



Havant and South Downs College

Air Quality Assessment

For Places for People

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1. INTRODUCTION

Hydrock have been commissioned by Places for People to prepare an Air Quality Assessment (AQA) to support the planning application for residential dwellings (the 'Proposed Development'), at Havant and South Downs College (The 'Site'). The Site is located within Crookhorn, Waterlooville within the administrative boundary of Havant Borough Council (HBC).

The Site is centred on the National Grid Reference (NGR); x468960, y107210 and shown below in Figure 1. College Road borders the western Site boundary, beyond which lie residential dwellings. Immediately to the north lies Havant and South Downs College (HSDC) South Downs Campus, with grassland bordering the eastern and southern boundaries. The A3(M) is situated approximately 225m to the east of the Site. The wider Site locale is primarily characterised by suburban residential dwellings.



Figure 1 - Site Location

1.1 Proposed Development

The proposals seek full planning permission for a residential development comprising 56 houses and 46 flats, totalling 102 residential units. The proposals also include a new site access from College Road, secure cycle storage and 164 car parking spaces.

1.2 Purpose of Air Quality Assessment

The purpose of this assessment is to provide the following:

- Review of baseline air quality to assess the risk of exceedance of Air Quality Strategy (AQS) Objectives at the Site and surrounding area;
- Construction Phase Assessment to conclude on the requirements for mitigation to reduce the significance of impacts to negligible during this phase; and,
- Screening assessment of potential adverse impacts during the operational phase in the anticipated opening year of 2023.

2. RELEVANT LEGISLATION

2.1 Air Quality Regulations

The governing European Union Directive on ambient air quality and cleaner air for Europe (2008/50/EC)¹ came into force in 2008, and provides statutory guidance on air quality. This presents statutory requirements for the protection of human health and ecosystems through long and short-term limit values for: oxides of nitrogen (NO_x), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), particulate matter with a diameter of less than 10 microns (PM₁₀), particulate matter with a diameter of less than 2.5 microns (PM_{2.5}) carbon monoxide (CO), lead, benzene and ozone (O₃). The above legislation replaces the EU's previous three daughter directives.

The targets and limit values set within the 2008/50/EC directive were transposed into United Kingdom (UK) law through the Air Quality Standards Regulations 2010². These set out how the government has interpreted the EU directives noted above. One of the main additions the regulatory framework for PM_{2.5}.

The EU (Withdrawal Agreement) Act 2020 outlines the implementation of the air quality limit values that are included in the Air Quality Regulations (SI 2010 No.1001)² and as amended (SI 2016 No.1184)³. Additionally, the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (SI 2019 74) and the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020⁴ (SI 2020 1313) came into force on 31 December 2020 to amend the Air Quality Regulations (SI 2010 No.1001) to account for EU withdrawal.

2.2 Air Quality Strategy

The United Kingdom Air Quality Strategy⁵ sets out the government's policies and framework for improving air quality in the UK with the aim of meeting the requirements of above legislation. The Air Quality Strategy also outlines the Limit Values, Target Values, Standards, Objectives, Critical Levels and Exposure Reduction Targets for the protection of human health and the environment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report). Those relevant to this assessment is provided below, in Table 1:

Table 1 - UK Air Quality Objectives

Pollutant	Averaging Period	AQALs	
NO ₂	1 Hour Mean	200 µg/m ³	Not to be exceeded more than 18 times in a year.
	Annual Mean	40 µg/m ³	
PM ₁₀	24 Hour Mean	50 µg/m ³	Not to be exceeded more than 35 times in a year.
	Annual Mean	40 µg/m ³	
PM _{2.5}	Annual Mean	20 µg/m ³	

¹ EC, "Directive 2008/50/EC of the European Parliament and of the Council," May 21, 2008, 44.

² The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001

³ The Air Quality Standards (Amendment) Regulations 2016 – Statutory Instrument 2016 No. 1184

⁴ The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020

<https://assets.publishing.service.gov.uk/media/5f6b6452d3bf7f723b6c35fb/SI-The-Environment-Miscellaneous-Amendments-EU-Exit-Regulations-2020.pdf>

⁵ Defra, "The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Volume 1" (Department for Food, Environment and Rural Affairs (Defra), July 2007), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf.

Defra's Local Air Quality Management Technical Guidance 2016 (LAQM.TG(16))⁶ provides guidance on where the above AQAL's should apply. This is summarised below, in Table 2:

Table 2 - Summary of where AQALs should apply:

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

2.3 Local Air Quality Management

Obligations under the Environment Act 2021⁷ (which provides an amendment to the Environment Act 1995⁸) requires Local Authorities (LA) to periodically review and assess the quality of air within their administrative area. Where any of the prescribed AQALs are not likely to be achieved the LA concerned must designate an Air Quality Management Area (AQMA). In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to deliver improvements in local air quality in pursuit of the AQAL. **HBC do not currently have any declared AQMAs within their borough boundary.**

2.4 National Planning Policy Framework

The National Planning Policy Framework (NPPF)⁹ sets out the Government's planning policy for England. It requires planning decisions for any new development to prevent new and existing development from contributing to, or being put at risk from, unacceptable levels of air pollution (paragraph 174). It also states that planning decisions should sustain and contribute towards compliance with relevant limit values or national objectives for

⁶ Defra, "LAQM Technical Guidance LAQM.TG16" (Department for Food, Environment and Rural Affairs (Defra), April 2021), <https://laqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf>

⁷ <https://bills.parliament.uk/bills/2593/publications>

⁸ Environment Agency, "Environment Act 1995" (The Environment Agency, 2002), <http://www.legislation.gov.uk/ukpga/1995/25/contents>.

⁹ Ministry of Housing, Communities and Local Government, "National Planning Policy Framework," July 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004408/NPPF_JULY_2021.pdf.

air pollutants, taking into account the presence of AQMAs and Clean Air Zones (CAZ)s (paragraph 186), and the cumulative impacts from other sites (paragraph 185).

Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. Furthermore, planning decisions should ensure that any new development in AQMAs and CAZs is consistent with the local air quality action plan.

Also, to help reduce congestion and emissions, to improve air quality and public health, significant development should be focused on locations which are / can be made sustainable through limiting the need to travel (paragraph 105).

2.5 Planning Practice Guidance

Reference ID 32 (Air Quality) of the National Planning Practice Guidance (NPPG)¹⁰, which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The NPPG summarises the importance of air quality in planning and the key legislation relating to it.

In particular, it provides some examples of mitigation measures to reduce air quality impacts, including:

- Maintaining adequate separation distances between sources of air pollution and receptors;
- Using green infrastructure, in particular trees, where this can create a barrier or maintain separation between sources of pollution and receptors;
- Appropriate means of filtration and ventilation;
- Including infrastructure to promote modes of transport with a low impact on air quality (such as electric vehicle charging points);
- Controlling dust and emissions from construction, operation and demolition; and,
- Contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development.

2.6 Local Planning Policy

2.6.1 Adopted Local Development Framework

HBC's adopted Local Plan comprises the Core Strategy (2011)¹¹ and the Site Allocations Plan (2014)¹². The Core Strategy contains Policy DM10: Pollution, which is relevant to air quality:

"DM10 Pollution

Development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants will only be permitted where all of the following relevant criteria can be met:

- 1. The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk.**
- 2. National air quality standards or objectives would not be breached. "**

¹⁰ Ministry of Housing, Communities & Local Government, "Reference ID (32) Air Quality" (Ministry of Housing, Communities & Local Government, 2019), <https://www.gov.uk/guidance/air-quality--3>.

¹¹ <https://cdn.havant.gov.uk/public/documents/ADOPTED%20CORE%20STRATEGY%20.pdf>

¹² <https://cdn.havant.gov.uk/public/documents/Adopted%20Allocations%20Plan%20July%202014%20-%20Copy.pdf>

Policy DM12: Mitigating the Impacts of Travel, is also relevant to consider:

“DM12 Mitigating the Impacts of Travel

*New developments will be required to mitigate their travel impact, **including the environmental impacts of travel (such as noise, air and visual pollution)** and impacts on amenity, health and climate change by ensuring that, where relevant, the following criteria are met:*

- 1. Adequate provision is made for integrated and improved transport infrastructure or appropriate mitigation measures, through direct improvements and S106 contributions in accordance with the Hampshire County Council Transport Contributions Policy.*
- 2. The submission of a transport assessment and travel plan alongside any planning application on proposals for major development or where a proposal is likely to have significant transport implications.*
- 3. The submission of a transport statement must accompany planning applications to explain changes to travel demand.*
- 4. A bond is provided which will be used to mitigate negative travel impacts of the development, should the travel plan fail to achieve its targets. This bond will be held by the relevant local transport authority.*
- 5. In relation to outline planning applications, a framework for the preparation of travel assessments and travel plans will be submitted with the planning application proposals.”*

2.6.2 Emerging Policy

In addition to the above, the Emerging Havant Borough Local Plan, which sets out the vision for future development in the borough, should also be considered. However, until adoption the Emerging Local Plan has limited weight in determining planning applications. Within the Emerging Local Plan, policies E22 and E23 are relevant:

“E22 | Amenity and pollution

Development proposals will be permitted where:

- a. Projected levels of noise, odour, vibration, light, water or air pollution do not have a likely significant negative effect on the amenity of existing and future users of the site, nearby occupiers or the wider environment; or*
- b. Measures are provided which are suitable for the purposes intended and will ensure that any likely significant negative effect on receptor(s) are mitigated to an acceptable level.”*

“E23 | Air quality

Offsetting emissions

- a. Major development proposals will be expected to provide mitigation measures which offset emissions and are proportionate to the scale and nature of the development.*

Threshold based assessment

In addition to a., development proposals of 150 or more (gross) residential units, 1,000 sqm or more of commercial floorspace, or which are likely to materially alter the traffic flow on the local highway network will be permitted where:

b. Projected levels of air pollution or emissions associated with the development would not result in a significant deterioration of current air quality at a location where national air quality objectives or limit values apply; or

c. Measures are provided which demonstrably mitigate the impact on air quality to an acceptable level.”

2.6.2.1 Habitat Regulation Assessment

Havant Borough includes numerous nature conservation areas of national and international significance. These sites may be adversely affected by increases in air concentrations of pollutants, particularly NO_x and ammonia, and the deposition of these pollutants within the habitats. The designated sites considered to be of relevance to this assessment are Chichester and Langston Harbours RAMSAR, Site of Special Scientific Interest (SSSI) and Solent Maritime Special Area of Conservation (SAC). With regard to these sites, the HRA¹³ states that:

“Air quality impacts on designated sites were assessed based on predicted annual average airborne concentrations of oxides of nitrogen (NO_x) and ammonia (NH₃), as well as annual deposition of nutrient nitrogen and acid. Predicted pollutant contributions associated with the proposed development in the Havant DM (for consideration of the HBLP in isolation) and in the PUSH DM (for consideration of the HBLP in-combination) scenarios were compared to pollutant screening thresholds.

This Air Quality HRA indicates that, pre-mitigation, there will be no threat to the ability of these European sites to achieve their conservation objectives or maintain their integrity as a result of the Havant Borough Local Plan (either alone or in combination).

- *Chichester and Langstone Harbours Ramsar & SPA*

The emerging HBLP has the potential, pre-mitigation, to result in adverse air quality impacts for one European designated site:

- *Solent Maritime SAC*

With the application of the mitigation advocated above, adverse effects on the qualifying features of the Solent Maritime SAC can be prevented and as such there will be no threat to the ability of the European site to achieve its conservation objectives or maintain its integrity as a result of the Havant Borough Local Plan (either alone or in combination).”

¹³ <https://cdn.havant.gov.uk/public/documents/Air%20Quality%20Habitat%20Regulations%20Assessment.pdf>

3. METHODOLOGY

3.1 Consultation

Full details of the AQA approach were sent via email to HBC's Environmental Health department in February 2022 with a request for further comment / guidance. At the time of writing, no response had been received. As such, the assessment has been prepared in accordance with applicable best practice guidance as detailed below.

3.2 Guidance

The following guidance has been used to undertake this Air Quality Assessment:

- Defra's LAQM.TG (16)¹⁴;
- EPUK & IAQM Land-use Planning & Development Control: Planning for Air Quality¹⁵;
- The IAQM's guidance on assessing impacts from construction¹⁶; and
- Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites¹⁷.

3.3 Baseline Air Quality

The baseline air quality conditions in the vicinity of the Site have been established through the compilation and review of the following sources. The Baseline Assessment can be found in Section 4.

- Data from the National Atmospheric Emissions Inventory (NAEI)¹⁸, Environment Agency (EA)¹⁹ and Defra's Pollutant Release and Transfer Register (PRTR) data²⁰;
- Defra's 2019-2023 modelled background concentrations of AQS pollutants (UK-AIR)²¹. These estimates are produced using detailed modelling tools and are available as concentrations at central 1km² National Grid square locations across the UK, and;
- HBC's air quality monitoring data, derived from the latest available air quality annual status report (ASR) published in 2019²² - *At the time of writing, these data were from 2018 (which provides a robust assessment, as data do not include any uncertainties associated with changes in travel behaviour as a result of the COVID-19 pandemic)*;
 - » Note that more recent data was requested from HBC, as it is not in the public domain. At the time of writing, no response had been received.

¹⁴ Defra, "LAQM Technical Guidance LAQM.TG16" (Department for Food, Environment and Rural Affairs (Defra), April 2021), <https://laqm.defra.gov.uk/documents/LAQM-TG16-April-21-v1.pdf>

¹⁵ EPUK & IAQM, "Land-Use Planning & Development Control: Planning for Air Quality" (Institute for Air Quality Management (IAQM), January 2017), <http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>.

¹⁶ IAQM, "Guidance on the Assessment of Dust from Demolition and Construction" (Institute of Air Quality Management (IAQM)), February 2014), <http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf>.

¹⁷ IAQM, "A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites" (Institute for Air Quality Management (IAQM), June 2019), <https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf>.

¹⁸ National Atmospheric Emissions Inventory, UK Emissions Interactive Map (beis.gov.uk).

¹⁹ <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory> Accessed February 2022

²⁰ UK Pollutant Release and Transfer Register (PRTR) <https://prtr.defra.gov.uk/map-search> accessed February 2022

²¹ UK-AIR, "Background Mapping Data for Local Authorities - 2018," n.d., <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>.

²² Havant Borough Council, 2019 Air Quality Annual Status Report, October 2019

[https://cdn.havant.gov.uk/public/documents/HBC_ASR1903v2%20Rpt.%20Main%20\[Amend%20inc.%20Apx\].pdf](https://cdn.havant.gov.uk/public/documents/HBC_ASR1903v2%20Rpt.%20Main%20[Amend%20inc.%20Apx].pdf)

3.4 Construction Phase Assessment

The construction dust risk assessment is provided in Section 5 and has been undertaken in line with IAQM guidance. This considers the risk of impacts during the construction phase in terms of nuisance dust, human health (PM₁₀ exposure) and ecological impacts.

With regard to ecological receptors, risk assessment should be taken where high-sensitivity receptors are located within 50m of a Site boundary. The Multi Agency Geographic Information for the Countryside (MAGIC) website, which incorporates Natural England's interactive maps²³, 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. The local area was screened for the following designations:

- RAMSAR;
- SSSI;
- SAC; and
- Special Protection Areas (SPA).

No receptors were identified within 50m of the Site boundary or Trackout route and therefore no further consideration of ecological receptors is required.

With regard to nuisance dust soiling and human health impacts, within distances of 20m of the Site boundary there is a high risk of dust impacts. Up to 100m from the construction site, there may still be a high risk, particularly if the receptor is downwind of the prevailing wind direction in relation to the dust source. At distances >100m up to 350m, the risk of impacts is low.

Sensitive receptors were identified within 350m of the site boundary. Based on the IAQM guidance residential dwellings, museums, car parks and car show rooms are indicative examples of high sensitivity receptors in relation to both dust soiling and health effects of PM₁₀. Indicative examples of medium sensitivity receptors include places of work, such as offices.

The IAQM guidance states that the potential dust emission magnitude from Demolition, Earthworks, Construction and Trackout should all be assessed individually. In addition, the sensitivity of the area to adverse dust impacts should also be defined.

The overall significance of the risk of adverse impacts during the construction phase can then be defined using the 'risk of impacts matrix' for each stage of the construction phase described above.

3.5 Operational Phase Assessment

3.5.1 Scope of Impact Assessment

The scope of assessment has been determined against the EPUK and IAQM's two stage checklist criteria¹⁵. The Stage 1 Criteria identifies whether a development requires an air quality assessment. As the proposals include more than 10 residential dwellings and more than 10 parking spaces, consideration of Stage 2 is required.

Stage 2 includes some criteria which are not directly relevant to the Proposed Development, such as those related to the realignment of roads within an AQMA, introduction of a new bus station and underground car parks. These have been excluded from this assessment and only relevant screening criteria have been included. The relevant

²³ Natural England and MAGIC partnership organisations., "Multi Agency Geographic Information for the Countryside.," 2020, <https://magic.defra.gov.uk/MagicMap.aspx>, accessed February 2022

checklist criteria shown in Table 3 identifies whether a detailed assessment of potential air quality impacts is required.

Table 3 – EPUK & IAQM detailed assessment criteria

Criteria	The development will:	Indicative criteria to proceed to a detailed AQA:
1	Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV - cars and small vans <3.5t gross vehicle weight)	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA - more than 500 AADT elsewhere.
2	Cause a significant change in Heavy Duty (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA - more than 100 AADT elsewhere.
3	Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts
4	Have one of more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. This includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO _x emission rate is less than 5mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situation where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emissions rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Discussion of operational phase impacts, including comparison of the Proposed Development to the Stage 2 criteria, is provided in Section 6 of this report.

4. BASELINE AIR QUALITY CONDITIONS

Baseline air quality conditions in the study area are established through compilation and review of appropriately sourced monitoring and modelling data.

4.1 Local Emission Sources

The main source of air pollution in the surrounding Site locale are vehicles using the local road network, predominantly the A3(M) and College Road to the east and west of the Site, respectively.

A review of the NAEI¹⁸, EA¹⁹ and Defra's PRTR²⁰ data indicates that there are no industrial pollution sources in the immediate vicinity of the Site that will influence the local air quality.

4.2 Defra Mapped Background Concentrations

Background pollutant concentration data on a 1km x 1km spatial resolution is provided by Defra through the UK-AIR website and is routinely used to support LAQM and AQAs.

Mapped background concentrations of NO₂, PM₁₀ and PM_{2.5} were downloaded for the grid squares containing the Site and operational phase road traffic emission receptors presented Table 4. Mapped background concentrations have been obtained based upon the 2018 base year DEFRA update (August 2020 publication)²⁴.

Background pollutant concentrations for 2019 (the pre Covid-19 year), 2022 (the current year) and for 2023 (the completed opening year of the Proposed Development) are displayed in Table 4.

Table 4 – Defra Mapped Background Concentrations

Grid Square (x,y)	Pollutant	AQAL (µg/m ³)	Annual Mean Concentration (µg/m ³)		
			2019	2022	2023
368500, 90500	NO ₂	40	14.6	13.1	12.7
	PM ₁₀	40	14.9	14.3	14.2
	PM _{2.5}	20	10.7	10.2	10.1

The data show that annual mean background concentrations of NO₂, PM₁₀ and PM_{2.5} at the Site and surrounding locale are well below the AQALs in all years presented.

Concentrations of all pollutants are predicted to decline incrementally each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles and strategies to reduce emissions across all sectors.

4.3 Air Quality Monitoring Data

4.3.1 Automatic Air Quality Monitoring

The UK Automatic Urban and Rural Network (AURN) is a countrywide network of air quality monitoring stations operated on behalf of the DEFRA. Monitoring data for AURN sites is available from the UK-Air website²⁵.

²⁴ Background mapping data for local authorities – <http://uk-air.defra.gov.uk/data/laqm-background-home>

²⁵ Automatic Urban and Rural Network (AURN) - Defra, UK, accessed February 2022

The closest AURN monitor to the Site is the Portsmouth AURN (NGR: x465695, y103666) located approximately 4.7km south west from the Site. Given the distance between the Portsmouth AURN and the Site, monitored concentrations at the Portsmouth AURN are not considered to be representative of the Site. Therefore, monitoring data has not been presented in this assessment.

HBC do not currently undertake any continuous air quality monitoring within their administrative area.

4.3.2 Passive Diffusion Tube Monitoring

Passive diffusion tube monitoring is currently undertaken by HBC at numerous locations throughout the Council's area as part of their commitment to LAQM. The diffusion tubes are located in areas which are deemed to require further assessment of NO₂ concentrations. The closest monitoring locations in relation to the Site are shown in Figure 2. Data for these are reported in in Table 5.

Table 5 – Passive Diffusion Tube Monitoring Results

Site ID	Site Name	Site Type	X	Y	Distance from Site (km)	Annual Mean NO ₂ Concentrations (µg/m ³)			
						2015	2016	2017	2018
25 (B)	Stakes Road	R	468479	107721	0.5 – NW	22.4	24.4	24.1	26.8
S9	St. Peter's Primary Sch. (Prayer Garden)	O	468861	108173	0.8 – N	-	-	-	19.3*
T3	Bedhampton Hill	SU	469564	106136	1.1 – SE	-	-	-	22.9*
S10	St. Peter's Primary Sch. (Car Park)	O	467719	108195	1.5 – NW	-	-	-	21.8*
S7	Barncroft (Car Park)	O	470483	107531	1.4 – E	-	-	-	31.6*
S8	Barncroft (Woodland)	O	470608	107457	1.5 – E	-	-	-	19.6*

Notes: **Bold** values denote exceedance of the Annual Mean AQAL.
R = Roadside, O = Other, SU = Suburban
* Data capture was less than 75% and therefore in accordance with LAQM.TG(16) results should be treated with caution as pollution episodes may have been missed.

The data in Table 5 shows there have been no exceedances of the NO₂ annual mean AQAL during the period 2015 to 2018. Moreover, concentrations are less than 60µg/m³ and therefore exceedances of the short-term objective⁶ are considered unlikely. However, it should be noted that the data capture in 2018 at all sites except 25(B) had very low data capture and therefore results should be treated with caution.

The closest diffusion tube to the Site is 25(B) situated approximately 500m north west, at the Purbrook Way / Stakes Hill Road junction. Measured concentrations at this location are below the annual mean NO₂ AQAL during recent years.

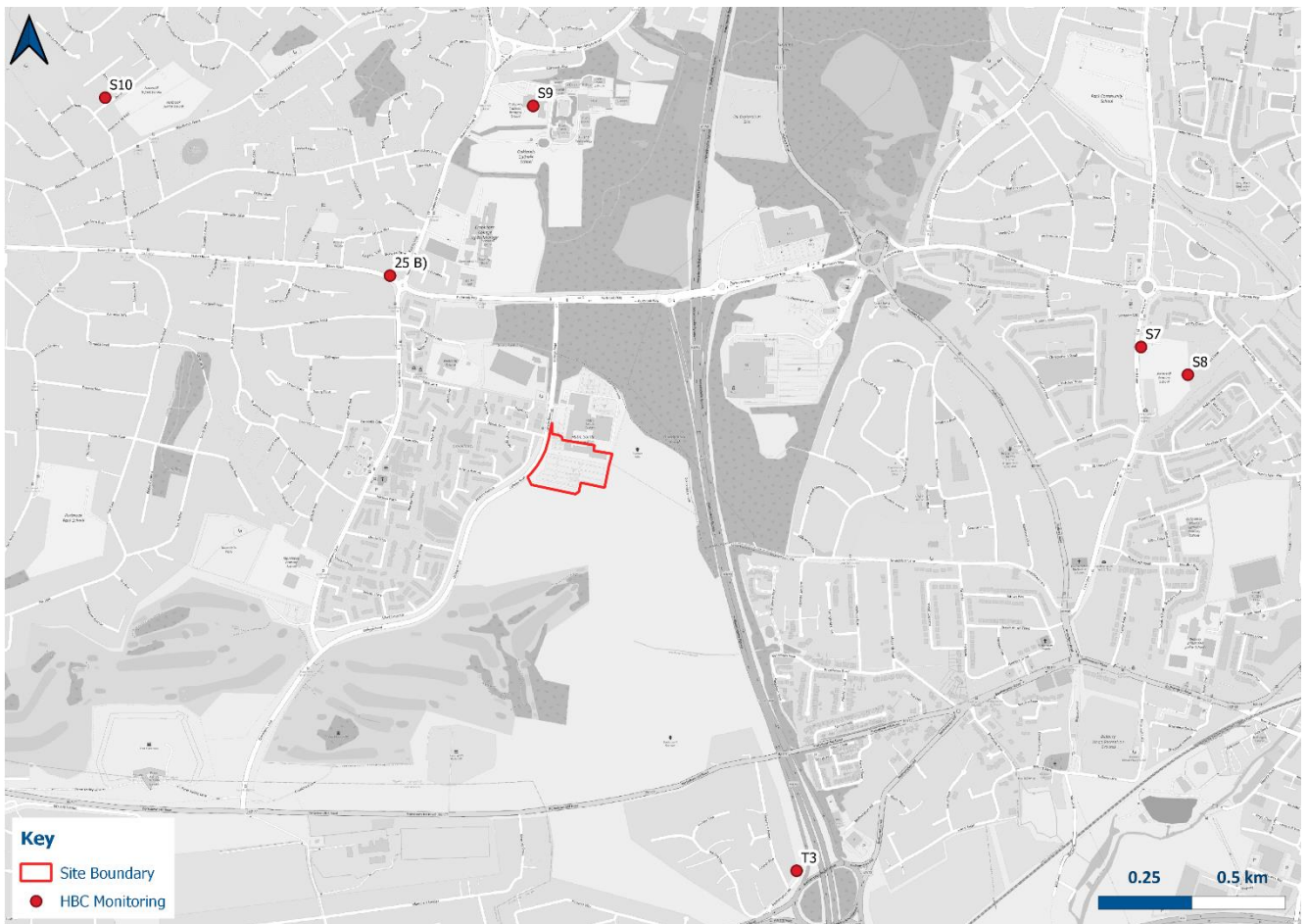


Figure 2 – Local Monitoring Sites

5. CONSTRUCTION PHASE ASSESSMENT

5.1 Overview

The construction phase of the Proposed Development will involve a number of activities that will release polluting emissions to air. Predominantly, these will be emissions of dust. As such, a qualitative construction dust risk assessment has been carried out in accordance with IAQM Guidance.

Construction activities will include:

- material export and import;
- temporary stockpiling of materials;
- groundwork for foundations and services;
- construction of buildings;
- landscaping works; and
- vehicle movements (with the potential to track-out material from site).

The risks of impact and the significance of each stage of the construction phase is classified as Negligible, Low, Medium or High, determined against a matrix which considers the distance from source, receptor sensitivity, background pollution concentrations and the potential dust emission magnitude of the works.

5.2 Construction Traffic Emissions

The IAQM's guidance states that, from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse impacts on local air quality would be caused and in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have not been assessed, as they are also likely to be well below the IAQM traffic criteria outlined in Table 3.

5.3 Dust Emission Magnitude

5.3.1 Demolition

The Site is predominantly occupied by an existing car park, however there are two college buildings (South Building and South East Building) which currently occupy the north eastern area of the Site. It is understood that these buildings will be demolished as part of the development proposals.

The total volume of buildings / infrastructure, to be demolished is anticipated to fall in IAQM's 'Small' threshold <20,000m². Construction materials are likely to comprise concrete and brick. Demolition activities are anticipated to take place below 10m above ground level.

Based on the above, the potential dust emission magnitude for demolition is considered to be '**Small**'.

5.3.2 Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. The total area of the Site is within the IAQM's 'Large' criteria (>10,000m²). The underlying soil texture is loamy with some clayey soils²⁶ which have a reasonably high potential for dust release when due to the small particle size.

²⁶ Cranfield University, "Cranfield Soil and Agrifood Institute," n.d., <http://www.landis.org.uk/soilscapes/>. accessed February 2022

Based on the above, the potential dust emission magnitude for earthworks is considered to be '**Large**'.

5.3.3 Construction

The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. An estimation of the total volume of the building to be constructed has been estimated based on the Masterplan layout of the Proposed Development.

The total volume was estimated to be within the IAQM's Medium category (25,000m³ – 100,000m³), with construction materials including traditional build, brick and block artificial slate. Furthermore, no on site concrete batching or sandblasting will be required.

Based on the above, the potential dust emission magnitude for construction is considered to be '**Medium**'.

5.3.4 Trackout

The risk of impacts occurring during Trackout is predominantly dependent on the number of vehicles accessing the Site on a daily basis. However, vehicle size, speed and the duration of activities are also factors which are used to determine the risk of impacts.

It is expected that there would be no more than 10 – 50 HDVs outwards movements from the Site each day. No unpaved surfaces over 50m would be utilised as site traffic would be routed along the existing road network.

Based on the above, the potential dust emission magnitude during Trackout is considered to be '**Medium**'.

5.3.5 Summary

Table 6 below shows a summary of the potential dust emission magnitudes from each activity:

Table 6 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Medium
Trackout	Medium

5.4 Sensitivity of Area

The prevailing wind direction for the closest regionally representative meteorological measurement station to the Site, at Thorney Island, for 2016 to 2020 is shown in Appendix A. The wind rose shows that the prevailing winds are from the south-west. As such, receptors downwind (i.e. north-east) of the Site are more at risk of dust impacts than those located upwind.

5.4.1 Dust Soiling Impacts

Figure 3 shows the construction phase distance buffers (20m, 50m, 100m and 350m) for the Site boundary, as well as identified high sensitivity receptor locations within these buffers.

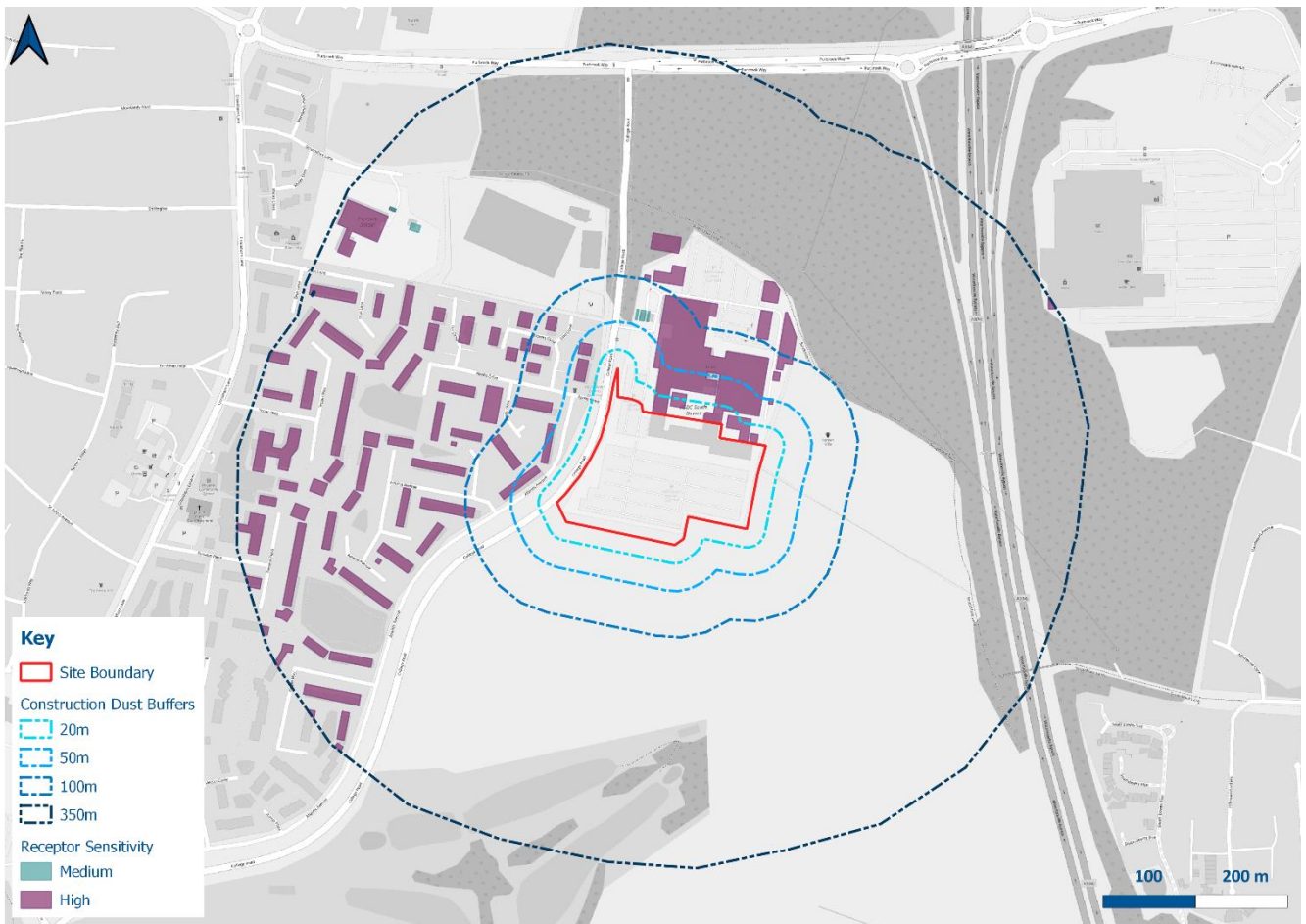


Figure 3 – Construction Phase Receptors

As shown in Figure 3, there are over 10 high sensitivity human receptors within 20m of the Site boundary. As such, the overall sensitivity of the surrounding area to nuisance dust soiling effects during Demolition, Earthworks and Construction, according to IAQM guidance, is defined as ‘High’.

With regard to Trackout, the sensitivity for Medium size sites is assessed where receptors are located within 50m from Trackout routes up to 200m from the Site. As there are more than 10 high-sensitivity receptors within 20m of potential Trackout routes from the Site, the sensitivity to dust soiling impacts from Trackout is defined as ‘High’.

5.4.2 Human Health Impacts

Defra mapped background predictions (Table 4) show that annual mean concentrations of PM₁₀ are well below 32µg/m³ in the vicinity of the Site²⁷ and are not likely to exceed 24µg/m³, based on 2019 estimates. According to IAQM guidance, where PM₁₀ concentrations are <24µg/m³ and there are fewer than 100 high sensitivity receptors within 20m of the Site boundary, the overall sensitivity of the surrounding area to human health impacts is defined as ‘Low’ for all stages.

5.4.3 Ecological Impacts

There are no ecological receptors within 50m of the Site Boundary and therefore the impact of dust on ecological receptors has not been considered further.

²⁷ The concentration at which exceedance of the 24-hour AQAL is likely

5.4.4 Summary

The sensitivity of the surrounding area for the potential impacts discussed above are shown in Table 7 below.

Table 7 - Sensitivity of Local Area

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

5.5 Risk of Impacts

Using the methodology prescribed in the IAQM guidance, the overall risk of impacts can be defined by combining the sensitivity of the area with the potential dust emission magnitude of each stage of the construction phase as described above.

Table 8 provides a summary of the construction dust risk assessment. Overall, the development is considered to be **High Risk** for nuisance dust soiling effects and **Low Risk** PM₁₀ health effects, in the absence of mitigation.

Table 8 - Risk of adverse impacts during construction phase

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	High Risk	Medium Risk	Medium Risk
Human Health	Negligible	Low Risk	Low Risk	Low Risk

Section 7.1 provides site specific mitigation measures to be adopted. The IAQM guidance states that implementing these measures should effectively reduce the risk of impacts to *Negligible* during this phase. On this basis, the residual construction phase effects are considered to be 'not significant'

6. OPERATIONAL PHASE ASSESSMENT

6.1 Impact Assessment

6.1.1 Vehicle Trip Generation

With reference to EPUK & IAQM Stage 2 screening criteria 1 and 2 (Table 3), the appointed transport consultants (AWP) have estimated under a very robust assessment that the Proposed Development will generate **434 AADT**. As such, the development generated traffic is below the EPUK & IAQM screening thresholds for detailed assessment and no further assessment has been undertaken.

In addition to the above, IAQM guidance¹⁷ provides an initial traffic screening threshold of 1,000 AADT to determine the need for further detailed assessment of air quality impacts at sensitive ecological receptor locations. The Proposed Development trip generation is well below this threshold.

Coupled with the conclusions of the HRA¹³, which demonstrated no significant impacts on designated ecological sites with the emerging HBC Local Plan, no further assessment of ecological receptors is considered to be necessary.

6.1.2 Junction Alterations

Whilst the Proposed Development will introduce a new junction (mini roundabout) on College Road, it is considered unlikely that vehicle speeds will change significantly given the current speed restrictions (30mph) and existing T-junction.

6.1.3 Energy Strategy

At the time of writing, the proposed energy strategy for the residential units was unknown. However, to avoid significant impacts mitigation measures are provided in Section 7.2. On this basis, emissions from combustion plant have not been considered further within this assessment.

6.2 Exposure Assessment

6.2.1 Traffic Data Review

Traffic data for the roads surrounding the Site have been provided by AWP, with 2022 flows presented in Table 9 below. This data is based on Automated Traffic Count (ATC) surveys undertaken in March 2022.

Table 9 - Review of Traffic Data

Road Link	2022 AADT
College Road (N of Apollo Drive)	3945
College Road (S of Apollo Drive)	2815
Apollo Drive	477

Table 9 shows that traffic flows on the roads bordering the Site are less than 10,000 vehicles per day and in accordance with LAQM.TG(16) criteria, these roads are not considered 'busy'.

There is a known relationship between NO₂ concentrations and distance to source, whereby concentrations reduce ('fall-off') as distances increase. LAQM.TG(16) suggests that the influence of emissions from roads with less than 10,000 vehicles per day is greatest within 10m of the kerb.

There are no sensitive receptors proposed within 10m of the roads bordering the Site, the closest receptor is situated approximately 25m, and as such NO₂ concentrations at locations of relevant exposure are likely to be comparable to those expected at urban background sites.

6.2.2 *Summary of Baseline Conditions*

The data provided in Section 4 showed that:

- the Site is not located within an AQMA;
- Annual mean background concentrations of NO₂, PM₁₀ and PM_{2.5} at the grid square within which the Site is located show that in all years, concentrations are below the AQALs with a forecasted declining trend;
- Local monitoring data, at the diffusion tubes closest to the Site were below the annual mean NO₂ AQAL in 2018; and
- Exceedances of the 1-hour mean NO₂ and 24-hour mean PM₁₀ AQAL are considered unlikely.

6.3 *Determination of Site Suitability*

From the evidence presented in this section, it is concluded that the risk of exceedance of the annual mean AQAL for NO₂ and other pollutants at the Site is low, and future residents of the Proposed Development will not be introduced to an area of existing poor air quality.

With regard to the potential impact on existing receptors, mitigation measures are discussed further in Section 7.

7. MITIGATION MEASURES

7.1 Construction Phase

The qualitative construction dust risk assessment shows that the Site is **High Risk** for adverse impacts during construction, as a worst-case, in the absence of mitigation. The IAQM's highly recommended mitigation measures for High-risk sites is provided at Appendix B of this report. Implementing these measures should effectively reduce the risks of construction phase impacts on the local area to Negligible.

7.2 Operational Phase

7.2.1 *Electric Vehicle Charging Infrastructure*

Electric Vehicle Charging Infrastructure will be provided across the Site at a rate of provision compliant with applicable policy as a minimum. It should be noted that in November 2021, the UK government announced its vision to put in place a regulatory framework for electric vehicle charging which supports a nationwide network of reliable, accessible and easy-to-use infrastructure. As part of this vision, it was announced that the following measures would be a legal requirement from 2022²⁸:

- New residential dwellings, including those created from a change of use, with associated parking within the Site boundary to have an electric vehicle charge point; and,
- All new non-residential buildings, with more than 10 parking spaces within the Site boundary of the building, to have a minimum of one charge point and in addition to this, cable routes for one in five of the total number of spaces.

7.2.2 *Framework Travel Plan Measures*

While no mitigation is considered to be required specifically to reduce the significance of impacts, it is noted that a Framework Travel Plan (FTP) is being prepared by AWP, which contains measures considered to be mutually beneficial for both transport and air quality. The key measures are summarised below:

- Appoint a travel plan co-ordinator;
- Design of the layout to minimise vehicle speeds and promote the dominance of pedestrian and cycle movements;
- Implementation of a high-quality walking route through the site to provide a connection to existing infrastructure on College Road;
- Secure cycle parking provided within the development;
- Set up a community web-site providing an outlet for the promotional strategy;
- Distribute travel information packs to each household upon occupation, providing detail on all potential sustainable travel opportunities, key contacts, and promotion of free mobile phone health applications;
- Liaise with Travel Plan Coordinators at local schools and employers to facilitate cross-promotion of relevant measures;
- Coordinate with schools to organise 'walk to school' events; and,

²⁸ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1040254/consultation-response-electric-vehicle-charging-in-residential-and-non-residential-buildings.pdf

- Liaise with local cycle shops and public transport operators to query whether discounted equipment and services can be arranged for local residents.

7.3 Ventilation Strategy

It is understood that natural ventilation is the proposed ventilation strategy for the Site. This is considered appropriate based on the results of the AQA.

7.4 Combustion Sources

The proposed energy strategy was unknown at the time of writing. Adopting renewable energy solutions would be the preferable option to avoid air quality impacts from combustion plant. However, if boilers are considered they should meet the IAQM¹⁶ minimum standard of <40mgNO_x/kWh.

8. DISCUSSION AND CONCLUSION

Hydrock have been commissioned by Places for People to prepare an AQA to support the planning application for residential dwellings (the 'Proposed Development'), at Havant and South Downs College.

Existing baseline air quality at the Site and surrounding area has been determined by reviewing UK-AIR background concentrations and local air quality monitoring data. UK-AIR modelled background concentrations of NO₂, PM₁₀ and PM_{2.5} at the Site and surrounding area are below the key AQALs with a declining trend in future years. Monitored concentrations of NO₂ have not exceeded the annual mean AQAL at the three closest diffusion tube locations in recent years.

A qualitative construction dust risk assessment has been undertaken in line with IAQM guidance. Through good practice and implementation of appropriate mitigation measures outlined, it is expected that the release of dust would be effectively controlled and mitigated, with resulting effects considered to be 'not significant'. All dust impacts are considered to be temporary and short-term in nature.

By following screening criteria provided in EPUK & IAQM guidance, the need for detailed dispersion modelling to assess the significance of potential impacts has been scoped out of this assessment, as vehicle traffic movements associated with the Site are not expected to trigger the indicative criteria for assessment. As such, it is not anticipated that any significant impacts on local air quality will occur and the Proposed Development is considered to be compliant with the NPPF and HBC Planning Policies.

A qualitative exposure assessment has also been undertaken. This shows that the Site is considered to be acceptable for residential use.

While no assessment of off-site impacts has been undertaken the Proposed Development will provide electric vehicle charging infrastructure, and is well connected to the local public transport network and pedestrian and cycle routes.

From the evidence presented, and by following the guidance provided herein, the Proposed Development will comply with all relevant air quality policy. As such, air quality should not pose any significant obstacles to the planning process.

Appendix A – Meteorological data

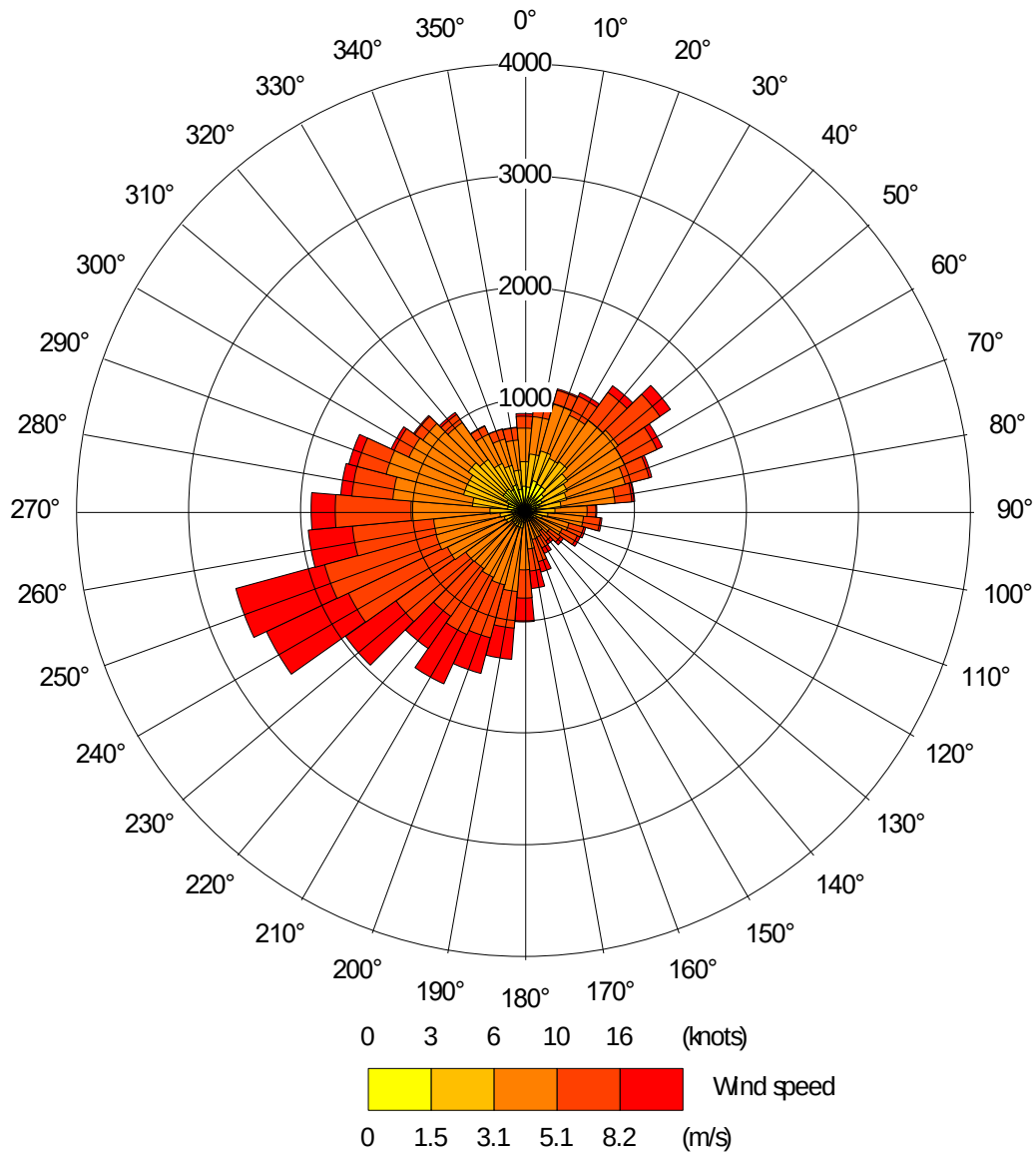


Figure 4 – Thorney Island Windrose (2016 – 2020)

Appendix B - Construction Dust Mitigation for High-Risk sites

In order to mitigate the worst-case dust impacts the following mitigation measures are highly recommended by the IAQM for High-Risk construction sites.

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.
- Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network route

Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
- 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 a large site, before work on a phase commences. Further guidance is provided by 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 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.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate)

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

- No bonfires and burning of waste materials.

Demolition

- Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).

- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment. Additionally, 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.

Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.

Construction

- Avoid scabbling (roughening of concrete surfaces) if possible
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

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 to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.