AIR QUALITY ASSESSMENT

Market Street Huddersfield

Malik

Introduction

This air quality assessment to support a full planning application for a proposed student residential development at Kirklees House, Huddersfield. The site is located within Kirklees Council's Air Quality Management Area (AQMA) No. 9 covering Huddersfield Town Centre.

The development proposes a change of use to the existing building, converting the tower office accommodation into 107 studio apartments for students, with the ground floor and basement to be developed as a gym, food and drink unit, residence lounge, study area and entrance.

Scope of Assessment

In setting the scope of assessment, consideration has been made of the potential for effects to occur during both the construction and operation phases of the development. Evaluation of the proposals within the wider context of West Yorkshire Low Emissions Strategy (WYLES) Air Quality & Emissions Technical Planning Guidance indicated that the proposed development was classified as 'Minor'. This is because the C3 element of the proposals contains less than 50 residential units, therefore the development does not meet the threshold criteria for Transport Assessment. As such, the WYLES technical guidance document requires assessment of relevant exposure and implementation of practical mitigation measures supported by the National Planning Policy Framework (NPPF). These should include adoption of an agreed protocol to control emissions during the construction phase, suitable allocation of electric vehicle charging points (where appropriate) and general provision of wider mitigation measures (Appendix A).

Construction

The proposed development does not involve any significant demolition activities. It is anticipated that the construction stage will take up to twelve months, and this is assumed to include limited construction, earthworks and trackout activities. The potential for air quality effects during the construction phase has been assessed, and the extent of mitigation required for dust/ Particulate Matter (PM10) generated by construction activities has been considered.

Machinery used during construction can generate new sources of emissions, as well as traffic movements to/from the site and the works themselves. When assessing the effect of dust emissions generated during construction works, receptors include those nearest to the construction boundary of the site in each direction. These receptors have the potential to experience effects of greater magnitude due to emissions of dust generated by the works, when compared with more distant receptors.

Without appropriate mitigation controls in place, there is the potential for adverse effects to occur during to the construction of the proposed development. The implementation of best practice mitigation controls can ensure any potential adverse effects would be not significant.

Best practice mitigation controls have been identified in accordance with the IAQM guidance, Guidance on the Assessment of Dust from Demolition and construction v1.1 (2016).

Operation

During the development's operation, consideration has been made of the potential emissions from road traffic generation as any additional traffic increase on local roads has the potential to effect concentrations of NO2 and PM10.

The final development designs will include some combustion plant used for heating and supply of hot water. This will be provided by a natural gas fired modular boiler system. Emissions from the boiler plant may have the potential to affect air quality at existing residential properties as well as future occupants of the proposed development. However, as final details of the boiler system are yet to be confirmed, combustion plant emissions have been scoped out of the current assessment. However, potential impacts may need to be addressed during subsequent phases of the planning process once final details are confirmed.

Potential exposure of future occupants of the site and nearby residential receptors was also considered in accordance with the IAQM Planning Guidance. It has been assumed that the operation phase of the development will commence in 2020.

Existing Building

Kirklees House is an existing nine-story building comprising retail and office accommodation and is located within Huddersfield Town Centre adjacent to the Huddersfield Conservation Area. It is bounded by Market Street.

The site is accessed for vehicular traffic off the A62 Queensgate Ring Road via Market Stree.

Approach and Methodology

Existing Conditions

Existing sources of emissions within the study area have been defined using several approaches. Industrial and waste management sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register and the Environment Agency's Pollution Inventory Data. Local sources have also been reviewed through examination of the Council's Air Quality Review and Assessment reports.

Information on existing air quality has been obtained by collating the results of monitoring carried out by the local authority. This covers both the study area and nearby sites; the latter being used to provide context for the assessment. Background concentrations have been defined using the national pollution maps published by Defra. These cover the whole country on a 1x1 km grid. Comparison of the mapped background concentrations with those measured at background locations in Warwick indicate that the use of monitored data is generally more conservative.

Construction Phase

The impact of anticipated construction activities has been assessed in accordance with IAQM guidance. The construction phase assessment considers the anticipated physical activities occurring on-site that are likely to result in the generation of dust which gives rise to impacts on dust soiling and human-health, especially through the generation of PM10 and PM2.5.

The assessment involves the identification of whether each phase of on-site activity (demolition, earthworks, construction, and trackout) represents a low, medium, or high risk of causing a significant effect and then identifies suitable mitigation measures for the relevant level of risk assigned.

Operation Phase

Road Traffic Emissions

ComparisonAgainstIAQMCriteria

IAQM's guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' (updated in January 2017) was issued to ensure that air quality is adequately considered in the land-use planning and developmental control process.

The guidance includes a method for screening the requirement for an air quality assessment, the undertaking of an air quality assessment, the determination of the air quality impact associated with a development proposal and whether this impact is significant. Interpretation of this guidance was used to develop a methodology for the assessment of road impact emissions.

Assessment Methodology

The Transport Statement prepared in support of the planning application states that the application site is highly sustainable, being located within easy walking distance of the bus and train stations, and the facilities of the town centre. Unlike the occupiers of the existing office space, the student residents will have no need to own cars due to the proximity of the University campus. Hence the impact of the scheme will be positive, leading to a reduction in traffic congestion and associated pollution. Cycle parking will be provided, but car parking will not be required.

On this basis, it is assumed that there will be a net reduction in development trips, therefore the impact of traffic related emissions has been scoped out of the air quality assessment.

Human Exposure

A desktop air quality assessment of the impacts of the local area's emissions on the proposed development itself was undertaken to determine the exposure that occupants of Kirklees House might experience during the operation phase.

The current/baseline conditions were established qualitatively by reviewing air quality information relating to that is readily available from Kirklees Council, including Review and Assessment Reports, historic monitoring data and information generated for the Detailed Assessment contained within the latest revision of the AQAP. These data were used to understand current and future baseline pollutant concentrations at receptors within the study area, and the risk that any changes in air quality may cause exceedance of AQOs at these locations.

Where assumptions have been made, a realistic conservative approach has been adopted.

Site Description and Baseline Conditions

To assess the significance of any new development proposal (in terms of air quality), it is necessary to identify and understand the baseline air quality conditions in and around the study area. This provides a reference against which any potential changes in air quality can be assessed. Since air quality is predicted to change in the future (mainly because of changes to vehicle emissions), the baseline situation is extrapolated forward to the opening year. The future baseline scenario is the predicted baseline for the opening year.

To identify the existing air quality conditions, a review of publicly available information has been undertaken, including the latest local authority air quality reports, monitoring data, and background concentration maps. This section presents the results of the review.

Local Air Quality Management

The proposed development is located within Kirklees AQMA No. 9 covering Huddersfield Town Centre (declared for exceedances of the annual mean NO2 AQO).

The baseline assessment includes a brief review and summary of Kirklees Council's LAQM Annual Status Report (ASR). The 2018 ASR concluded that the main air quality issues within Kirklees are focused around the road network connecting the towns, and traffic which passes between the West Yorkshire conurbation along the M62 and Greater Manchester.

There are currently 9 AQMAs declared in the district, including the one for Huddersfield Town Centre which came into effect in November 2011.

Current 5-year trends for NO2 indicate that the levels fell significantly between 2012 & 2013 within the Kirklees District, but since that time concentrations have stagnated for 3 years around 45 to 40 $\mu g/m^3$, which indicates further work is required in addition to improvements in vehicle engine technology and fleet turnover in order to bring about compliance.

An updated draft AQAP, which encompasses all nine AQMAs, was updated in June 2019 and is currently under consultation.

There are currently no AQMAs declared for PM10 exceedances in Kirklees.

Local Sources of Pollution

A review of data held by the Environment Agency indicated that four industrial pollution sources are located within 0.5km of the proposed development site boundary. Relevant information is summarised in Table 4.

Emission of pollutants from these processes is regulated by the Environment Agency under the Environmental Permitting regime. Emissions to air are monitored and controlled in accordance with the respective permit requirements.

Site	Details	Type	Emissions	Distance
Syngenta	Plant health and biocides; producing plant health products/biocides	A1	Carbon Monoxide, Nitrogen Oxides (NO and NO2 as NO2), Particulate Matter, Sulphur Oxides (SO2 and SO3) as SO2, Carbon Dioxide, Non-methane volatile organic compounds, Hydrofluorocarbons, Chlorofluorocarbons, Hydrogen Cyanide,	450m NE

			chlorine compounds (as HCl)	
Lubrizol Ltd	Organic chemicals; oxygen containing compounds e.g. alcohols	A1	Carbon Monoxide, Nitrogen Oxides (NO and NO2 as NO2), Non-methane volatile organic compounds, Particulate Matter, Sulphur Oxides (SO2 and SO3) as SO2, Carbon Dioxide	450m NE
Arch Timber Protection Ltd	Inorganic chemicals; salts e.g. ammonium chloride and associated processe	A1	Ammonia, Non-Methane Volatile Hydrocarbons	450 NE
Engie FM Ltd	Combustion; any fuel =>50mw	A1	Carbon Monoxide, Nitrogen Oxides (NO and NO2 as NO2), Particulate Matter, Sulphur Oxides (SO2 and SO3) as SO2, Carbon Dioxide	450 NE

4.3 Local Air Quality Monitoring

Kirklees Council operates a network of automatic monitors and diffusion tube monitoring sites. The closest monitoring points are located within a 500m radius to the north and south of the site. These include three roadside diffusion tube sites, one urban centre site and one located at the bus station.

Summarises the NO2 concentrations recorded at the sites between 2013 and 2017.

All sites show a general downward trend in NO2 concentrations over this period, apart from site 52 on the Ring Road, where values have increased from 51.8 µg/m^3 to 55.9 µg/m^3 NO2 between 2013 and 2017.

Site 11 is the most representative of roadside conditions near to the site. Values reduced from 42.4 µg/m^3 to 36.5 µg/m^3 NO2 between 2015 and 2017.

There is one urban centre diffusion tube (No. 7) located 400m north of the proposed development; monitored NO2 concentrations reduced from 46.3 µg/m^3 to 35.4 µg/m^3 NO2 between 2013 and 2017.

Site ID	Address	Site Type	Distance from Site	Annual Mean Concentration* (µg/m^3)				
				2013	2014	2015	2016	2017
2	Bus Station - Huddersfield	Other	240m NW	**43.4**	**45.0**	**46.7**	**41.6**	**42.3**
7	Westgate Huddersfield	Urban Centre	400m N	**46.3**	**42.8**	**44.8**	**38.8**	35.4
11	Chapel Hill Huddersfield	Roadside	150m SW	**41.2**	**41.6**	**42.4**	37.8	36.5
21	Castlegate Huddersfield	Roadside	400m NW	**45.2**	**43.9**	**44.9**	**45.1**	**40.1**
28	Ring Road Huddersfield	Roadside	430m NE	**51.8**	**49.0**	**54.7**	**53.1**	**55.9**

No continuous monitors were available in the local area to assist in the evaluation of PM10 concentrations.

Defra's Background Pollutant Concentration Mapping

Defra background maps indicate that background pollutant concentrations around the proposed development are below the respective annual mean objective thresholds for NO2, PM10, and PM2.5.

Background concentrations of NO2, PM10, and PM2.5 are currently within the objective thresholds and it is anticipated that they should improve over time due to the expected reduction in emissions from all emission sources.

4.5 Sensitive Residential Receptors

Sensitive residential receptors near the development were identified with reference to mapping data provided by Ordnance Survey and Kirklees Council's LAQM documents.

Sensitive residential receptors are located within 350 m of the red line boundary and within 50 m of the carriageway on the main approach routes to the site.

4.6 Other Local Authority Data

The latest revision of the Kirklees AQAP[3] contains a Detailed Assessment of air quality within Huddersfield Town Centre. Map C2.6 illustrates 2015 Modelled data for AQMA No.9 and is reproduced in Figure 3, which also indicates the position of the development site in relation to the AQMA, local monitoring sites and residential receptors. The map indicates that NO2 concentrations at the site are below 40 µg/m^3 NO2.

Impact Evaluation

Construction Phase Impacts

Need for a Detailed Assessment

An assessment was undertaken as there are 'human receptors' within 350 m of the boundary of the site; and 50 m of the route used by construction vehicles on the public highway, up to 500 m from the site entrance.

5.1.2 Risk of Dust Impacts Assessment

Dust Emission Magnitude Analysis

The dust emission magnitude is based on the scale of the anticipated work and classified as Table 7 below: the highest dust emission magnitude is likely to be Small.

Stage	Relevant Definition	Highest Potential Dust Emission Magnitude
Demolition	1. Assume that no significant demolition works are required	N/A
Earthworks	2. Minimal earthworks required, and worse case estimated site area is still <2,500 m^2 3. Soil is freely draining/loamy 4. Formation of stockpile enclosures <4 m in height 5. <5 heavy earth moving vehicles active at any one-time	Small
Construction	6. Estimated total building volume less than 25,000 m^3 7. Mainly internal works with some façade refurbishment	Small
Track out	8. <10 HDV (>3.5 tonnes) outward movements in any one day 9. Surface material with low potential for dust release 10. Unpaved road length < 50m	Small

Sensitivity of Areas Analysis

The sensitivity of the receptors and area has been defined for both dust soiling and human-health impact.

Receptor Sensitivity	Relevant Definition	Sensitivity of the Receptors	Relevant Definition	Sensitivity of the Area
Dust Soiling for Earthworks, Construction, Trackout	Dwellings	High	1-10 receptors within 50 m of site and routes used by construction traffic	Low
Human-Health Effects of PM_{10} for earthworks, construction, trackout	Dwellings	High	<24 µg/m^3 annual mean PM_{10} background concentration for 2017 and 2018 1-10 receptors within 50 m of site and routes used by construction traffic	Low

For the purposes of this assessment, ecological receptors are defined in accordance with the IAQM Guidance document and include RAMSAR sites, Special areas of conservation (SACs), potential SACs, candidate SACs, Special Protection Areas (SPAs), potential SPAs, Sites of Special Scientific Interest (SSSIs).

There are no ecological sensitive receptors within 50 m of the boundary of the site; and within 50 m of the route used by construction vehicles on the public highway, up to 50 m from the site entrance. Therefore, no further consideration of dust impact on ecological receptors has been undertaken.

Risk of Impact

The risk of dust impact to both dust soiling and human-health effects for each construction activities.

Potential Impact (Sensitivity of the Area)	Dust Risk (Dust Emission Category)				
	Demolition	Earthworks (Small)	Construction (Small)	Trackout (Small)	Overall Risk
Dust Soiling (low for earthworks, construction and trackout)	n/a	Negligible	Negligible	Negligible	n/a
Human-health (Low)	n/a	Negligible	Negligible	Negligible	n/a
Overall Risk	n/a	Negligible	Negligible	Negligible	Negligible

The dust impact assessment has demonstrated that the risk of dust soiling without any mitigation is negligible for earthworks, construction and trackout.

The risk of adverse human-health effects of PM10 without any mitigation is negligible for earthworks, construction and trackout.

The overall risk of impacts is **Negligible**.

Operation Phase
Human Exposure
Air quality conditions for future users of the proposed development have been considered below:

- 2015 Modelled data generated by Kirklees Council indicates air quality concentrations at the site are below 40µg/m^3 NO2.
- Latest monitoring data for the area suggests that air quality concentrations at the site are likely to range between the NO2 concentrations measured at sites 7 and 11, i.e. 35.4 to 36.5 µg/m^3 NO2

As the annual mean nitrogen dioxide concentration is below 60µg/m^3, this means that the short-term (1-hour) mean nitrogen dioxide concentration will meet the air quality objective threshold value (see Table 3 with explanatory note).

Defra modelled PM10 backgrounds for the site are in the order of 12-13 µg/m^3, therefore it is considered unlikely that these will impose any constraints with respect to exposure at the development of the site.

Mitigation

Construction

The primary aim of the dust risk assessment is to identify the appropriate site-specific mitigation measures that will be adopted to ensure there will be no significant effect on local amenity and public health.

Although the site has been identified as low risk with and potential impacts have been identified as negligible, the WYLES planning document recommends the adoption of best practice dust control measures. Full details of suitable mitigation measures are presented in Appendix D.

It is anticipated that the dust generation and harmful emissions from construction site activities will be further reduced with the correct implementation of the best practice methods identified.

Operation

The allocated parking provision of eight parking/student drop off bays falls below the threshold level required for electric vehicle charging points in the WYLES planning guidance document. However, other operation phase mitigation measures are set out in the supporting Transport Statement and include measures to promote walking, cycling, the use of public transport and initiatives to reduce vehicle use.

As air quality is unlikely to be unconstrained at the development site, no additional mitigation measures are required to protect future occupants of the development from poor air quality.

Conclusion

The assessment has demonstrated that air quality at the development site is likely to be suitable for the proposed development, and that the operation phase of the development will not give rise to significant air quality impacts. Following implementation of the best practise mitigation measures proposed within this report, it is concluded that there are no air quality constraints to the proposed development.