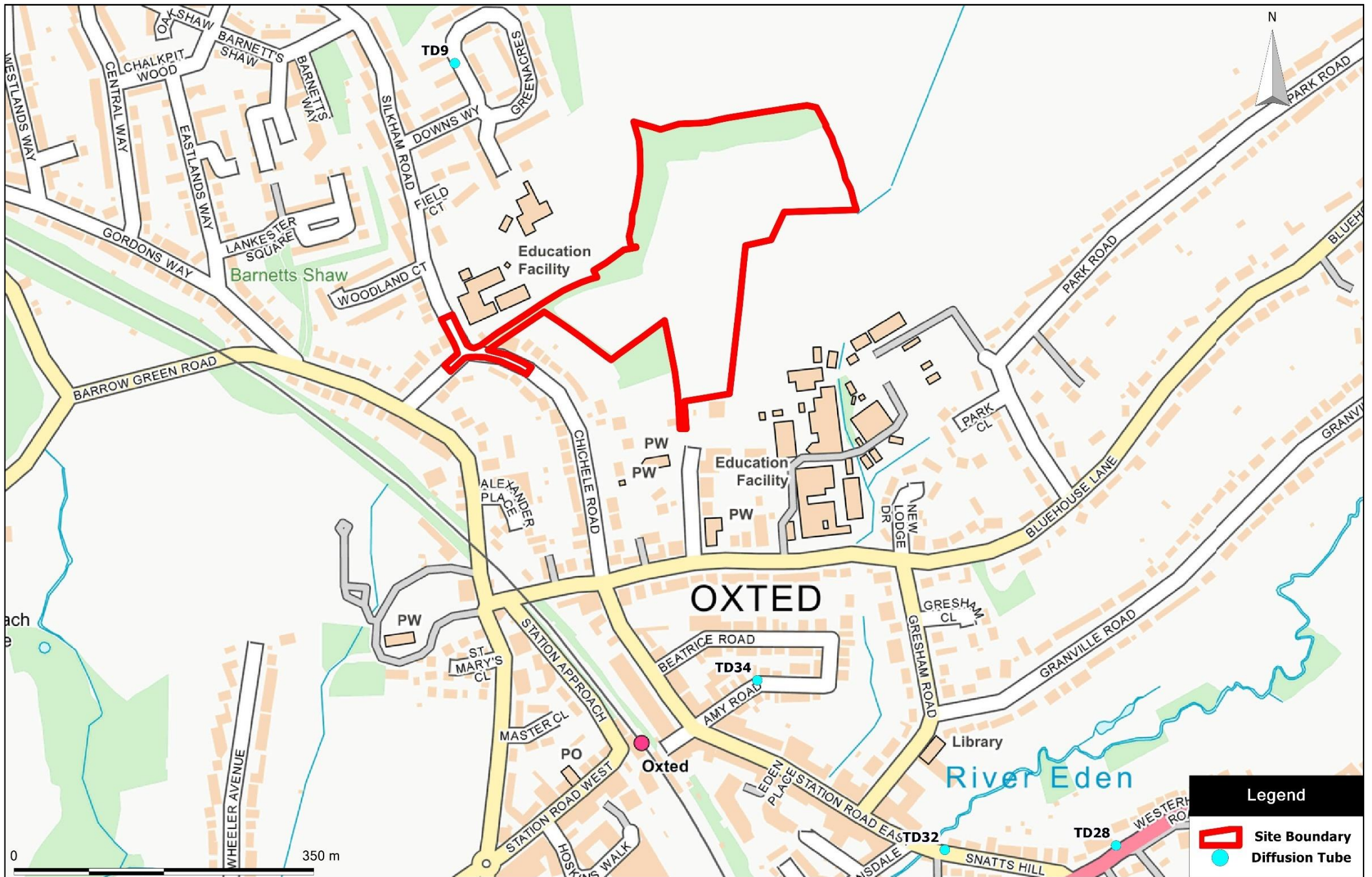


Figure 1: Site Location Plan

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Figure 2: Construction Phase

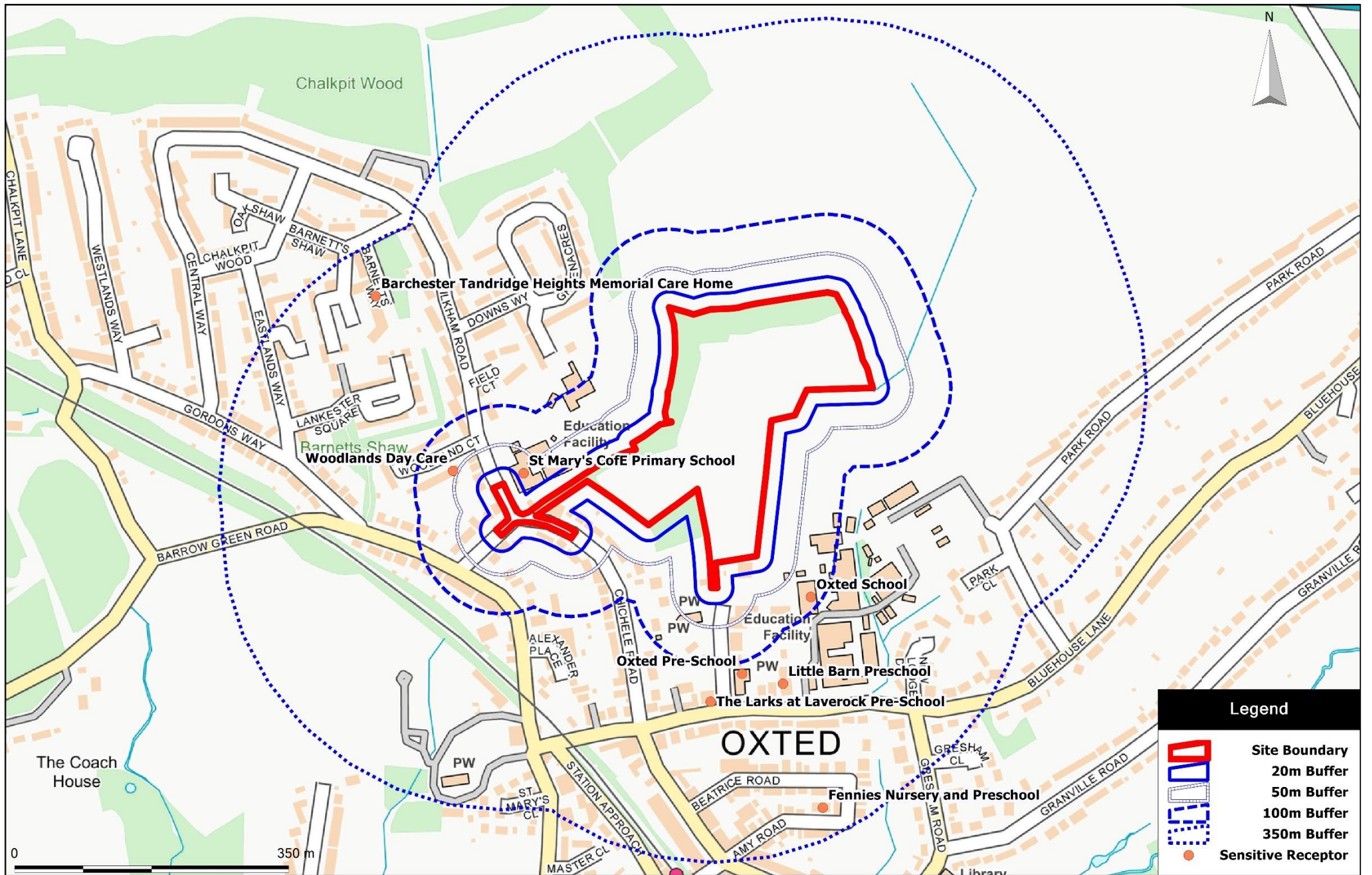


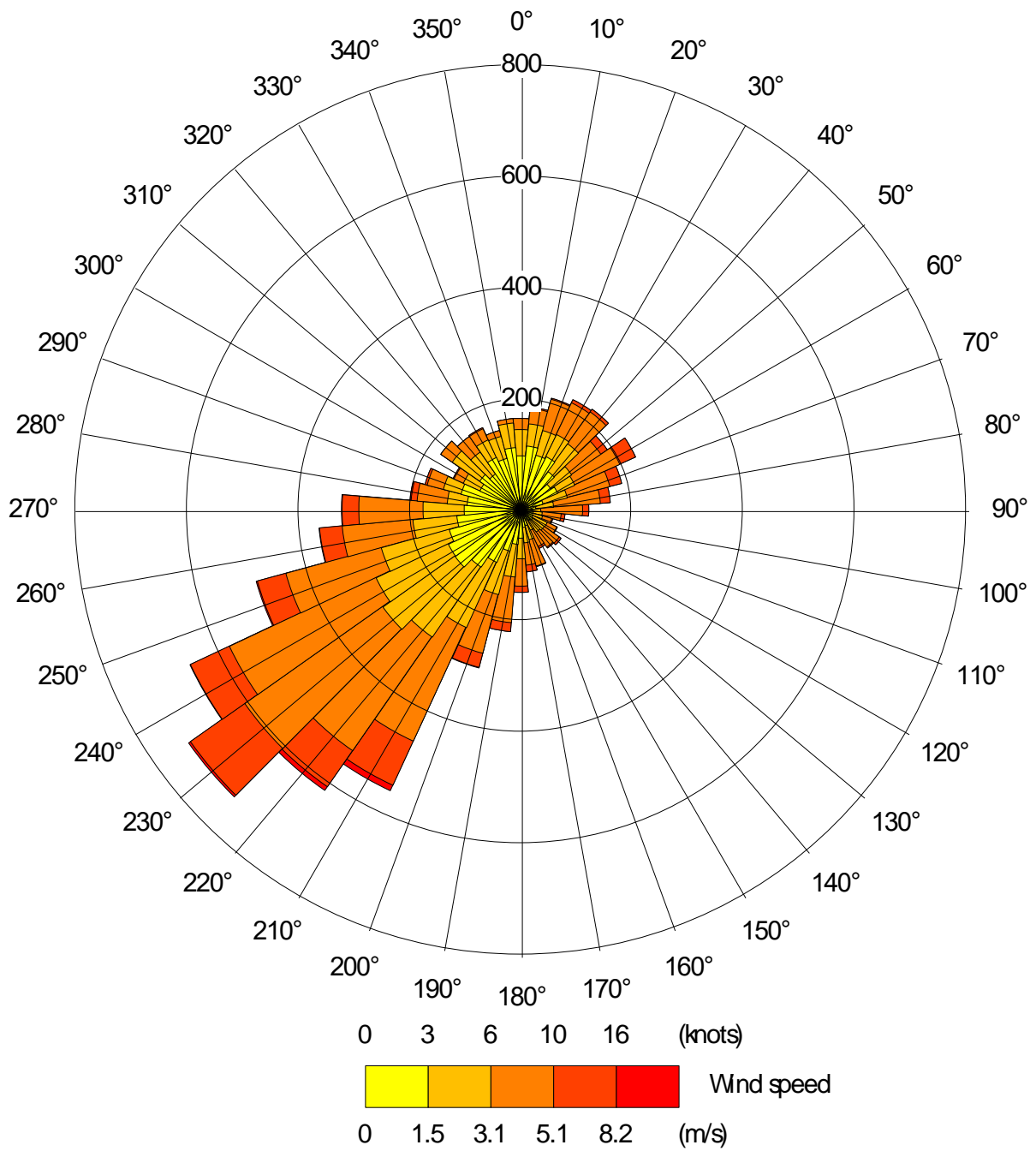
Figure 2: Construction Phase

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Figure 3: Wind Rose for Charlwood (2019)



Appendix A: IAQM Highly Recommended Mitigation Measures for Medium Risk Sites

IAQM Highly Recommended Mitigation Measures for sites with a Medium Risk of Dust Impacts

Please refer to the IAQM's Construction Dust Guidance (*Guidance on the assessment of dust from demolition and construction (2023)*)¹⁰ and *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (2018)*¹⁷ for further, "desirable", mitigation measures.

Communications

- 🌱 Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
- 🌱 Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- 🌱 Display the head or regional office contact information.
- 🌱 Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this Appendix. The DMP may include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections.

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 exception incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.

Monitoring

- 🌱 Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked.
- 🌱 Increase the frequency of inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- 🌱 Agree dust deposition, dust flux, or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by the IAQM on monitoring during demolition, earthworks and construction.

Preparing and Maintaining the Site

- 🌱 Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- 🌱 Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- 🌱 Fully enclose site or specific operations where there is a high potential for dust

¹⁷ IAQM. (2018). *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites*. https://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf

production and the site is active for an extensive period.

- 🌱 Avoid site runoff of water or mud.
- 🌱 Keep site fencing, barriers and scaffolding clean using wet methods.
- 🌱 Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on site cover as described below.
- 🌱 Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- 🌱 Ensure all vehicles switch off 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 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.
- 🌱 Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- 🌱 Bag and remove any biological debris or damp down such material before demolition.

Construction

- 🌱 Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Trackout

- 🌱 Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- 🌱 Avoid dry sweeping of large areas.
- 🌱 Ensure vehicles entering and leaving sites are covered to prevent escape of materials

during transport.

- 🌱 Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- 🌱 Record all inspections of haul routes and any subsequent action in a site log book.
- 🌱 Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- 🌱 Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior leaving the site where reasonably practicable).
- 🌱 Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- 🌱 Access gates to be located at least 10m from receptors where possible.

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