Report

16 April 2014

TEMPLE

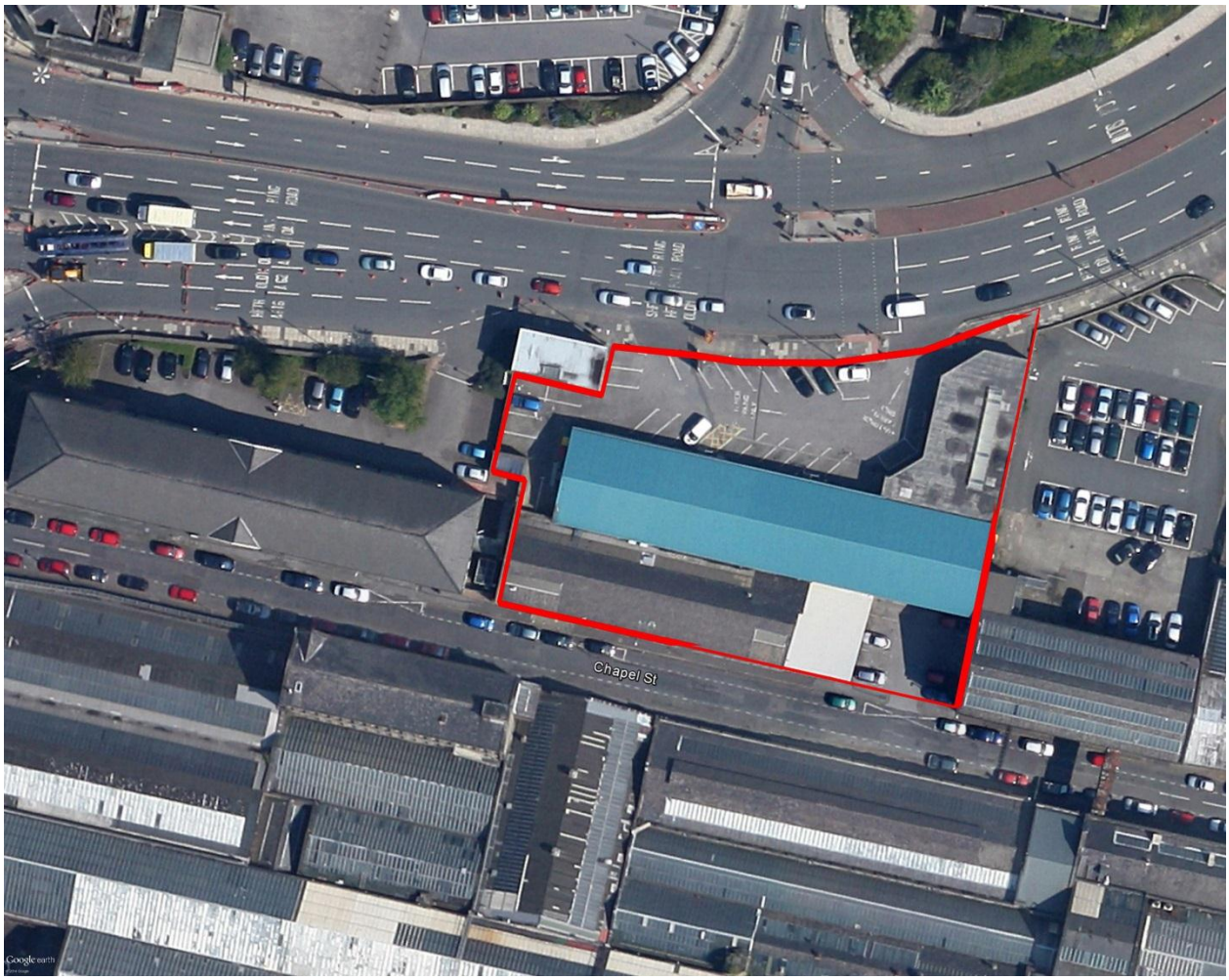
LEADERS IN ENVIRONMENT, PLANNING & SUSTAINABILITY.

Report for – Jaguar Estates / Wortley Developments Joint Venture

T2416 – Proposed Development near Queensgate ring-road, Huddersfield

Air Quality Assessment

Status: Final



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Appendices

1.0 Introduction

Jaguar Estates and Wortley Developments JV are in the process of applying for planning permission to develop a mixed-use commercial and student residence scheme at Queensgate. The site is located along the southern section of the major ring-road located in the centre of Huddersfield.

The proposed development will provide 60 student residence units over four floors with commercial units on the ground floor. The location of the development is shown in **Appendix 1.**

Jaguar Estates / Wortley Developments JV commissioned Temple Group Limited (Temple) to provide an air quality assessment and mitigation report to satisfy Kirklees Council that the future residents of the development will not be exposed to pollutant concentrations that exceed national air quality objective levels.

2.0 Relevant legislation and policy

2.1 Air Quality Strategy

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) [1] sets the framework for government policy on air quality in the UK. The AQS sets out air quality standards and objectives to be achieved and introduces a policy framework for tackling fine particles. In setting air quality objectives, due account was taken of health and socio-economic cost-benefit factors, together with consideration of the practicalities of achieving such targets. Air quality objective levels are set out in legislation in the Air Quality (England) Regulations 2000[2], as amended[3].

Although achievement of air quality objectives is not a statutory requirement, they reflect statutory limits outlined in The Air Quality Standards Regulations 2010[4], which require the Secretary of State to achieve EU limit values set out in EU Ambient Air Quality Directives[5] [6].

The air quality objectives outlined in the AQS relevant to this assessment have been provided below in **Table 2.1**.

Table 2.1 – Relevant UK air quality objectives for the purpose of the assessment

Pollutant	Air Quality Objective Levels	Measured as	Dates to be achieved and maintained thereafter
Nitrogen dioxide	200 µg/m^3, not to be exceeded more than 18 times per year	1-hour mean	31 December 2005
	40 µg/m^3	Annual mean	31 December 2005
Particles (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times per year	24hour mean	31 December 2004
	40 µg/m^3	Annual mean	31 December 2004

[1] Department of the Environment, Food and Rural Affairs, et al, 2007, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 1 s.l, s.n.

2 The Air Quality (England) Regulations 2000 (2000 No. 928)

3 The Air Quality (England) (Amendment) Regulations 2002 (2002 No. 3043)

4 The Air Quality Standards Regulations 2010, (2010 No. 1001). London:HMSO.

5 The European Parliament and the Council of the European Union, 2008, Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air and cleaner air for Europe. Official Journal of the European Union L152/2 11.6.2008.

6 The European Parliament and the Council of the European Union , 2004, Directive 2004/107/EC of the European Parliament and of the Council of 15 May 2005 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. (Fourth Daughter Directive). Official Journal of the European Union L23/3 26.1.2005.

2.2 The Environment Act 1995

The Environment Act 1995[7], specifically sections 82-84, requires all local authorities to carry out periodic reviews of air quality within their administrative areas. This review and assessment process now follows a phased approach, whereby local authorities only undertake a level of assessment that is commensurate with the risk of an air quality objective being exceeded. The aim of this review process is to assess whether the AQS objectives are likely to be achieved. Areas where objectives are likely to be exceeded are to be declared air quality management areas (AQMAs) by the local authorities.

The first step of the review and assessment process is an Updating and Screening Assessment, which is to be undertaken by all authorities. This assessment should cover new monitoring data; new objectives; new sources or significant changes to existing sources; either locally or in neighbouring authorities and other changes that might affect air quality within its jurisdiction.

Where the Updating and Screening Assessment has identified a risk that an air quality objective will be exceeded at a location with relevant public exposure, the authority will be required to undertake a Detailed Assessment following the guidance set out in Part IV of the Environment Act 1995 Local Air Quality Management Technical Guidance (LAQM.TG (09)). The aim of the detailed assessment should be to identify with reasonable certainty whether or not a likely exceedence will occur. Where a likely exceedence is identified, then the assessment should be sufficiently detailed to determine both its magnitude and geographical extent. Local authorities should not declare an AQMA unless a Detailed Assessment has been completed.

2.3 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[8] was published on the 27th March 2012 and has replaced all Planning Policy Guidance and Planning Policy Statements, including PPS23: Planning and Pollution Control.

It sets out the government's planning policies for England and how these are expected to be applied. It seeks to positively improve the quality of the built, natural and historic environment, as well as in people's quality of life, including improving the conditions in which people live, work, travel and take leisure. One of the core principles of the document is to contribute to conserving and enhancing the natural environment and reducing pollution.

The NPPF 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 AQMAs and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in AQMAs is consistent with the local air quality action plan.

[7] The Environment Act. 1995. Sections 82-84.

[8] Department of Communities and Local Government. 2012. National Planning Policy Framework (NPPF).

3.0 Local policy

3.1 Kirklees Local Development Framework

Kirklees Metropolitan Council is in the process of phasing in a Local Development Framework (LDF), which replaces the Unitary Development Plan (UDP)[9] that was adopted in 1999. LDF polices regarding air quality have not been saved from the UDP.

3.2 Kirklees Air Quality Action Plan

Prior to the designation of two air quality management areas (AQMAs) in Kirklees, the Council published an air quality action plan (AQAP)[10] in 2007 to promote better air quality conditions within the district. The AQAP states that the Council will impose the following measures to improve air quality:

- regular monitoring and assessment of air quality across Kirklees;
- the examination of all planning applications see whether air quality is a material consideration in that application;
- the development of robust advice to be given to developers and planners in relation to air quality and which can be applied in the planning decision making process;
- annual reports to be made of the pollution levels of NO_2 and PM_{10} across Kirklees; and
- pollution control and industrial regulation.

[9] Kirklees Council. 1999. Unitary Development Plan (UDP).

[10] Kirklees Council. 2007. Air Quality Action Plan. https://www.kirklees.gov.uk/community/environment/pollution/pdf/airqualaction.pdf

4.0 Baseline conditions

4.1 Kirklees Borough review and assessment process

In 2011 Kirklees Council published an air quality progress report which evaluated the air quality across the borough and highlighted a number of locations that were found to exceed the UK air quality objectives[11].

The Huddersfield ring road was found to be a pollution hotspot for NO_2 with annual mean concentrations above the 40µg/m^3 objective. The need for a detailed assessment at this location has been identified by Kirklees Council; however this has not yet been undertaken. This busy ring road is located adjacent to the proposed development site.

Trends in NO_2 levels in recent years have not followed expected trends and have remained at similar or slightly increased levels in many locations. Changes in vehicle technology and the increasing dieselisation of the UK car fleet have meant that NO_2 concentrations have remained stubbornly high. However, the progress report notes that Euro 6/VI emissions standards will further reduce pollutant emissions from road vehicles and NO_2 concentrations at roadside locations are likely to reduce in future years.

Kirklees Council has designated two AQMAs. One was declared in 2008 around the Leeds Road / Bradley Road junction due to exceedences of NO_2 annual mean objective. The second AQMA was declared in 2009 in the Scout Hill area of the A644 Huddersfield Road due to exceedences of 24 hour mean PM_{10} objective. The proposed development is not located within either of these AQMAs.

4.2 Monitoring data

Kirklees Council undertakes monitoring at a number of locations within the district using continuous monitors and diffusion tubes. The nearest continuous monitors to the site are described below:

- A continuous monitor at the junction of Old Fieldhouse Lane and Leeds Road, approximately 2.7km north east of the proposed site. This monitors NO_2, PM_{10}, SO_2, O_3 and CO and is a roadside site.

- A continuous monitor at the junction of Queens Street and Huddersfield Road, in Dewsbury approximately 8.9km north east of the proposed site. This monitors NO_2 and PM_{10} and is a roadside site.

Table 4.1 and **Table 4.2** present recent NO2 and PM10 data for the nearest continuous monitoring sites. The locations of the air quality monitoring sites are show in **Appendix 1**.

Table 4.1 shows monitoring results from the junction of Old Fieldhouse Lane and Leeds Road roadside monitoring site, located on a main road with an AQMA.

The PM_{10} and NO_2 annual mean objectives have been met at this monitoring location in recent years. In addition the 24-hour mean objective for PM_{10} and the hourly mean objective for NO_2 have also been met at this location in recent years.

[11] https://www.kirklees.gov.uk/community/environment/pollution/pdf/2010-11airqualityprogress.pdf

Table 4.1 - Annual mean concentrations at the junction of Old Fieldhouse Lane and Leeds Road monitoring location (µg/m^3)

Year	Concentration PM_{10}	PM_{10} Objective	Concentration NO_2	NO_2 Objective
2007	27	40	28	40
2008	26	40	29	40
2009	23	40	32	40
2010	22	40	33	40

Note: Monitoring data for 2011, 2012 and 2013 were not available at the time of writing this report.

Table 4.2 shows monitoring results from the junction of Queens Street and Huddersfield Road roadside monitoring site, located on a main road near an AQMA.

The PM_{10} and NO_2 annual mean objectives have been met at this monitoring location in recent years. The hourly mean objective for NO_2 has also been met at this location in recent years. The 24-hour mean objective was exceeded for PM_{10} in 2008 and 2009 at this site; in 2010 this met the AQS objectives.

Table 4.2 – annual mean concentrations at the junction of Queens Street and Huddersfield Road monitoring location (µg/m^3)

Year	Concentration PM_{10}	PM_{10} objective	Concentration NO_2	NO_2 objective
2007	25	40	33	40
2008	35	40	36	40
2009	35	40	35	40
2010	27	40	37	40

Note: Monitoring data for 2011, 2012 and 2013 were not available at the time of writing this report.

The results of NO_2 diffusion tube monitoring locations in the vicinity of the site are shown in **Table 4.3**. The locations of these the air quality monitoring sites are shown in **Appendix I.**

The bias-adjusted monitoring results indicate that the annual mean objective (40µg/m^3) for NO_2 has been exceeded at all roadside monitoring locations at the ring road.

Table 4.3– annual mean NO2 concentrations at diffusion tube sites (µg/m^3)

Location	Distance from site	Classification	2007	2008	2009	2010	NO_2 objective
Chapel Hill	80m W	Roadside	72	53	51	67	40
Huddersfield Bus Station	390m NW	Roadside	41	48	39.9	49	40
Westgate	550m NW	Roadside	55	59	47	63	40
Castlegate	650m NW	Roadside	40	43	34	45	40
Apartments – Bus Station	580m NW	Roadside	53	57	47	54	40
Oldgate Apartments – Ring road	560m NE	Roadside	61	58	58	69	40

Note: Monitoring data for 2011, 2012 and 2013 were not available at the time of writing this report.

4.3 Air quality at the development site

The monitoring results in **Table 4.3** show that the NO_2 concentrations at Chapel Street have been well above the NO_2 annual mean objective between 2007 and 2010. Chapel Street borders the rear of the proposed development and one would expect the pollutant concentrations to be similar here.

The building has been designed so that residential units are positioned above the ground floor. Although pollution levels will be lower with distance above ground, based on the building's location, pollution concentrations are likely to still be high at the front facade on all floors. It is therefore likely that NO_2 levels at the front facade locations (above ground floor) will not be in compliance with the 40µg/m^3 objective when the development is completed.

5.0 Air quality assessment

5.1 Road traffic assessment

The Design Manual for Roads and Bridges (DMRB)[12] assessment has been scoped out due to the transport statement commissioned by the client showing a net reduction in AADT (Annual Average Daily Traffic), therefore there is unlikely to be any negative impact on air quality from the traffic associated with the proposed development.

Instead a baseline assessment of air quality has been undertaken in **Section 4** to determine the potential air quality effects on the occupants of the proposed development, as a result of the proximity to the Queensgate ring-road.

5.2 Construction dust assessment

The potential for construction and demolition activities to create pollution is dependent on a range of factors that are often specific to each site. Due to the variable nature of construction techniques and activities it is difficult accurately to assess potential impacts, especially when they have not been identified.

Given the variability of construction sites and the range of activities undertaken, making an accurate assessment of the dust and air pollutants generated is not always feasible or practicable. Instead, a more qualitative assessment has been undertaken to examine potential areas of concern and identify the best practicable means (BPM) for mitigating potential emissions.

The Institute of Air Quality Management (IAQM) guidance document[13] for assessing the risk of dust and emissions from construction and demolition sites provides useful information on managing and mitigating construction dust emissions. This document has been used as a basis for assessing potential impacts from the proposed development.

This assessment identifies potential works that may generate dust and incorporates a list of appropriate mitigation measures to control them.

5.2.1 Screening

An assessment of construction dust effects is normally required if there are:

- human receptors within 350m of the site boundary; or within 50m of the route used by construction vehicles on a public highway, up to 500m from the site entrance; or
- ecological receptors within 50m of the site boundary; or within 50m of the route used by construction vehicles on a public highway, up to 500m from the site entrance.

[12] Department of Transport, 2007. *Design Manual for Roads and Bridges* (DMRB), Volume 11 Environmental Assessment, Section 3, Part 1, HA 208/07 'Air Quality'.

[13] Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction.

If these criteria are not met, it can be assumed that the level of risk from dust nuisance will be negligible and any effects will not be significant.

As human receptors are within 180m of the site boundary of the proposed development and the construction vehicle route exits directly onto the A62 Queensgate, a dust risk assessment has been undertaken. Ecological receptors are not present within 50m of the site boundary and therefore have been screened out of this assessment.

5.3 Demolition

The construction of the proposed development in Huddersfield will include the demolition of several retail units currently located on the site.

The dust emission class for demolition has been determined through taking into account the total building volume and type of building material to be demolished, as well as the presence of demolition activities such as on site crushing of building material.

The volume of the building to be demolished has been estimated to be less than 5,000m^3; this, combined with the potentially dusty nature of the material comprising the buildings to be demolished, indicates that the dust emissions class is likely to be medium.

5.4 Earthworks

There will not be any significant earthworks undertaken during the development of the site. Therefore this activity has not been assessed.

5.5 Construction

The structures on the site will cover just over half of the site and will comprise four storeys. The total building volume has therefore been estimated to be less than 10,000m^3, this combined with the use and production of concrete on site justifies a likely emissions class of medium for construction activities.

5.6 Track-out

The site access and egress will be to the north of the site onto the Queensgate ring road and therefore any construction vehicles will exit directly onto the main road. There will be fewer than 10 heavy-duty vehicle (HDV) movements from the site per day and the unpaved road length is less than 50m, so the likely dust emissions class for this activity is small.

5.7 Significance of dust effects

The surrounding area has a low density of residential properties, with nearby properties comprising primarily office buildings and industrial units. Residential properties which have a high sensitivity to dust soiling effects have been identified 180m to the south west of the site. Medium-sensitivity receptors have been identified less than 20m west of the site boundary at Huddersfield County Court offices. No schools or hospitals have been identified within 350m of the site boundary.

Using the IAQM guidance, the sensitivity of the surrounding area has been determined for dust soiling effects and health effects. This is shown in **Table 5.1**. The dust soiling effects sensitivity has been found to be medium due to the close proximity of the office building (a medium sensitivity receptor[14]) to the site. The health effects sensitivity has also been determined to be medium, as

[14] As per the IAQM guidance, the highest level of sensitivity has been considered in this assessment. Although high-sensitivity receptors (residential properties) are located within 200m of the site, the medium=sensitivity receptors within 20m of the site are more sensitive to the activities on site due to their proximity.

there are 1 to 10 medium sensitivity receptors located within 20m of the site boundary at the County Court.

Table 5.1 – Sensitivity of the surrounding area

Potential impact	Sensitivity of the surrounding area			
	Demolition	**Earthworks**	**Construction**	**Track-out**
Dust soiling	Medium	N/A	Medium	Medium
Health effects	Medium	N/A	Medium	Medium

In order to determine the dust soiling and health effects from track-out, 500m of the length of the site exit route along the public highway is assessed. The number of medium-sensitivity receptors within 50m of the route is predicted to be more than 10; therefore the dust soiling and health effects of track-out are likely to be medium. There are no high-sensitivity receptors within 50m of the track-out route. The sensitivity of the area to dust soiling and health effects from the on-site activities is shown in **Table 5.2**.

Table 5.2 – Summary – dust risk of site activities

Potential impact	Sensitivity of the surrounding area			
	Demolition	**Earthworks**	**Construction**	**Track-out**
Dust soiling	Medium	N/A	Medium	Negligible
Health effects	Medium	N/A	Medium	Negligible

Overall the dust risk from site activities is medium, due to the low magnitude of the construction activities and low density of sensitive receptors in the surrounding area. Mitigation measures will help to negate some of the potential negative air quality impacts resulting from the construction of the proposed development.

6.0 Mitigation

6.1 Mitigation of high NO_2 pollutant concentrations

It is considered that some form of mitigation will be required in order to reduce NO_2 pollutant levels within the proposed development. We have subsequently worked with the developer's professional team to develop a strategy for pollution mitigation to the dwellings in the development. These residential units will be mechanically ventilated with heat recovery systems.

6.1.1 Ventilation system inlet and exhaust points

The inlet and exhaust points of the centralised ventilation system will be positioned on the rooftop to the rear of the building. There are no residential properties in the vicinity of the development that would be affected by noise nuisance from the ventilation system; however, consideration will be given to any future development in the area when positioning the inlet and exhaust points.

6.1.2 NO_2 filtration system

Annual average NO_2 concentrations approaching 70µg/m^3 have been monitored in the vicinity of the proposed development. Therefore the filter media in the ventilation system must be capable of reducing the NO_2 concentrations in the dwellings to less than 40µg/m^3, to ensure that the occupants are not exposed to NO_2 concentrations in excess of the national air quality objectives.

6.1.3 Air change to dwellings

Each dwelling must be provided with a suitable air change rate by the air purification system to ensure that comfort levels are sufficient and that the occupants do not need to open the windows for additional ventilation during periods of high outdoor pollutant concentrations.

Each dwelling will have a floor space of 30.5m^2 and, assuming a ceiling height of 2.5m, each dwelling will need 85 litres of purified air every second to ensure adequate ventilation for the occupant.

6.1.4 Purification system maintenance procedures

There are currently a number of NO_2 filter media options on the market and each filter system will have its own maintenance requirements.

The filter media used must be certified to strict manufacturing standards that are maintained and records must be retained concerning the manufacturing processes. The quality system must ensure repeatability in the air purification systems performance.

The filter media must be maintained and exchanged in line with the manufacturer's recommendations to ensure optimal NO_2 mitigation from the outdoor environment.

6.2 Mitigation of construction dust effects

Under best practice guidance, the proposed site in Huddersfield would constitute a medium-risk site and has potential for emissions and dust to have occasional and minor impacts on nearby receptors.

The primary impacts associated with this development are likely to be in the form of dust generated during demolition and construction.

Use of appropriate mitigation measures throughout the construction period will ensure that impacts to sensitive receptors are minimised or removed. The following best practice mitigation measures should be included in the construction method statement:

- no burning of any materials;
- provision of adequate water supply to the working areas;
- no dry sweeping of large areas will be carried out;
- un-surfaced haul routes and working areas will be regularly damped down in dry conditions;
- all vehicles carrying loose or potentially dusty material to or from the working areas will be fully sheeted;
- minimum drop heights will be used from conveyors, loading shovels and loading equipment; and
- suitable dust suppression techniques such as water sprays or local extraction will be used when cutting, grinding or sawing materials on site.

These mitigation measures are intended to be a summary of the key controls specific to this site in order to minimise potential emissions. Provided that these measures are used appropriately, no significant effects are expected to arise from the site during demolition and construction.

These measures are not intended to be a comprehensive list of all best practice guidance; for more complete mitigation measures and control, the IAQM guidance on the assessment of dust from demolition and construction[15] should be consulted.

[15] Institute of Air Quality Management (2014) Guidance on the assessment of dust from demolition and construction.

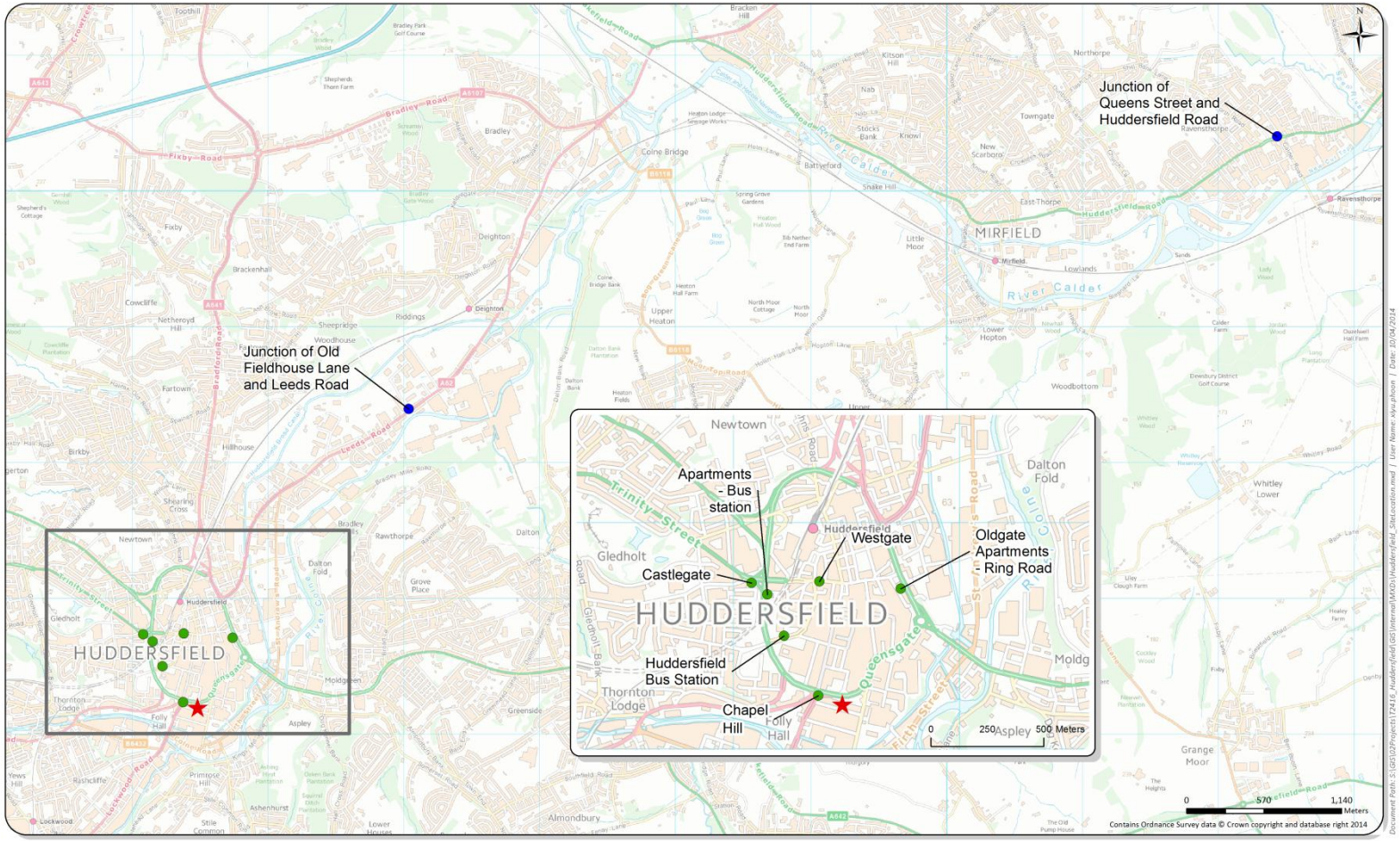
7.0 Conclusion

The air quality assessment has identified that the proposed development will not give rise to significant increases in air pollution. Without mitigation, NO_2 concentrations exceeding national air quality objective levels would be likely at the proposed development and construction effects could potentially cause occasional and minor impacts. Recommendations for mitigation have been made in respect of the ventilation system and NO_2 filtration system. No other mitigation is considered necessary to protect the future residents of the proposed development from high outdoor NO_2 concentrations.

Following the use of dust control mitigation measures during the construction of the development, any nuisance dust effects in the vicinity will be minimal.

The residual impacts of the development will be negligible.

Appendix I – site and monitoring locations



Project: **T2416 - Proposed Development near Queensgate ring-road, Huddersfield**
Client: **Jaguar Estates / Wortley Developments (Joint Venture)**

Site Location and Monitoring Locations

Legend
Site location
Monitor type
Continuous
Passive

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