



# Land to the North East of KGV Playing Fields, Cuffley

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Air Quality Assessment  
June 2015

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Lands Improvement



**Proposed Residential Development  
Land to the north east of King George V Playing Field,  
Cuffley**

**Air Quality Assessment**



Lands Improvement

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## Executive Summary

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This report considers the air quality of the proposed Site at land to the north east of King George V Playing Field, Cuffley, and the effect on air quality that this proposed development is predicted to have on its surrounding area. The contents of this report have been informed through consultation with Welwyn Hatfield Borough Council and predicted future traffic levels used in this report are taken from the Transport Assessment.

An assessment of the potential effects on air quality during the construction phase of this development has been carried out. The main potential for dust nuisance is expected to arise during this construction phase due to earthworks, construction and trackout. The impact of dust from the Site can be reduced through good site practice and implementing mitigation methods detailed in this report, for example sheeting and the use of dust suppression tools.

To quantify the impact of the traffic generated by the proposed development on affected sensitive receptors, dispersion modelling has been undertaken using the ADMS-Roads model (Version 3.2). Using predicted traffic flow data and local meteorological information, it predicts potential pollution concentrations at sensitive receptors in close proximity of the considered road links.

Nitrogen dioxide concentrations measured near the area are well within the air quality objective levels and any increase due to traffic from the proposed development is predicted to be of negligible significance. The predicted development impacts on levels of particulate matter, PM<sub>10</sub> concentrations, are 'imperceptible' and therefore of negligible significance at all identified sensitive receptors. In terms of emissions, the number of construction vehicles is not expected to be significant when compared with the baseline traffic flows.

The maximum odour impact of the nearby proposed composting and anaerobic digestion plant has been considered and it is unlikely to affect the proposed Site as the odour levels are predicted to be within 'unrecognisable' levels.

When mitigation measures are implemented during the construction period, the impact of dust and PM<sub>10</sub> releases off-site are considered to be negligible. No specific mitigation measures are required during the operational stage of the development due to the negligible impact of the Site. Due to these resultant negligible impacts, air quality is not a constraint for this proposed development.

## 1 Introduction

- 1.1 Brookbanks Consulting Ltd was commissioned by Lands Improvement to undertake an air quality assessment for a proposed residential development at Cuffley. The Site location is identified in Figure 1.1. The Site does not lie within an Air Quality Management Area (AQMA).

### *Description of the Site*

- 1.2 The Site is located to the south of Cuffley, is 4.8ha in size and is currently in agricultural use. It is bound by existing residential development to the north and north-west; the grounds of Cuffley Primary School also adjoin the Site along its northern boundary. The railway line and Northaw Road East (B156) form strong eastern and western boundaries respectively. The southern boundary is defined by a mature hedgerow and tree belt lining the Hertfordshire Way footpath. Beyond the footpath to the south west of the Site is King George V Playing Field, which contains three sports pavilions, a recreation area with hard surfaced Multi Use Games Areas (MUGA), sports pitches and a small area of formal play equipment.
- 1.3 The Site also includes a 0.63ha rectangular parcel of land, in agricultural use, which is located to the south west of King George V Playing Field. Northaw Road East forms the western boundary of the land, beyond which lies a small number of residential properties and buildings associated with agricultural use. Further agricultural land lies to the south whilst tennis courts, sports pavilions and a bowling green are located to the north east and south east of the Site.

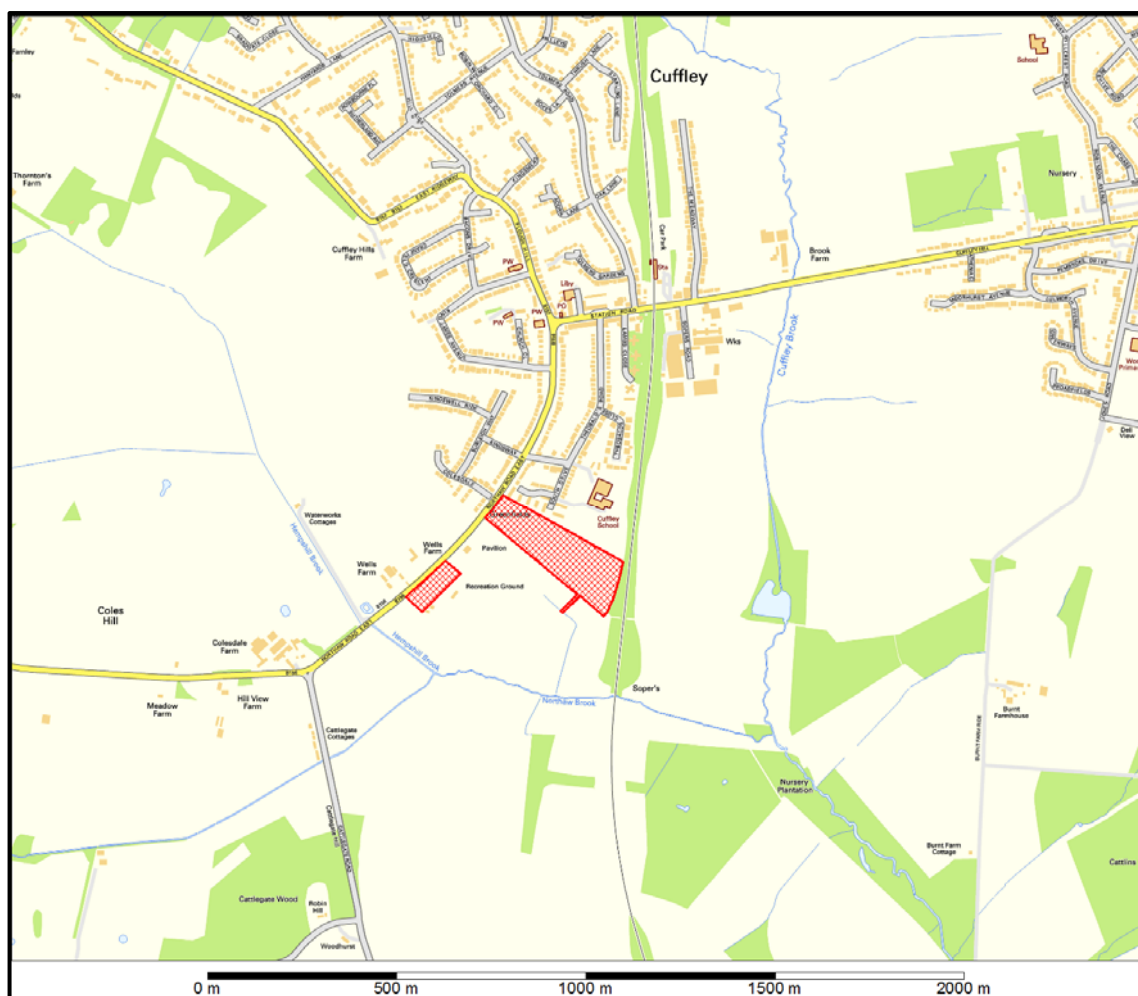


Figure 1.1: Site Location (Contains OS Data Copyright 2014)



### *Description of the Development*

- 1.4 The proposed development is to comprise: *“Residential development of up to 121 dwellings, associated infrastructure and a change in use from agricultural land to an extension of the King George V playing fields. All matters reserved except for new vehicular access to serve the site, the provision of surface water discharge points and the levels of the development platforms.”*

### *Purpose of This Assessment*

- 1.5 This report presents the findings of a detailed air quality assessment of the potential impacts of the proposed development on local air quality during both construction and operational phases. For both phases the type, source and significance of potential impacts are identified and the measures that should be employed to minimise these impacts are described.
- 1.6 An anaerobic digestion plant and composting facility has been proposed to the south of the proposed development. A qualitative assessment of the potential impact of the facility on future residents of the proposed development has also been undertaken.
- 1.7 A glossary of common air quality terminology is provided in Appendix A.

## **2 Legislation and Policy**

### *Air Quality Strategy for England, Scotland, Wales & Northern Ireland*

- 2.1 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007, pursuant to the requirements of Part IV of the Environment Act 1995<sup>1</sup>. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.
- 2.2 The AQS sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems. These are benzene (C<sub>6</sub>H<sub>6</sub>), 1,3-butadiene (C<sub>4</sub>H<sub>6</sub>), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>), sulphur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>) and polycyclic aromatic hydrocarbons (PAHs).
- 2.3 The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.
- 2.4 The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedences of the standard over a given period.
- 2.5 For some pollutants there is both a long-term (annual mean) standard and a short-term standard. In the case of nitrogen dioxide (NO<sub>2</sub>), the short-term standard is for a 1-hour averaging period, whereas for fine particulates (PM<sub>10</sub>) it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants (e.g. temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road).

<sup>1</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (July 2007)





- 2.6 Of the pollutants included in the AQS, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> will be particularly relevant to this project, as these are the primary pollutants associated with road traffic. A summary of the air quality standards for these pollutants is presented in Appendix B.

#### **Local Air Quality Management**

- 2.7 Part IV of the Environment Act 1995 also requires local authorities to periodically Review and Assess the quality of air within their administrative area. The Reviews have to consider the present and future air quality and whether any air quality objectives prescribed in Regulations are being achieved or are likely to be achieved in the future.
- 2.8 Where any of the prescribed air quality objectives are not likely to be achieved the authority concerned must designate that part an Air Quality Management Area (AQMA).
- 2.9 For each AQMA, the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the air quality objectives. Local authorities are not statutorily obliged to meet the objectives, but they must show that they are working towards them.
- 2.10 The Department of Environment, Food and Rural Affairs (DEFRA) has published technical guidance for use by local authorities in their Review and Assessment work<sup>2</sup>. This guidance, referred to in this chapter as LAQM. TG(09), has been used where appropriate in the assessment.

#### **National Planning Policy Framework (NPPF)**

- 2.11 Published on 27th March 2012, the National Planning Policy Framework (NPPF)<sup>3</sup> sets out the Government's planning policies for England and how these are expected to be applied. It replaces Planning Policy Statement 23: Planning and Pollution Control<sup>4</sup>, which provided planning guidance for local authorities with regards to air quality.
- 2.12 At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the Framework with the objective of contributing to the achievement of sustainable development.
- 2.13 Current planning law requires that application for planning permissions must be determined in accordance with the relevant development plan (i.e. Local Plan or Neighbourhood Plan). The NPPF should be taken into account in the preparation of development plans and therefore the policies set out within the Framework are a material consideration in planning decisions.
- 2.14 The NPPF identifies 12 core planning principles that should underpin both plan-making and decision-taking, including a requirement for planning to '*contribute to conserving and enhancing the natural environment and reducing pollution*'.
- 2.15 Under Policy 11: Conserving and Enhancing the Natural Environment the Framework requires the planning system to '*prevent both new and existing developments from contributing to or being put at unacceptable risk or being adversely affected by unacceptable levels of air pollution*'.
- 2.16 In dealing specifically with air quality the Framework states that '*planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions*

<sup>2</sup> Department for Environment, Food and Rural Affairs (DEFRA), (2009): Part IV The Environment Act 1995 Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(09).

<sup>3</sup> Communities and Local Government: National Planning Policy Framework (March 2012)

<sup>4</sup> Office of the Deputy Prime Minister: Planning Policy Statement 23: Planning and Pollution Control (Oct 2004)



*should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'.*

#### **Control of Dust and Particulates Associated with Construction**

- 2.17 Section 79 of the Environmental Protection Act (1990) states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Statutory nuisance is defined as:
- *'Any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance', and*
  - *'any accumulation or deposit which is prejudicial to health or a nuisance'.*
- 2.18 Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.
- 2.19 In the context of the proposed development, the main potential for nuisance of this nature will arise during the construction phase – potential sources being the clearance, earthworks, construction and landscaping processes.
- 2.20 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist – 'nuisance' is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred. However, research has been undertaken by a number of parties to determine community responses to such impacts and correlate these to dust deposition rates.

#### **Local Planning Policy**

- 2.21 Local planning policy, as set out by Welwyn Hatfield Borough Council, is contained in the saved policies of District Plan 2005 as Policy R18: *'The Council will have regard to the potential effects of a development on local air quality when determining planning applications. Consideration will be given to both the operational characteristics of the development and to the traffic generated by it. Any development within areas designated as Air Quality Management Areas must have regard to guidelines for ensuring air quality is maintained at acceptable levels asset out in the Air Quality Strategy.'*

## **3 Methodology**

#### **Scope of the Assessment**

- 3.1 The scope of the assessment has been determined in the following way:
- Consultation with Terry Vincent at Welwyn Hatfield Borough Council (WHBC), who approved the proposed assessment methodology;
  - Review of air quality data for the area surrounding the Site and background pollutant maps; and
  - Review of the traffic flow data, which has been used as an input to the air quality modelling assessment.
- 3.2 There is the potential for impacts on local air quality during both the construction and operational phases of the proposed development. Details of the assessment methodology and the specific issues considered are provided below.



### *Construction Dust*

- 3.3 To assess the potential impacts associated with dust and PM<sub>10</sub> releases during the construction phase and to determine any necessary mitigation measures, an assessment based on the latest guidance from the Institute of Air Quality Management<sup>5</sup> has been undertaken.
- 3.4 This approach divides construction activities into the following dust emission sources:
- demolition;
  - earthworks;
  - construction; and
  - trackout.
- 3.5 The risk of dust effects (low, medium or high) is determined by the scale (magnitude) and nature of the works and the proximity of sensitive human and ecological receptors.
- 3.6 The IAQM guidance recommends that an assessment be undertaken where there are sensitive human receptors:
- within 350 m of the Site boundary; or
  - within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance(s).
- 3.7 An assessment should also be carried out where there are dust-sensitive ecological receptors:
- within 50 m of the Site boundary; or
  - within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the Site entrance(s).
- 3.8 The significance of the dust effects is based on professional judgement, taking into account the sensitivity of receptors and existing air quality.
- 3.9 The magnitude of the dust impacts for each source is classified as Small, Medium or Large depending on the scale of the proposed works. Figure 3.1 summarises the IAQM criteria that may be used to determine the magnitude of the dust emission. These criteria are used in combination with site specific information and professional judgement.

<sup>5</sup> Guidance on the assessment of dust from demolition and construction, IAQM, February 2014

Source	Large	Medium	Small
<b>Demolition</b>	<ul style="list-style-type: none"> <li>Total building volume &gt;50,000m<sup>3</sup></li> <li>Potentially dusty material (e.g. concrete)</li> <li>Onsite crushing and screening</li> <li>Demolition activities &gt;20m above ground level.</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume 20,000 - 50,000m<sup>3</sup></li> <li>Potentially dusty material</li> <li>Demolition activities 10 - 20m above ground level.</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume &lt;20,000m<sup>3</sup></li> <li>Construction material with low potential for dust release</li> <li>Demolition activities &lt;10m above ground level</li> <li>Demolition during wetter months</li> </ul>
<b>Earthworks</b>	<ul style="list-style-type: none"> <li>Total site area &gt;10,000m<sup>2</sup></li> <li>Potentially dusty soil type (e.g. clay)</li> <li>&gt;10 heavy earth moving vehicles active at any one time</li> <li>Formation of bunds &gt;8m in height</li> <li>Total material moved &gt;100,000 tonnes</li> </ul>	<ul style="list-style-type: none"> <li>Total site area 2,500 - 10,000m<sup>2</sup></li> <li>Moderately dusty soil type (e.g. silt)</li> <li>5 - 10 heavy earth moving vehicles active at any one time</li> <li>Formation of bunds 4 - 8m in height</li> <li>Total material moved 20,000 - 100,000 tonnes</li> </ul>	<ul style="list-style-type: none"> <li>Total site area &lt;2,500m<sup>2</sup></li> <li>Soil type with large grain size (e.g. sand)</li> <li>&lt;5 heavy earth moving vehicles active at any one time</li> <li>Formation of bunds &lt;4m in height</li> <li>Total material moved &lt;20,000 tonnes</li> <li>Earthworks during wetter months</li> </ul>
<b>Construction</b>	<ul style="list-style-type: none"> <li>Total building volume &gt;100,000m<sup>3</sup></li> <li>On site concrete batching</li> <li>Sandblasting</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume 25,000 - 100,000m<sup>3</sup></li> <li>Potentially dusty construction material (e.g. concrete)</li> <li>On site concrete batching</li> </ul>	<ul style="list-style-type: none"> <li>Total building volume &lt;25,000m<sup>3</sup></li> <li>Material with low potential for dust release (e.g. metal cladding or timber)</li> </ul>
<b>Trackout</b>	<ul style="list-style-type: none"> <li>&gt;50 HDV movements in any one day (a)</li> <li>Potentially dusty surface material (e.g. high clay content)</li> <li>Unpaved road length &gt;100m</li> </ul>	<ul style="list-style-type: none"> <li>10 - 50 HDV movements in any one day (a)</li> <li>Moderately dusty surface material (e.g. silt)</li> <li>Unpaved road length 50 - 100m</li> </ul>	<ul style="list-style-type: none"> <li>&lt;10 HDV movements in any one day (a)</li> <li>Surface material with low potential for dust release</li> <li>Unpaved road length &lt;50m</li> </ul>

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

**Figure 3.1:** Dust Emission Magnitude Criteria

- 3.10 Factors defining the sensitivity of a receptor are presented in Figure 3.2. The sensitivity of a receptor will also depend on a number of additional factors including any history of dust generating activities in the area, likely cumulative dust impacts from nearby construction sites, any pre-existing screening such as trees or buildings and the likely duration of the impacts. In addition, the influence of the prevailing wind direction and local topography may be of relevance when determining the sensitivity of a receptor.

Sensitivity	Human (Health)	Human (Dust Soiling)	Ecological
<b>High</b>	<ul style="list-style-type: none"> <li>Locations where members of the public are exposed over a time period relevant to the air quality objectives for PM<sub>10</sub> (a)</li> <li>Examples include residential dwellings, hospitals, schools and residential care homes.</li> </ul>	<ul style="list-style-type: none"> <li>Regular exposure</li> <li>High level of amenity expected.</li> <li>Appearance, aesthetics or value of the property would be affected by dust soiling.</li> <li>Examples include residential dwellings, museums, medium and long-term car parks and car showrooms.</li> </ul>	<ul style="list-style-type: none"> <li>Nationally or Internationally designated site with dust sensitive features (b)</li> <li>Locations with vascular species (c)</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>Locations where workers are exposed over a time period relevant to the air quality objectives for PM<sub>10</sub> (a)</li> <li>Examples include office and shop workers (d)</li> </ul>	<ul style="list-style-type: none"> <li>Short-term exposure</li> <li>Moderate level of amenity expected</li> <li>Possible diminished appearance or aesthetics of property due to dust soiling</li> <li>Examples include parks and places of work</li> </ul>	<ul style="list-style-type: none"> <li>Nationally designated site with dust sensitive features (b)</li> <li>Nationally designated site with a particularly important plant species where dust sensitivity is unknown</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>Transient human exposure</li> <li>Examples include public footpaths, playing fields, parks and shopping streets</li> </ul>	<ul style="list-style-type: none"> <li>Transient exposure</li> <li>Enjoyment of amenity not expected.</li> <li>Appearance and aesthetics of property unaffected</li> <li>Examples include playing fields, farmland (e), footpaths, short-term car parks and roads</li> </ul>	<ul style="list-style-type: none"> <li>Locally designated site with dust sensitive features (b)</li> </ul>

(a) In the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more in a day.

(b) Ecosystems that are particularly sensitive to dust deposition include lichens and acid heathland (for alkaline dust, such as concrete).

(c) Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

(d) Does not include workers exposure to PM<sub>10</sub> as protection is covered by Health and Safety at Work legislation.

(e) Except commercially sensitive horticulture.

**Figure 3.2:** Factors Defining the Sensitivity of a Receptor

- 3.11 The sensitivity of the area as a whole to dust soiling and health impacts is dependent on the number of receptors within each sensitivity class and their distance from the source. In addition, human health impacts are dependent on the existing PM<sub>10</sub> concentrations in the area. Figures 3.3 and 3.4 summarise the criteria for determining the overall sensitivity of the area to dust soiling and health impacts respectively. The sensitivity of the area to ecological impacts is presented in Figure 3.5.

Sensitivity	Number of Receptors	Distance from the Source			
		<20m	<50m	<100m	<350m
<b>High</b>	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
<b>Medium</b>	>1	Medium	Low	Low	Low
<b>Low</b>	>1	Low	Low	Low	Low

**Figure 3.3:** Sensitivity of the Area to Dust Soiling Effects on People and Property

Sensitivity	Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> )	Number of Receptors	Distance from the Source				
			<20m	<50m	<100m	<200m	<350m
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 - 28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1 - 10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Figure 3.4: Sensitivity of the Area to Human Health Impacts

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

Figure 3.5: Sensitivity of the Area to Ecological Impacts

- 3.12 For each dust emission source (demolition, construction, earthworks and trackout), the worst-case area sensitivity is used in combination with the dust emission magnitude to determine the risk of dust impacts. The risk of dust impacts prior to mitigation for each emission source is presented in Figures 3.6 and 3.7.

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Figure 3.6: Risk of Dust Impacts – Demolition, Earthworks and Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Figure 3.7: Risk of Dust Impacts - Trackout

- 3.13 The IAQM guidance provides a range of mitigation measures which are dependent on the level of dust risk attributed to the site. Site specific mitigation measures are also included where appropriate.
- 3.14 The significance of the impacts following appropriate mitigation is determined by professional judgement.

#### Construction Traffic

- 3.15 Construction traffic will contribute to existing traffic levels on the surrounding road network. The greatest potential for impacts on air quality from traffic associated with this phase of the proposed development will be in the areas immediately adjacent to the principal means of access for construction traffic.

- 3.16 Compared with baseline traffic flow, the number of vehicles associated with construction is not predicted to be significant in terms of total emissions or construction duration. Therefore construction traffic has not been considered further in this assessment.

#### Operational Traffic

- 3.17 Dispersion modelling has been carried out using the ADMS-Roads model (Version 3.2) to quantify the impact at sensitive receptors located close to the road links affected by the proposals.
- 3.18 ADMS-Roads, a version of the Atmospheric Dispersion Modelling System (ADMS), is a PC based model for simulating the dispersion in the atmosphere of pollutants released from industrial and road traffic sources in urban areas. The model simulates the dispersion of emissions using point, line, area and volume source models. It is designed to allow consideration of dispersion problems ranging from simple (e.g. a single isolated point source or a single road) to complex problems (e.g. multiple industrial and road traffic emissions over a large area).
- 3.19 The model uses detailed information regarding traffic flows on the local road network and local meteorological conditions to predict pollution concentrations at specific locations selected by the user. Meteorological data from the Heathrow Airport for 2012 has been used for the assessment.
- 3.20 A summary of the input parameters to the dispersion modelling assessment is presented in Appendix C. The following assessment scenarios have been considered:
- 2018 Baseline Traffic
  - 2018 Baseline + Development Traffic
- 3.21 The LAQM.TG(09), recommends that modelled concentrations should be within 25% of monitored concentrations, ideally within 10%. Where there is a large discrepancy between modelled and measured concentrations, it is considered necessary to adjust the model results to more accurately reflect local air quality. Unfortunately there are no monitoring sites in the vicinity of the proposed development, therefore low traffic speeds have been assumed in the assessment in order to provide as conservative an assessment of impacts as possible.
- 3.22 Predicted NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at receptor locations are compared with the air quality standards and objectives set for the protection of human health.

#### Significance Criteria

- 3.23 The significance of the predicted impacts is determined in accordance with the EPUK planning guidance in combination with the professional judgement of the author. The magnitude of an impact is classified as Large, Medium, Small or Imperceptible depending on the predicted change in the pollutant concentration compared with the relevant air quality standard or objective as illustrated in Figure 3.8.

Magnitude of Change	Annual Mean
Large	Increase/ decrease >10%
Medium	Increase/ decrease 5 – 10%
Small	Increase/ decrease 1 – 5%
Imperceptible	Increase/ decrease <1%

Figure 3.8: Definition of Impact Magnitude for Changes in Ambient Annual Mean Pollutant Concentrations.

- 3.24 The impact significance is dependent on the impact magnitude and the existing pollutant concentrations in the area as identified in Figure 3.9.

Absolute Concentration in Relation to Objective/ Limit Value	Change in Concentration		
	Small	Medium	Large
<b>Increase with Development</b>			
Above Objective/ Limit Value With Scheme (>EAL)	Minor Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/ Limit Value With Scheme (>90% of EAL)	Minor Adverse	Moderate Adverse	Moderate Adverse
Below Objective/ Limit Value With Scheme (75 - 90% of EAL)	Negligible	Minor Adverse	Minor Adverse
Well Below Objective/ Limit Value With Scheme (<75% EAL)	Negligible	Negligible	Minor Adverse
<b>Decrease with Development</b>			
Above Objective/ Limit Value Without Scheme (>EAL)	Minor Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/ Limit Value Without Scheme (>90% of EAL)	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/ Limit Value Without Scheme (75 - 90% of EAL)	Negligible	Minor Beneficial	Minor Beneficial
Well Below Objective/ Limit Value Without Scheme (<75% EAL)	Negligible	Negligible	Minor Beneficial
Above Objective/ Limit Value Without Scheme (>EAL)	Minor Beneficial	Moderate Beneficial	Substantial Beneficial

Figure 3.9: Air Quality Impact Significance Descriptors

- 3.25 Other factors taken into account in determining the significance of the impacts predicted are summarised in Figure 3.10 below.

Factors
<ul style="list-style-type: none"> <li>The number of properties affected by minor, moderate or major air quality impacts.</li> <li>The number of people exposed to levels above the objective or limit value.</li> <li>The magnitude of the changes and the description of the impacts at relevant receptors.</li> <li>Whether or not an exceedence of an objective or limit value is predicted to arise in the study area where none existed before, or an exceedence area is substantially increased.</li> <li>Whether or not the study area exceeds an objective or limit value and this exceedence is removed or the exceedence area is reduced.</li> <li>Uncertainty, including the extent to which worst-case assumptions have been made.</li> <li>The extent to which an objective or limit value is exceeded, e.g. an annual mean NO<sub>2</sub> of 41 µg/m<sup>3</sup> should attract less significance than an annual mean of 51 µg/m<sup>3</sup>.</li> </ul>

Figure 3.10: Factors Taken into Account in Determining Air Quality Significance

### Sensitive Receptors

- 3.26 LAQM.TG(09) describes in detail typical locations where consideration should be given to pollutants defined in the Regulations. Generally, the guidance suggests that all locations 'where members of the public are regularly present' should be considered. At such locations, members of the public will be exposed to pollution over the time that they are present, and the most suitable averaging period of the pollutant needs to be used for assessment purposes.
- 3.27 For instance, on a footpath, where exposure will be transient (for the duration of passage along that path) comparison with short-term standard (i.e. 15-minute mean or 1-hour mean) may be relevant. In a school, or adjacent to a private dwelling, however; where exposure may be for longer periods, comparison with long-term (such as 24-hour mean or annual mean) standards may be most appropriate. In general terms, concentrations associated with long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time.



- 3.28 For the completion of this assessment, consideration of the potential impacts of the proposed development on local air quality has been undertaken by predicting pollutant concentrations at receptors in close proximity to the road links considered.
- 3.29 Details of the receptor locations for the modelling assessment and their locations are presented in Figure 3.11 and Figure 3.12 respectively.

ID	Receptor	Type	Easting	Northing
1	1 Cattlegate Cottages	Residential	529813	201537
2	Colesdale Farm	Residential	529744	201772
3	Wells Farm	Residential	530048	201992
4	Tennis Courts	Residential	530164	202070
5	11 Colesdale	Residential	530252	202219
6	34 Northaw Road East	Residential	530383	202432
7	M. Thurlow and Co, Station Road	Commercial with Residential on 1 <sup>st</sup> Floor	530457	202703
8	10 Plough Hill	Residential	530388	202806

Figure 3.11: Sensitive Receptors



Figure 3.12: Sensitive Receptor Locations (Contains OS Data Copyright 2014)

#### Proposed Composting Facility and Anaerobic Digestion Plant

- 3.30 The location of the proposed green waste composting and anaerobic digestion (AD) plant at Cattlegate Farm in relation to the proposed development Site is presented in Figure 3.13.



**Figure 3.13:** Location of Proposed Composting and Anaerobic Digestion Plant

- 3.31 An Odour Impact Assessment<sup>6</sup> was prepared in support of the planning application for the AD Plant and Composting Facility. Dispersion modelling of the cumulative emissions from the two facilities has predicted a worst case odour impact of between 0.7 and 1.3 OU<sub>E</sub> at receptors in the vicinity of the proposed development (e.g. Cuffley School, tennis courts, Coleshill).
- 3.32 The Environment Agency has published horizontal odour guidance note H4 – Odour Management<sup>7</sup>, which proposes the use of exposure criteria (benchmarks) for different types of process on the basis that not all odours are equally offensive, and not all receptors are equally sensitive.
- 3.33 The H4 Technical Guidance notes that 5 OU<sub>E</sub>/m<sup>3</sup> would be a “faint” odour whilst 10 OU<sub>E</sub>/m<sup>3</sup> would be considered a “distinct” odour. Generally, an average person would be able to recognise the source of an odour at about 3 OU<sub>E</sub>/m<sup>3</sup> although this can depend on the relative offensiveness of the odour.
- 3.34 Since the maximum predicted odour impact in the vicinity of the proposed development is 1.3 OU<sub>E</sub>, it is considered unlikely that residents of the proposed development would be significantly affected by odour generated by the proposed composting or AD facilities.
- 3.35 The Environment Agency (EA) has confirmed that the proximity of the development Site to these proposed facilities would not be a basis for objection. The relevant correspondence from the EA is presented in Appendix D.

<sup>6</sup> Odour Impact Assessment for Proposed Anaerobic Digestion Plant and Proposed Green Waste Compost Operation at Cattlegate Farm, Cattlegate Road, Enfield, Middlesex, The Airshed (AS 0285 Cattlegate AD), July 2011.

<sup>7</sup> Environment Agency (March 2011), Horizontal Guidance Note H4, Odour Management



## 4 Baseline Conditions

### *Welwyn Hatfield Borough Council Review and Assessment of Air Quality*

- 4.1 WHBC carries out frequent review and assessments of air quality within the area and produces Updating and Screening Assessments and Progress Reports in accordance with the requirements of DEFRA.
- 4.2 Routine NO<sub>2</sub> monitoring carried out in the Borough indicates that there are currently no exceedences of the air quality objectives and no AQMAs have been declared.

### *Nitrogen Dioxide*

- 4.3 WHBC operates an automatic air quality monitoring station (AQMS) at the Council Offices (an urban background location) in Welwyn Garden City (WGC). The Site is affiliated to the Hertfordshire and Bedfordshire air quality network and is subject to high levels of quality assurance and control. Existing and historical NO<sub>2</sub> concentrations measured at this location are well within the short and long term air quality objectives.
- 4.4 WHBC also operates a network of passive diffusion tubes to monitor ambient NO<sub>2</sub> concentrations at sixteen locations across the Borough. The majority of the tubes are located in WGC and Hatfield; however there are two background tubes close to Cuffley, which may provide an indication of existing NO<sub>2</sub> concentrations in the vicinity of the proposed development Site. A summary of annual mean concentrations measured between 2009 and 2013 is presented in Figure 4.1. The location of the diffusion tubes in relation to the Site is presented in Figure 4.2.
- 4.5 The diffusion tube data have been bias adjusted using national adjustment from the Bias Adjustment Spreadsheet available on the DEFRA website<sup>8</sup>.

Site Name	Type	Easting	Northing	2009	2010	2011	2012	2013
Coopers Lane Road, Northaw (WH5)	Background	529402	200929	23.6	25.4	25.3	26.0	24.0
Bradgate, Cuffley (WH6)	Background	529933	203654	21.2	25.4	23.2	23.0	20.0

**Figure 4.1:** Summary of Annual Mean Background NO<sub>2</sub> Concentrations Measured by Diffusion Tube (Source: WHBC 2014 Air Quality Progress Report)

<sup>8</sup> <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

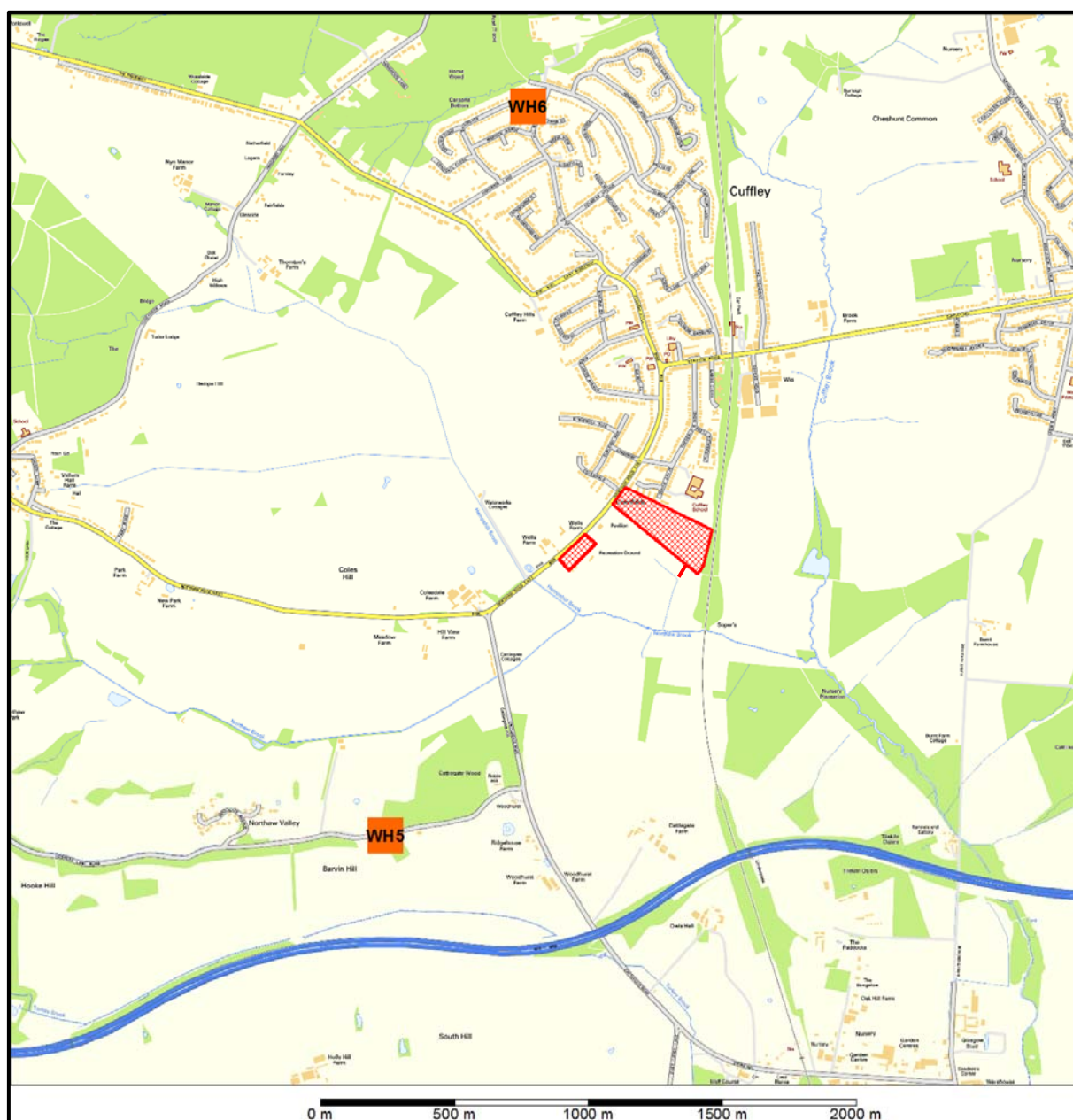


Figure 4.2: Diffusion Tube Locations (Contains OS Data Copyright 2014)

- 4.6 Annual mean NO<sub>2</sub> concentrations measured at the two background diffusion tubes in the vicinity of the proposed development are well within the air quality objective. Concentrations at WH5 are slightly higher than at WH6, which is likely to be due to the influence of the M25. The average concentration measured between 2009 and 2013 at WH6 was 24.9 µg/m<sup>3</sup>, 62% of the annual mean air quality objective of 40 µg/m<sup>3</sup>.
- 4.7 Whilst NO<sub>2</sub> concentrations measured at WH6 have declined since 2010, the trend at site WH5 is less clear. For the purposes of the assessment, the 2009 to 2013 average NO<sub>2</sub> concentration measured at WH5 is assumed to provide a reasonable estimate of the existing and future background concentration at the proposed development Site and nearby sensitive receptors. With the exception of 2010, where unusually high concentrations were recorded across the UK, the WH5 average concentration is higher than the annual mean concentrations measured at WH6 and is therefore considered to provide a conservative assessment of the total predicted concentrations (background plus traffic contribution) at sensitive receptor locations, which are over 1 km from the M25.

### Particulate Matter

- 4.8 WHBC do not currently undertake monitoring of ambient PM<sub>10</sub> or PM<sub>2.5</sub> concentrations, therefore 2014 DEFRA mapped background concentrations<sup>9</sup> have been utilised in the assessment. These 1 km grid resolution maps are derived from a complex modelling exercise that takes into account emissions inventories and measurements of ambient air pollution from both automated and non-automated sites.
- 4.9 The latest background maps for NO<sub>2</sub> were issued in June 2014 and are based on 2011 monitoring data. DEFRA guidance issued in conjunction with the new background maps<sup>10</sup> suggests that unusually high particulate concentrations were measured in 2011. A scaling factor of 0.91 is provided to adjust the mapped concentrations to more typical levels.
- 4.10 Contour plots of the mapped data have been used to determine the maximum concentration at the proposed development and nearby sensitive receptors. The 2014 mapped annual mean background PM<sub>10</sub> concentration at the proposed development is 17.6 µg/m<sup>3</sup>, 44% of the air quality objective of 40 µg/m<sup>3</sup>. For PM<sub>2.5</sub>, the mapped background concentration is 11.9 µg/m<sup>3</sup>, 48% of the EU limit value of 25 µg/m<sup>3</sup>. For the purposes of the assessment, the mapped 2014 background concentrations are assumed to provide a reasonable representation of the existing and future particulate concentrations in the vicinity of the proposed development.

## 5 Assessment of Impacts

### Construction Dust

- 5.1 The proposed development Site is situated on the southern side of Cuffley, adjacent to an existing residential area and sports facility. Cuffley Primary School is approximately 70 m from the site boundary.
- 5.2 The assessment of dust impacts is dependent on the proximity of the most sensitive receptors to the site boundary. A summary of the receptor and area sensitivity to health and dust soiling impacts is presented in Figure 5.1. The overall sensitivity of the area to dust soiling impacts is *high*, however due to the relatively low background PM<sub>10</sub> concentration the sensitivity of the area to human health impacts is *low*.

Receptor	Distance from Site Boundary	Number of Receptors	Sensitivity to Health Impacts (a)		Dust Soiling Sensitivity	
			Receptor	Area	Receptor	Area
Residential Properties	<20m	<20	High	Low	High	High
King George V Playing Fields	<20m	50 - 100	Low	Low	Medium	Medium
Cuffley School	70m	>100	High	Low	High	High
Overall Sensitivity of the Area			Low		High	
(a) Estimated Annual mean PM <sub>10</sub> concentration is 17.6 µg/m <sup>3</sup>						

**Figure 5.1:** Sensitivity of Receptors and the Local Area to Dust Impacts

- 5.3 The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited will depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

<sup>9</sup> <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011>

<sup>10</sup> <http://laqm.defra.gov.uk/documents/Background-maps-user-guide-v1.0.pdf>

- 5.4 A wind rose for Heathrow Airport is provided below in Figure 5.2, which shows that the prevailing wind is from the west and southwest, therefore receptors to the east and northeast of the Site are the most likely to experience dust impacts from the Site.

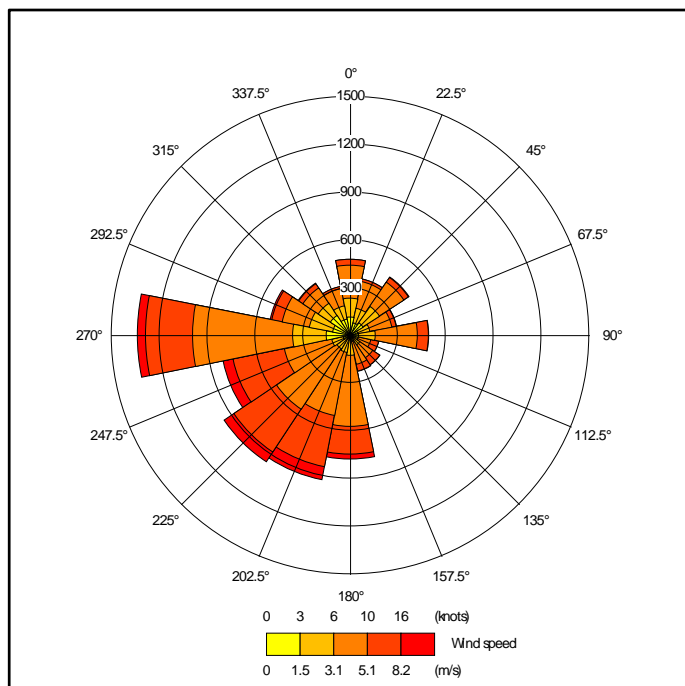


Figure 5.2: Wind Rose for Heathrow Airport (2012)

- 5.5 The proposed development Site is currently used for agricultural purposes. There are no existing structures on-site which will require demolition.
- 5.6 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling of the Site and landscaping. The Development Site covers an area of 4.89 ha and it is likely that there will be large numbers of earth moving vehicles on-site and the potential for long-term stockpiling of dusty materials. The magnitude of the dust emission for the earthworks phase is therefore considered to be *large*.
- 5.7 Dust emissions during construction will depend on the scale of the works, method of construction, construction materials and duration of build. The proposed development is currently at outline planning stage; therefore detailed information is unavailable regarding the method and duration of construction. For the purposes of the assessment, it has been assumed that the development will be of standard brick and concrete construction and there is potential for on-site concrete batching to be undertaken on-site. Given the large scale of the proposed development, the dust emission magnitude for construction is considered to be *large*.
- 5.8 Factors influencing the degree of trackout and associated magnitude of effect include vehicle size, vehicle speed, vehicle numbers, geology and duration. Construction traffic will access the site via Northaw Road East, where there are existing residential properties within 10m of the carriageway. Due to the relatively large size of the Site there is the potential for up to 50 HGV movements per day over potentially lengthy unpaved haul roads. The dust emission magnitude due to trackout is considered to be *large*.
- 5.9 A summary of the potential risk of dust impacts, based on the high overall sensitivity of the area to human health and dust soiling impacts, is presented in Figure 5.3. The significance of the dust impacts prior to mitigation is considered to be moderate adverse.



Source	Impact Magnitude	Human Health Risk	Dust Soiling Risk
Demolition	n/a	n/a	n/a
Earthworks	Large	Medium	High
Construction	Large	Medium	High
Trackout	Large	Low	High

Figure 5.3: Risk of Dust Impacts Prior to Mitigation

### Operational Traffic

- 5.10 Predicted annual mean NO<sub>2</sub> concentrations at the selected receptor locations are presented in Figure 5.4. The concentrations presented include the background NO<sub>2</sub> concentration of 24.9 µg/m<sup>3</sup>.

ID	Location	Baseline	Baseline + Development	Development Impact (% of AQO)	Significance
1	1 Cattlegate Cottages	26.1	26.2	0.075%	Negligible
2	Colesdale Farm	26.5	26.5	0.10%	Negligible
3	Wells Farm	27.9	28.0	0.25%	Negligible
4	Tennis Courts	27.8	27.9	0.23%	Negligible
5	11 Colesdale	26.9	26.9	0.23%	Negligible
6	34 Northaw Road East	27.2	27.2	0.23%	Negligible
7	M. Thurlow and Co, Station Road	30.2	30.4	0.48%	Negligible
8	10 Plough Hill	28.4	28.5	0.075%	Negligible

Figure 5.4: Predicted Annual Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>)

- 5.11 Predicted annual mean NO<sub>2</sub> concentrations are below the AQO of 40 µg/m<sup>3</sup> at all receptor locations. The increase in the predicted annual mean NO<sub>2</sub> concentration due to traffic associated with the proposed development is less than 1% of the air quality objective at all locations, therefore the impact is of negligible significance.
- 5.12 It can also be concluded that NO<sub>2</sub> concentrations at the land to the south west of the site with a proposed change of use to playing fields will be well below relevant air quality objectives.
- 5.13 Research has concluded<sup>11</sup> that exceedences of the 1-hour mean AQO may occur where annual mean concentrations are over 60 µg/m<sup>3</sup>. The predicted concentrations are less than 50% of this level at all receptor locations indicating that an exceedence of the short-term objective is extremely unlikely.
- 5.14 Predicted annual mean PM<sub>10</sub> concentrations at the selected receptor locations are presented in Figure 5.5. The concentrations presented include the mapped background PM<sub>10</sub> concentration of 17.6 µg/m<sup>3</sup>.

ID	Location	Baseline	Baseline + Development	Development Impact (% of AQO)	Significance
1	1 Cattlegate Cottages	17.8	17.8	0.010%	Negligible
2	Colesdale Farm	17.9	17.9	0.020%	Negligible
3	Wells Farm	18.1	18.1	0.038%	Negligible
4	Tennis Courts	18.1	18.1	0.037%	Negligible
5	11 Colesdale	17.9	17.9	0.030%	Negligible
6	34 Northaw Road East	17.9	17.9	0.027%	Negligible
7	M. Thurlow and Co, Station Road	18.2	18.2	0.053%	Negligible
8	10 Plough Hill	18.0	18.0	0.0075%	Negligible

Figure 5.5: Predicted Annual Mean PM<sub>10</sub> Concentrations (µg/m<sup>3</sup>)

<sup>11</sup> D. Laxen and B Marner (2003) Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites.

5.15 Predicted annual mean PM<sub>10</sub> concentrations are below the AQO of 40 µg/m<sup>3</sup>, both with and without the proposed development. The development impacts are 'imperceptible' (<1% of the AQO) and therefore of negligible significance at all locations.

5.16 The number of exceedences of the short-term (24-hour) PM<sub>10</sub> objective of 50 µg/m<sup>3</sup> (A) has been calculated from the annual mean following the approach set out by DEFRA in LAQM.TG(09):

$$A = -18.5 + 0.00145 \times \text{annual mean}^3 + (206/\text{annual mean}).$$

5.17 Based on the above approach, the maximum predicted number of exceedences is between 1 and 2 for the baseline scenario, with no change in the number of days exceeding the objective as a result of traffic associated with the proposed development. The objective for this pollutant permits up to 35 days per annum and therefore an exceedence of this objective is highly unlikely. The effect of the proposed development on the maximum number of exceedences of the 24-hour mean PM<sub>10</sub> objective is therefore negligible.

5.18 Predicted annual mean PM<sub>2.5</sub> concentrations at the selected receptor locations are presented in Figure 5.6. The concentrations presented include the mapped background PM<sub>2.5</sub> concentration of 11.9 µg/m<sup>3</sup>.

ID	Location	Baseline	Baseline + Development	Development Impact (% of AQO)	Significance
1	1 Cattlegate Cottages	12.0	12.0	0.0080%	Negligible
2	Colesdale Farm	12.1	12.1	0.020%	Negligible
3	Wells Farm	12.2	12.2	0.036%	Negligible
4	Tennis Courts	12.2	12.2	0.036%	Negligible
5	11 Colesdale	12.1	12.1	0.028%	Negligible
6	34 Northaw Road East	12.1	12.1	0.028%	Negligible
7	M. Thurlow and Co, Station Road	12.3	12.3	0.052%	Negligible
8	10 Plough Hill	12.1	12.1	0.0080%	Negligible

Figure 5.6: Predicted Annual Mean PM<sub>2.5</sub> Concentrations (µg/m<sup>3</sup>)

5.19 Predicted annual mean PM<sub>10</sub> concentrations are below the EU limit value of 25 µg/m<sup>3</sup>, both with and without the proposed development. The development impact is 'imperceptible' (<1% of the EU Limit value) at all receptor locations, therefore the significance of the impact is considered to be negligible.

## 6 Mitigation

### Construction Phase

6.1 It is recommended that the following 'best practice' measures be implemented, as appropriate during the construction phase:

- ensure effective site planning locating layout machinery and dust causing activities away from sensitive receptors;
- erect solid screens or barriers around the site boundary;
- vehicles carrying loose aggregate and workings should be sheeted at all times;
- all vehicles should switch off engines when not in use i.e. no idling vehicles should occur at the site;
- no site runoff of water or mud should be allowed;
- stockpiles should be kept for the shortest time possible and if necessary, the use of sprinklers and hoses for dampening of exposed soil and materials should be employed;





- observation of wind speed and direction prior to conducting dust-generating activities to determine the potential for dust nuisance to occur, avoiding potentially dust-generating activities during periods when wind direction may carry dust into sensitive areas and avoiding dust-generating operations during periods of high or gusty winds;
  - stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of prevailing wind directions and seasonal variations in the prevailing wind;
  - completed earthworks should be covered or vegetated as soon as is practicable;
  - regular inspection of local highways and site boundaries to check for dust deposits and, if necessary removal and cleaning of any deposits;
  - visual inspection of site perimeter to check for dust deposition (evident as soiling and marking) on vegetation, cars and other objects and taking remedial measures if necessary;
  - minimise surface areas of stockpiles (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up;
  - ensure concrete batcher, where used, has a permit to operate and is operated in accordance with Process Guidance Note 3/1 (04);
  - use of dust-suppressed tools for all operations;
  - ensuring that all construction plant and equipment is maintained in good working order; and
  - no unauthorised burning of any material anywhere on site.
- 6.2 Construction vehicles should be kept clean and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.
- 6.3 It is recommended that liaison with the Local Authority be maintained throughout the construction process, and any incidents which lead to excessive elevation of dust deposition and/or PM<sub>10</sub> concentrations at neighbouring sensitive receptors are reported to the Environmental Health Department. If complaints are received from local residents, these will be documented in a diary or log held on site by the Site Manager. A nominated member of the construction team (e.g. Site Manager) will also act as a point of contact for residents who may be concerned about elevated deposition of dust.
- 6.4 Through good site practice and the implementation of suitable mitigation measures as detailed above, the impact of dust and PM<sub>10</sub> releases off-site are considered to be negligible.

#### *Operational Phase*

- 6.5 The significance of the predicted impacts due to traffic associated with the development are negligible, therefore no specific mitigation measures are required.

## **7 Conclusions**

#### *Construction Phase*

- 7.1 An air quality impact assessment has been carried out to assess both construction and operational effects of the proposed development.
- 7.2 An assessment of the potential effects during the construction phase has been carried out. This has shown that during this phase of the proposed development releases of dust and PM<sub>10</sub> are likely to occur during site activities. Through good site practice and the implementation of suitable mitigation measures, the impact of dust and PM<sub>10</sub> releases will be substantially reduced and the significance of the resultant effects is considered to be negligible.

- 7.3 Dispersion modelling has been carried out to assess the impact of vehicular emissions from operational traffic associated with the proposed development. The predicted concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at all of the identified receptors are well within the relevant air quality standards with the proposed development in place. It can also be concluded that the NO<sub>2</sub> concentrations at the land with the proposed change of use to playing fields will be well below relevant air quality objectives. The significance of the predicted development impact is considered to be negligible.
- 7.4 A summary of the air quality residual effects for the proposed development are presented in Figure 7.1.

Potential Effect	Nature of Effect (Permanent or Temporary)	Significance	Mitigation / Enhancement Measures	Residual Effects
Dust generated during demolition/ construction phases	Temporary	Moderate Adverse	Best practice mitigation measures	Negligible
Emissions from construction traffic	Temporary	Negligible	None	None
Emissions from development traffic	Permanent	Negligible	None	None

**Figure 7.1:** Summary of Air Quality Impacts and Residual Effects

## 8 Limitations

- 8.1 The benefits of this report are provided solely to Lands Improvement Holdings Ltd. The conclusions and recommendations contained herein are limited to those given the general availability of background information and the planned usage of the site. Brookbanks Consulting Ltd do not confer any third party rights for the information contained in the report.
- 8.2 Third party information has been used in the preparation of this report, which Brookbanks Consulting Ltd, by necessity assume is correct at the time of writing.



Appendix

## Appendix A – Air Quality Terminology

Magnitude of Change	Annual Mean
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective (AQO)	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
Exceedence	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
LAQM	Local Air Quality Management.
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO <sub>2</sub>	Nitrogen dioxide.
NO <sub>x</sub>	Nitrogen oxides.
O <sub>3</sub>	Ozone.
Percentile	The percentage of results below a given value.
PM <sub>10</sub>	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
ppb (parts per billion)	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppb means that for every billion (10 <sup>9</sup> ) units of air, there is one unit of pollutant present.
ppm (parts per million)	The concentration of a pollutant in the air in terms of volume ratio. A concentration of 1 ppm means that for every billion (10 <sup>6</sup> ) units of air, there is one unit of pollutant present.
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
µg/m <sup>3</sup> (micrograms per cubic metre)	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m <sup>3</sup> means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
UKAS	United Kingdom Accreditation Service.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy', and has replaced it on recent European legislation.
USA	Updating and Screening Assessment.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.



## Appendix B – Air Quality Standards and Objectives

Pollutant	Standard ( $\mu\text{g}/\text{m}^3$ )	Averaging Period	No. of Permitted Exceedences per Annum
NO <sub>2</sub>	40 (c)	Annual	n/a
	200 (c)	1-Hour	18 (a)
PM <sub>10</sub>	40 (c)	Annual	n/a
	50 (c)	24-Hour	35 (b)
PM <sub>2.5</sub>	25 (d)		
(a) Equivalent to the 99.8 <sup>th</sup> percentile of 1-hour means (b) Equivalent to the 90.4 <sup>th</sup> percentile of 24-hour means (c) UK Air Quality Objective (d) EU Limit Value			



## Appendix C – Dispersion Model Input Parameters

Road Link	Baseline		Baseline and Development		Average Speed (kph) (a)
	AADT	HGV (%)	AADT	HGV (%)	
Northaw Road West	5,812	3.4	6,011	3.3	50
Cattlegate Road	11,729	3.5	11,976	3.4	50
Northaw Road East (Cattlegate Road to Site Access)	13,462	3.3	13,908	3.2	50
Site Access	0	0	1,033	0.0	20
Northaw Road East (Access to Station Road)	13,462	3.3	14,049	3.2	30
Station Road	12,943	3.3	13,483	3.2	20
Plough Hill	7,355	3.1	7,402	3.1	20
(a) Low traffic speeds have been assumed for all road links to enable a conservative assessment of impacts in the absence of local monitoring data for model verification.					



## Appendix D – Copy of Correspondence from Environment Agency

creating a better place



Matt Smith  
Marrons  
Meridian South  
Meridian Business Park  
Leicester  
LE19 1WY

Our ref: NE/2014/119730/02-L01

Date: 25 April 2014

Dear Matt

**Land at Northaw Road, Cuffley.**

**Proposal for 120 new homes on land at Northaw Road, Cuffley.**

Thank you for your letter, and I apologise for the delay in responding. We have considered your points and agree that that looking at the plan you have submitted our distances were on the conservative side as we only had the red line boundaries to go on.

In clarifying our position I wish to highlight that the issue of odour is not one which would cause us to object at the planning stage. It is however something that you should be aware of. Experience has shown that even with the best intentions there is a residual risk that these facilities can cause malodors which have the potential to reduce the quality of life for residents.

Should you have any queries please do not hesitate to contact me,

Yours sincerely

**Mr Kai Mitchell**  
**Sustainable Places Planning Advisor**

Direct dial 01707 632388  
Direct e-mail [SPHatfield@environment-agency.gov.uk](mailto:SPHatfield@environment-agency.gov.uk)

Environment Agency  
Apollo Court, 2 Bishops Sq Business park, Hatfield, Herts, AL10 9EX.



03/05/2015

## Sarah Dealtry

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**From:** SPHatfield <SPHatfield@environment-agency.gov.uk>  
**Sent:** 29 October 2014 09:12  
**To:** Richard Moorcroft  
**Subject:** RE: 10316 EA response for Land At Northaw Road, Cuffley.

Richard

Apologies for the delay I'm afraid I was out of the office yesterday – yes its true we wouldn't object on Odour as it's not our remit – the LPA can request assessments at the planning stage but we would only regulate the source of the odour through a permitted site (which can be notoriously difficult). We would not object to new developments which occur in close proximity, but we would flag up where we believe there is going to be potential future problems.

We would be happy to review your FRA, we have a set time for FRAs which is four hours plus 2 hours of Project management – you are only charged for time taken, so in reality it will be less than this but this allows us to be able to have a bit of capacity should there be any follow up concerns. I'm happy to put a quote together for you . Are you the applicant? We set the agreement up direct with them (but are happy to have all correspondence go through yourselves). If you could provide me with a name and billing address I can put the quote together for you.

If you have any queries please feel free to contact me.

Regards

**Kai Mitchell**  
**Planning Advisor**

Sustainable Places | Environment Agency - Hertfordshire and North London  
Apollo Court, 2 Bishops Square Business Park, St Albans Road West, Hatfield, Herts, AL10 9EX  
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**From:** Richard Moorcroft [mailto:Richard.Moorcroft@brookbanks.com]  
**Sent:** 27 October 2014 16:20  
**To:** SPHatfield  
**Cc:** Aisha Allie  
**Subject:** RE: 10316 EA response for Land At Northaw Road, Cuffley.

Hi Kai,

Many thanks for your response and I appreciate your points. However, I attach correspondence between yourself and Marrons dated 25<sup>th</sup> April 2014. This states that the issue of odour is not one which would cause you to object at planning stage, I assume that this is still the case? Apologies for chasing on this, although I am trying to make sure we have a clear picture of any issues and the attached seems to contradict the recent response we have received.

Finally, in addition to the drainage strategy we would be keen to submit our FRA for you to review, could we look to set up an agreement?



Best regards

**Richard Moorcroft** BEng (Hons) CEng MICE MCIOHT  
Principal Consultant

## Brookbanks

Brookbanks Consulting Ltd  
6150 Knights Court  
Solihull Parkway  
Birmingham Business Park  
Birmingham  
B37 7WY

Office: 0121 329 4330  
Direct: 0121 329 4344  
Web: [www.brookbanks.com](http://www.brookbanks.com)



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**From:** SPHatfield [<mailto:SPHatfield@environment-agency.gov.uk>]  
**Sent:** 27 October 2014 15:23  
**To:** Richard Moorcroft  
**Subject:** RE: EA response for Land At Northaw Road, Cuffley.

Richard

Thank you for your email – you are correct it is the same letter I previously sent – all our preapps now only have the one version. I don't feel the need to amend the wording to specifically say we will not object to odour as it would not be in our remit to do so in the first place. Although, as the body responsible for having to deal with the odour complaints from any future potential residents we obviously would prefer that this site was not used for housing. Similar housing within this range of open composting windrows have shown that regardless of the best intentions of the site operator there will be complaints depending on the weather and wind direction.

I'm also afraid that I can't comment on the flood risk and drainage information that you sent over – to be able to look at the figures would involve me having to get one of our flood risk team to comment (as I'm not an expert!) and I can't do this outside of a formal charging agreement. All I would say that as long as your proposals are in line with our guidance (and they appear to be – greenfield rates and SuDS) then I can't see why we would have any concerns.

Sorry to have not been of more help. If you wish I can set up a charging agreement for us to review the Qbar figures, however I would advise that if you wanted to do this it would be better to submit us an actual FRA for the site so we can give a more accurate response.

Regards

**Kai Mitchell**  
**Planning Advisor**

Sustainable Places | Environment Agency - Hertfordshire and North London  
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**From:** Richard Moorcroft [<mailto:Richard.Moorcroft@brookbanks.com>]

**Sent:** 27 October 2014 11:04

**To:** SPHatfield

**Cc:** Aisha Allie

**Subject:** RE: EA response for Land At Northaw Road, Cuffley.

Hi Kai,

Thank you for providing us with your preliminary advice on this scheme, I note this is very similar to the advice provided to Marrons dated 25<sup>th</sup> February 2014. We appreciate that for further pre application advice there is a charge, but we would be grateful for your specific comments on the following matters which are hopefully straightforward:

**Flood Risk and Drainage**

We are promoting a sustainable drainage strategy using a multi-tiered SUDs system, comprising: porous paving, swales and attenuation ponds. These systems will restrict the final surface water discharge to the greenfield  $Q_{BAR}$  rates with an outfall into an existing ordinary water course. Note, the connection from the southern basin to the watercourse runs through land which is under the land owners control and the red line boundary is being updated to include this route. Please see attached for the drainage strategy plan on which we would be grateful for your comments plus any other recommendations.

Thames Water has confirmed that the proposed foul sewers from the development can be connected to an existing foul sewer which runs through the site itself.

**Air Quality**

As indicated in your earlier response to Marrons dated 25<sup>th</sup> April 2014, we note that you stated that the issue of odour (in relation to the proposed Anaerobic Digestion and Compost Facilities) is not one which would cause you to object at planning stage. We would be very grateful if you could confirm that this is indeed the case.

Many thanks

**Richard Moorcroft** BEng (Hons) CEng MKE MCIHT  
Principal Consultant

## Brookbanks

Brookbanks Consulting Ltd  
6150 Knights Court  
Solihull Parkway  
Birmingham Business Park  
Birmingham  
B37 7WY

Office: 0121 329 4330  
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Web: [www.brookbanks.com](http://www.brookbanks.com)



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**From:** SPHatfield [<mailto:SPHatfield@environment-agency.gov.uk>]  
**Sent:** 23 October 2014 14:59  
**To:** Aisha Allie  
**Subject:** EA response for Land At Northaw Road, Cuffley.

Aisha

Please find our response enclosed. If you have any queries please feel free to contact me.

Regards

**Kai Mitchell**  
**Planning Advisor**

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