

Leicester Local Plan

Action 64 Technical note explaining potential effect on Air Quality from the development of Beaumont Park (SL06, Site 464)

Background

Inspectors have requested information about assessment of air quality implications in respect of Site 464 Beaumont Park.

Summary

The technical Report appended as Annex A was submitted to the Council for consideration in June 2020.

The planning authority is satisfied that the assessment conclusions reached as set out in the Recommendations and Conclusions section as copied below are sufficiently robust to support allocation of the site.

Recommendations and Conclusions

Air Quality

Based on the results of the dispersion modelling and taking into consideration local representative monitoring data in the vicinity of the Site, it is considered that air quality within the Site is suitable for the proposed uses.

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Beaumont Park
Technical Note
June 2020
NTD0046

BWB

Given the size of the Site and the development proposals, it is anticipated that a detailed road traffic impact assessment will be required to support any future planning application. This assessment should determine the impact of development-generated traffic on local air quality at existing sensitive receptors and the AQMA. Depending on whether sensitive uses are proposed for any future planning application, modelling may also be required to predict pollutant concentrations across the Site in future occupation years. A qualitative construction phase dust assessment should be undertaken to identify dust mitigation measures proportionate to the potential dust risk associated with construction phase activities.

Odour

The Site is located adjacent to a number of potential odour sources. Taking into consideration the nature of odours experienced during the Site walkover, it is considered unlikely that odour will significantly influence the Site. It is recommended that consultation with the Environmental Health department at LCC is undertaken prior to submission of any planning application to determine the requirement for a more detailed assessment of identified odour sources and identify any new operations in the area that may change the odour environment from the existing.

Further more detailed work will be developed to support decision taking should the allocation be confirmed and the detailed scheme design be progressed

Annex A

BWB Beaumont Park Air Quality and Odour Technical Note

BEAUMONT PARK

TECHNICAL NOTE

Project	Beaumont Park		
Document Number	BP-BWB-VUT-ZZ-RP-G-0001_TN	BWB Ref	NTD2046
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Checked	Claire Meddings MSc, BSc (Hons), CSci, MIAQM, MIEEnvSc	Revision	1.0
Approved	Claire Meddings MSc, BSc (Hons), CSci, MIAQM, MIEEnvSc	Date	26/06/2020

Introduction

BWB Consulting Ltd was appointed by Leicester City Council (LCC) to provide an appraisal of the Site at Beaumont Park ("the Site") with regard to air quality and odour. The aim of this appraisal is to highlight the potential air quality and odour constraints to the development of the Site and identify the likely assessment work required to support any future planning applications.

This report forms an initial assessment of potential air quality and odour constraints based on the following sources of information:

- A review of Air Quality Constraints Assessment¹ prepared by Arcadis in 2017;
- A review of OS mapping and online aerial imagery;
- A review of local air quality monitoring data;
- A review of the local authority planning portal;
- A site walkover undertaken on 16/06/2020 to experience the odour environment present at the Site during the walkover; and
- Preliminary dispersion modelling utilising available monitoring and traffic data.

No consultation was undertaken with LCC or other local stakeholders or authorities during the appraisal. The appraisal is based on the most recent, freely available information and one Site walkover.

Site Description

The Site lies within the administrative area of LCC and covers part of the Beaumont Park public park. The Site comprises woodland and open grassed areas with a network of public footpaths crossing the Site.

The Site lies approximately 1.5km west of the Leicester city Air Quality Management Area (AQMA) which was declared by LCC for the potential exceedance of the annual mean nitrogen dioxide (NO₂) objective. The AQMA covers the city centre of Leicester and radial roads.

¹ Arcadis (2017) Air Quality Constraints Assessment Site 2: Beaumont Park

To the north of the Site lies the northern area of Beaumont Park, Leicester Tigers Speedway track and a number of industrial and commercial premises including Walkers Snacks manufacturing facility. The eastern boundary of the Site lies adjacent to Beaumont Leys Lane with residential dwellings beyond. To the south of the Site lies the A563 Krefeld Way with residential dwellings and Babington Community College beyond. To the west of the Site lies the Beaumont Leys retail park, offices and the De Montfort University sports complex. The Site location, AQMA and identified potential odour sources in the vicinity of the Site are illustrated in **Figure 1**.

Site Proposals

It is understood that the Site will be promoted for employment use; however consideration was given to pollutant concentrations within the Site should LCC wish to consider the Site for more sensitive uses, such as residential, in the future.

Figure 1: Site Location

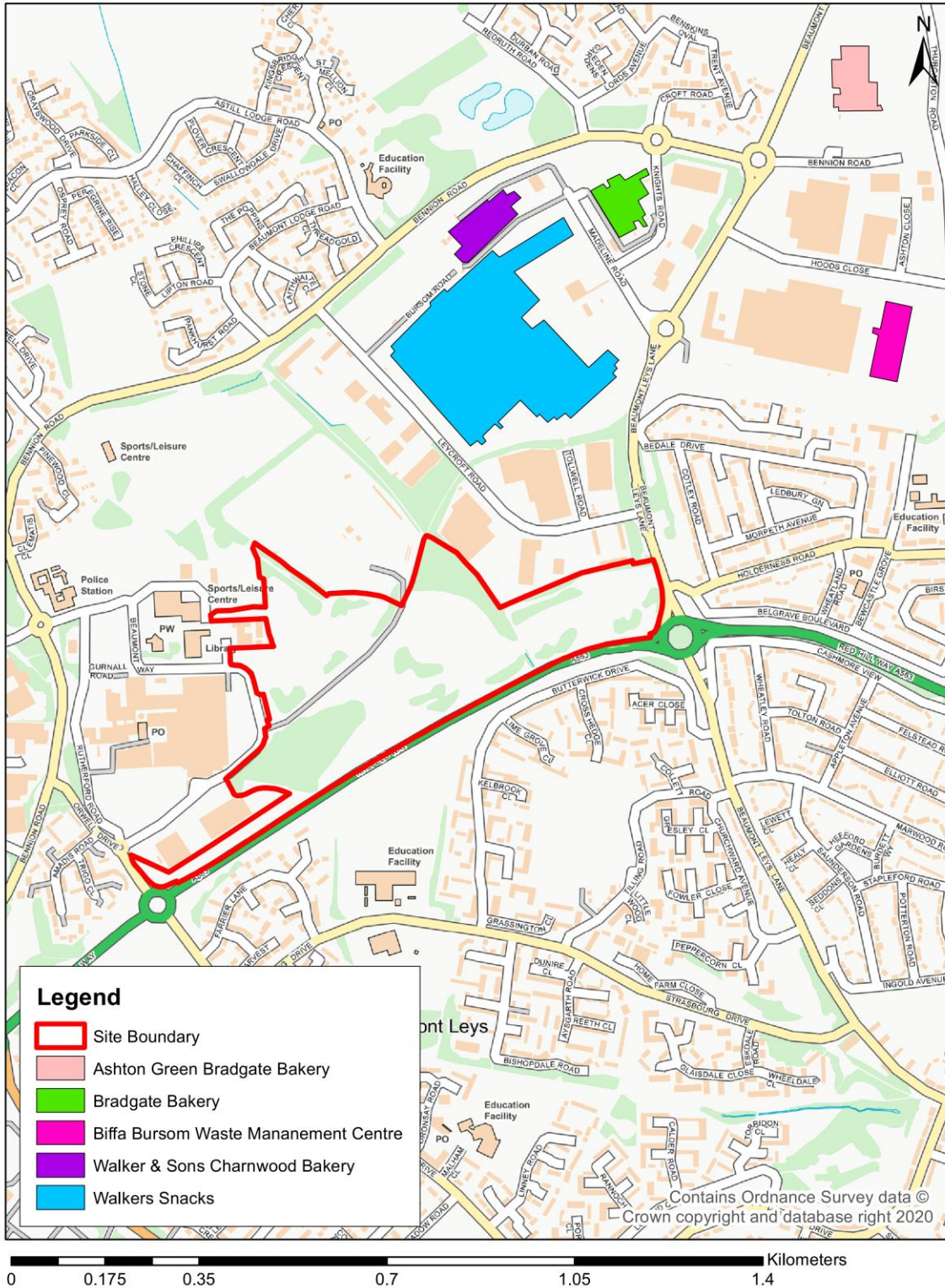


Figure 1: Site Location and Identified Odour Sources

Drawn by: FH
 Date: 19/06/2020

Review of Previous Constraints Assessments

A review of the constraints assessment¹ previously prepared for the Site was undertaken to provide context of previous air quality and odour constraints and enable comparison with the existing conditions at the Site and in the local area.

The original constraints assessment¹ was prepared in 2017 and therefore, monitoring data and background concentrations presented in the report are no longer the most recent data available.

The report¹ concluded that air quality within the Site was likely to be suitable for the proposed uses however, the areas adjacent to the A563 Krefeld Way required further consideration and a detailed air quality assessment would be required for planning to determine the potential impact of development-generated traffic on local air quality.

The previous constraints assessment¹ did not include consideration of odour from nearby operations. Therefore, an analysis of the potential for odorous emissions from nearby operations to influence amenity within the Site was undertaken in this assessment.

Primary Constraints – Air Quality

The predominant source of pollutants in the vicinity of the Site is considered to be road traffic emissions, with the A563 Krefeld Way located adjacent to the southern boundary of the Site. Emissions from road traffic travelling on the local road network has the potential to influence pollutant concentrations within the Site.

Local Air Quality Management

The Site is located approximately 1.5km west of the Leicester AQMA which was declared by LCC for the potential exceedance of the annual mean NO₂ objective.

Local Air Quality Monitoring

Nitrogen Dioxide (NO₂)

LCC undertakes NO₂ monitoring within their administrative areas. However, the LCC monitoring is not considered representative of conditions at the Site as they are located within the AQMA in the city region whilst the Site is located in a more suburban setting.

The closest monitoring to the Site is undertaken by the neighbouring local authority Charnwood Borough Council (CBC). The monitoring locations closest to the Site are considered more representative of conditions at the Site as they are located in a similar suburban setting. **Table 1** details the results of NO₂ monitoring at the closest monitoring locations to the Site.

Table 1: Annual Mean NO₂ Monitoring Data 2014 – 2018

Monitoring Location	Grid Reference		Site Type	Distance from Site	Concentration (µg.m ⁻³)				
					2014	2015	2016	2017	2018
DT22 Loughborough Road	459233	309233	Roadside	2.1km northeast of Site	30.5	28.5	32.3	33.7	26.3

Monitoring Location	Grid Reference		Site Type	Distance from Site	Concentration ($\mu\text{g}\cdot\text{m}^{-3}$)				
					2014	2015	2016	2017	2018
DT23 A6 (Birstall)	459178	309890	Roadside	2.5km northeast of Site	33.1	30.2	34.1	35.6	29.4

The monitored annual mean NO_2 concentrations in the vicinity of the Site were all below the annual mean objective for the past five years of monitoring data available for review.

Particulate Matter (PM_{10} and $\text{PM}_{2.5}$)

No monitoring of PM_{10} or $\text{PM}_{2.5}$ is undertaken in the vicinity of the Site or in areas considered representative of conditions at the Site.

Background Pollutant Concentrations

Background pollutant concentrations were obtained from the latest Defra background concentration maps², which are provided for the UK as a 1km x 1km grid network. The latest maps are based on 2017 monitoring and meteorological data. Background concentrations of NO_2 , PM_{10} and $\text{PM}_{2.5}$ were obtained for the grid squares covering the Site. The background concentrations used in the assessment are detailed in **Table 2**.

Table 2: Background Pollutant Concentrations at the Site

Pollutant	Grid Square	Location	2020 Concentration ($\mu\text{g}\cdot\text{m}^{-3}$)
NO_2	456500, 307500	Site	20.2
PM_{10}			14.5
$\text{PM}_{2.5}$			9.7
NO_2	457500, 307500	Site	17.2
PM_{10}			14.4
$\text{PM}_{2.5}$			9.8
NO_2	456500, 308500	Site	18.2
PM_{10}			14.4
$\text{PM}_{2.5}$			9.8

² Defra (2019) background pollutant concentration maps [<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017>]

Pollutant	Grid Square	Location	2020 Concentration ($\mu\text{g}\cdot\text{m}^{-3}$)
NO ₂	457500, 308500	Site	21.0
PM ₁₀			14.5
PM _{2.5}			9.9

Background concentrations across the Site are below the relevant annual mean objectives for NO₂, PM₁₀ and PM_{2.5}.

Preliminary Road Traffic Emissions Exposure Assessment

The Site is being promoted for employment use which is not considered a sensitive use with regard to air quality. However, to advise LCC on the potential suitability of the Site for alternative sensitive uses such as residential, a detailed road traffic emissions modelling exercise was undertaken to predict concentrations of NO₂, PM₁₀ and PM_{2.5} across the Site.

Modelling Methodology

A preliminary detailed operational phase road traffic emissions assessment was undertaken to predict pollutant concentrations at the proposed development Site. The dispersion model ADMS-Roads was used to model concentrations of oxides of nitrogen (NO_x) and particulate matter (PM₁₀ and PM_{2.5}) across the Site to determine the suitability of the Site for the proposed use. The assessment was undertaken in accordance with Defra Local Air Quality Management Technical Guidance (LAQM.TG16)³ and pollutant concentrations were compared to the relevant air quality objectives.

The latest version of the Defra tools including the Emissions Factor Toolkit⁴, background concentration maps² and NO_x-NO₂ Calculator⁵.

Meteorological data from the East Midlands Airport recording station was used in the assessment and the model outputs were verified utilising local monitoring data in the vicinity of the Site.

The following scenarios were modelled:

- 2018 Verification; and
- 2020 Current Year.

Traffic data was obtained from the Department for Transport website⁶ for the following links:

- A563 Krefeld Way;
- A563 Red Hill Way;

³ Defra (2018) Local Air Quality Management Technical Guidance LAQM.TG(16)

⁴ Defra (2019) Emission Factor Toolkit [https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html]

⁵ Defra (2019) NO_x to NO₂ Calculator [https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc]

⁶ Department for Transport, traffic counts website https://roadtraffic.dft.gov.uk/ [accessed May 2020]

- A5630 Anstey Lane; and
- Beaumont Leys Lane.

Assessment Criteria

Predicted pollutant concentrations were compared to the relevant air quality objectives. The current relevant air quality standards and objectives⁷ are detailed in **Table 3**.

Table 3: Air Quality Standards and Objectives (England)

Pollutant	Averaging Period	Air Quality Objective ($\mu\text{g.m}^{-3}$)	Date to Achieve by
NO ₂	Annual Mean	40	31 December 2005
	1-hour mean not to be exceeded more than 18 times per year	200	31 December 2005
PM ₁₀	Annual Mean	40	31 December 2004
	24-hour mean not to be exceeded more than 35 times per year	50	31 December 2004
PM _{2.5}	Annual mean target (15% cut in annual mean (urban background exposure))	25	2010 - 2020

In determining the significance of exposure to air pollution and the levels of mitigation required, the APPLE⁸ Air Pollution Exposure Criteria (APEC) were also referred to. Whilst originally intended for development in London, they can be used as part of a precautionary approach for developments across the UK. The criteria indicate that, where pollutant concentrations at a receptor location are expected to be within 5% of the objectives listed in **Table 3**, there may be sufficient air quality grounds for refusal, without appropriate mitigation included.

Preliminary Site Suitability Assessment

A preliminary site suitability assessment was undertaken to predict concentrations of NO₂, PM₁₀ and PM_{2.5} across the Site to consider the suitability of the Site for sensitive uses. A grid was modelled across the Site to enable the production of contour plots to indicate the pattern of pollutant dispersion across the Site.

The modelled grid of receptors points covered an area between the following grid references: minimum 456363, 307484 to maximum 457512, 308323 and was modelled across a grid of 50 x 50 points at standard breathing height (1.5m). The source-oriented grids function of ADMS-Roads was also used, which creates additional points in the vicinity of pollution sources (roads), to increase the fidelity of the data in these areas.

Figures 2, 3 and 4 illustrate annual mean pollutant concentration contours from NO₂, PM₁₀ and PM_{2.5} respectively.

⁷ Department of the Environment, Food and Rural Affairs (Defra) (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, London: HMSO

⁸ The London Air Pollution Planning and the local Environment (APPLE) Working Group. (2007). Air Quality and Planning Guidance.

Figure 2: Annual Mean NO₂ Concentrations across the Site

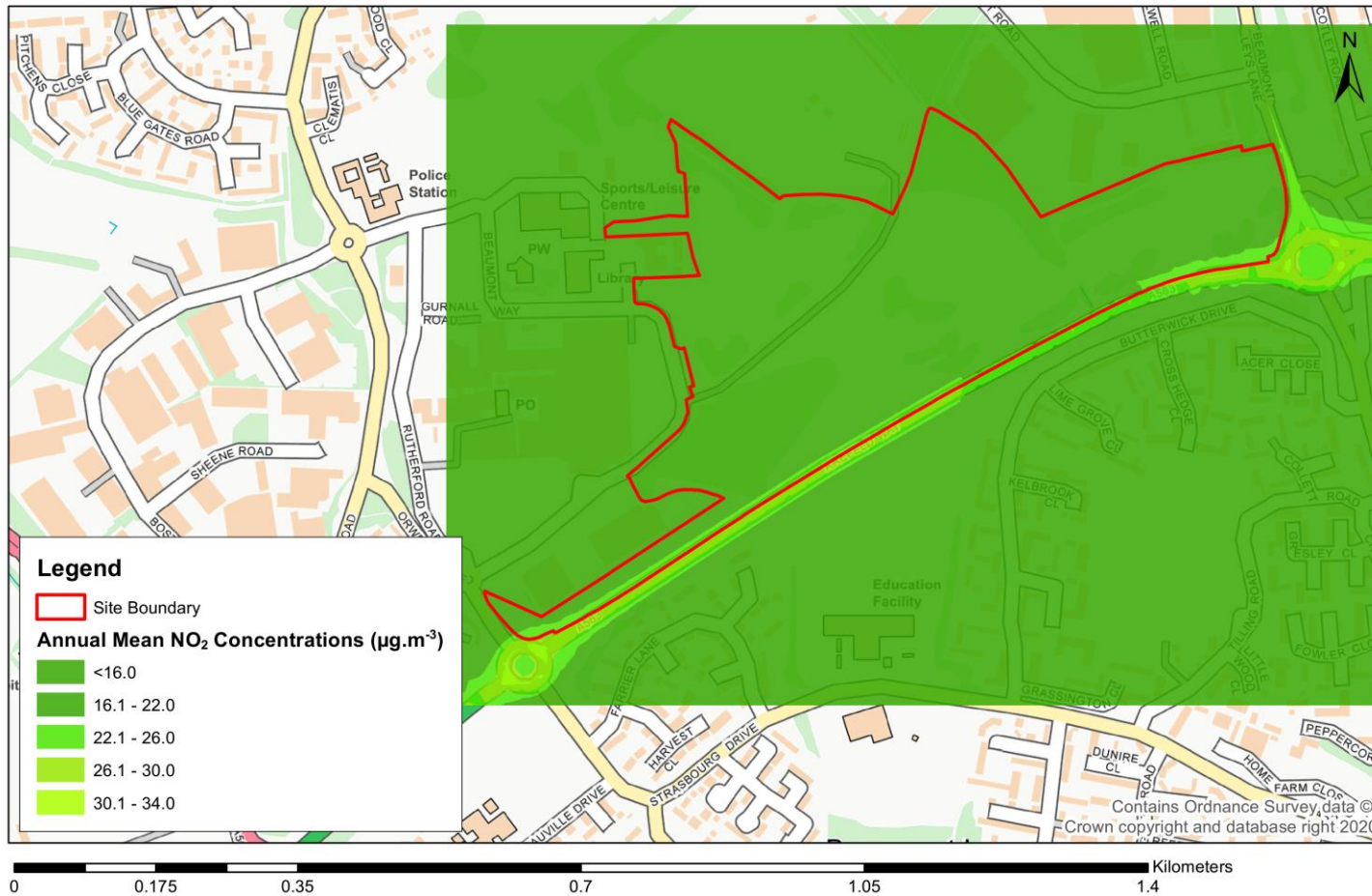


Figure 2: Annual Mean NO₂ Concentrations Across the Site

Drawn by: FH
 Date: 19/06/2020

Figure 3: Annual Mean PM₁₀ Concentrations across the Site

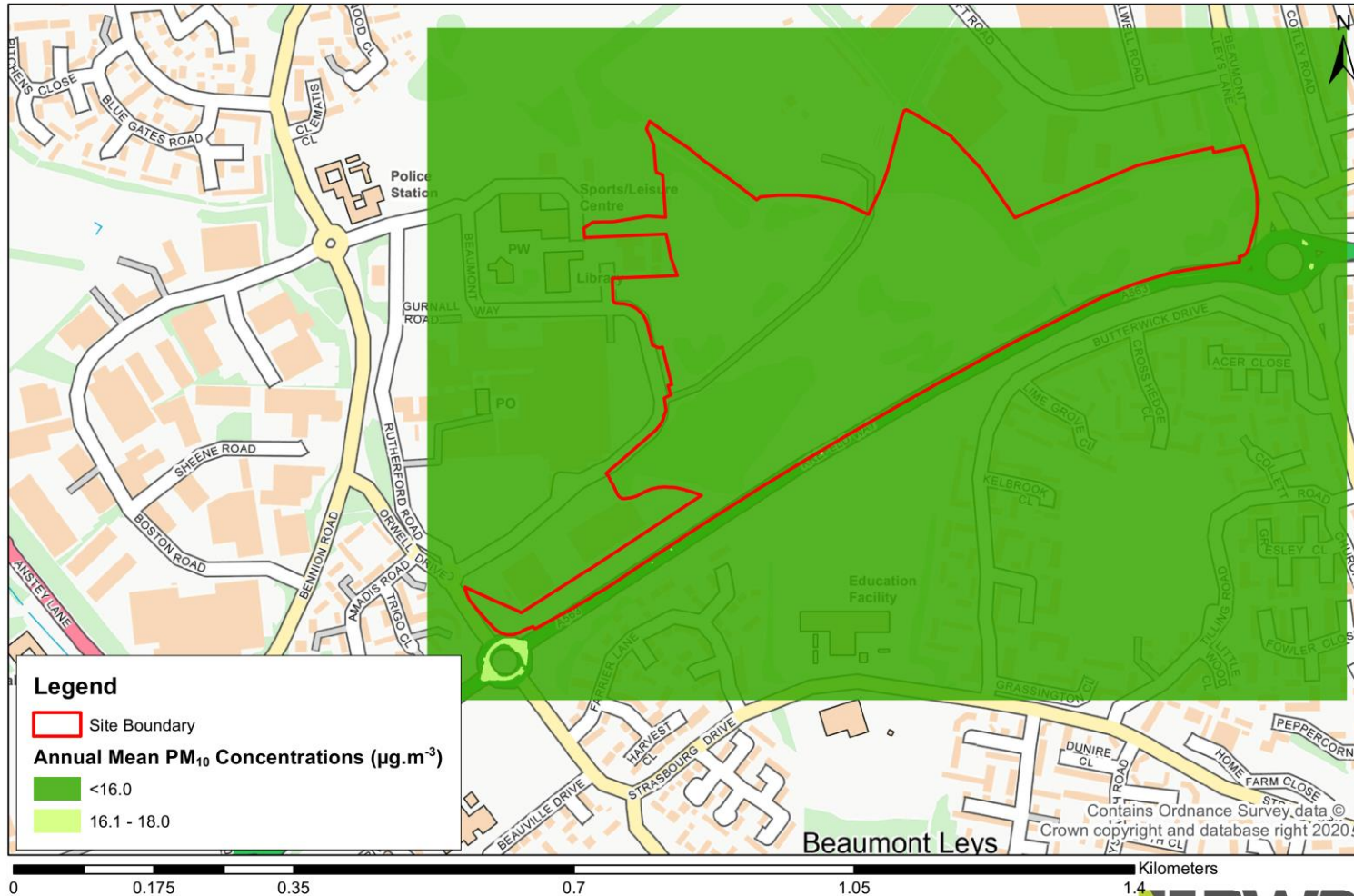


Figure 3: Annual Mean PM₁₀ Concentrations Across the Site

Drawn by: FH
Date: 19/06/2020

Figure 4: Annual Mean PM_{2.5} Concentrations across the Site

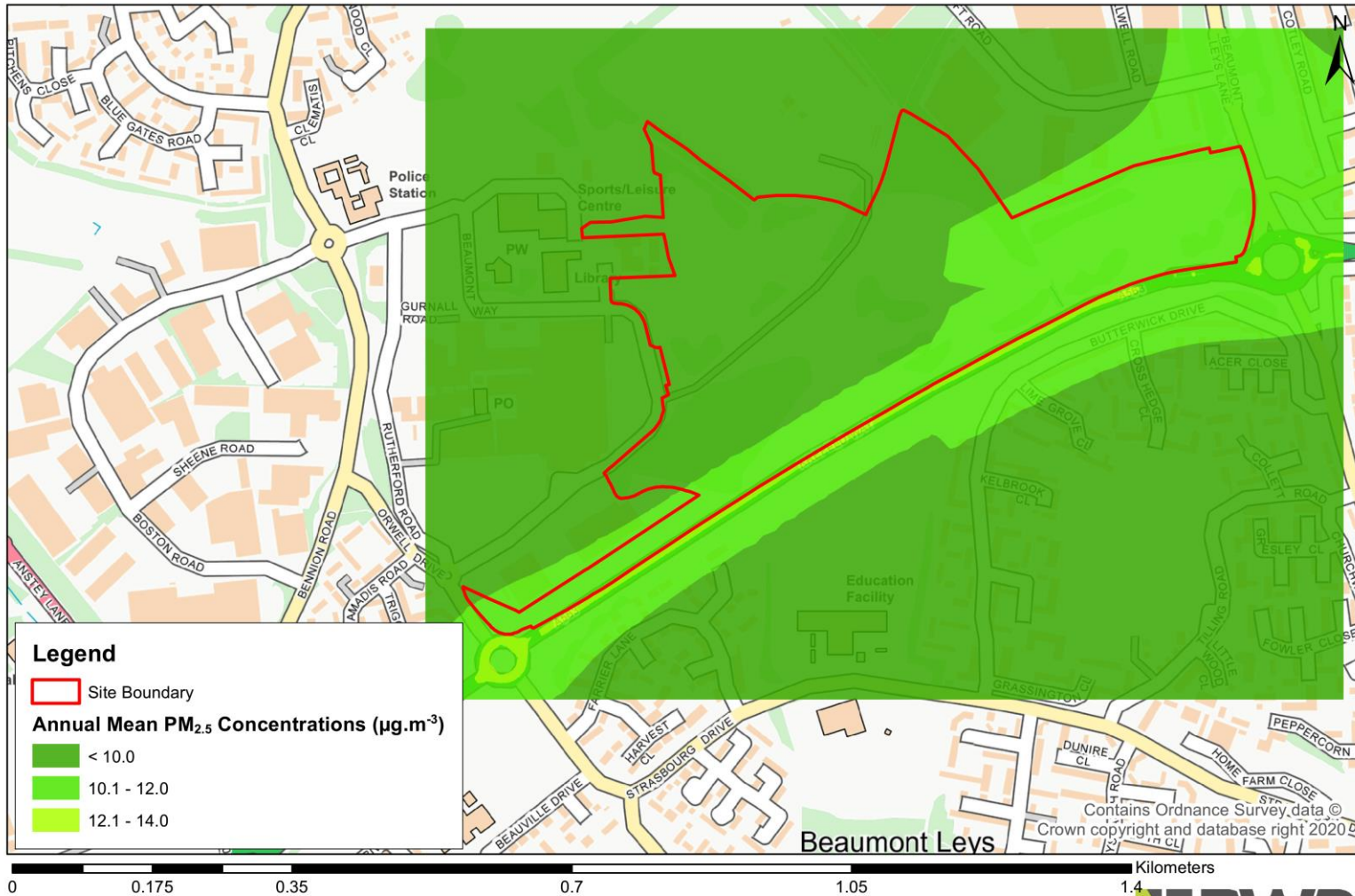


Figure 4: Annual Mean PM_{2.5} Concentrations Across the Site

Drawn by: FH
Date: 19/06/2020

Figures 2, 3 and 4 illustrate that annual mean NO₂, PM₁₀ and PM_{2.5} concentrations across the Site are predicted to be below the relevant annual mean objectives.

With regard to short term air quality objectives for NO₂ at the Site, the predicted annual mean NO₂ concentrations within the Site are less than 60µg.m⁻³ and therefore in accordance with Defra guidance³ it may be assumed that exceedance of the 1-hour mean NO₂ objective are unlikely.

With regard to the short term air quality objectives for PM₁₀ at the Site, the predicted calculation detailed in Defra guidance³ was used to determine potential exceedance of the 24-hour PM₁₀ short term objective; no exceedances were predicted.

Overall, it is considered that the Site is appropriate for sensitive uses with regard to air quality.

Primary Constraints – Odour

The predominant sources of odour in the vicinity of the Site are considered to be the Walkers Snacks manufacturing facility approximately 200m north of the Site, the Walker & Sons Charnwood Bakery located approximately 520m north of the Site, the Bradgate Bakery approximately 620m northeast of the Site, the Biffa Bursom Waste Management Centre located approximately 500m northeast of the Site and the Ashton Green (Bradgate) Bakery located approximately 900 northeast of the Site.

The potential odour source near the Site are identified in **Figure 1**.

Potential Sources of Odour

A summary of each potential odour source identified is detailed below.

Ashton Green (Bradgate) Bakery

The Ashton Green (Bradgate) Bakery is located on Bennion Road, approximately 900m northeast of the Site. The bakery has the potential to give rise to odorous emissions as a result of baking processes undertaken at the site. Odorous emissions from the bakery have the potential to influence amenity at proposed nearby sensitive uses within the Site.

Biffa Bursom Waste Management Centre

The Biffa Bursom Waste Management Centre is located on Hoods Close, approximately 500m northeast of the Site. Refuse lorries accessing the centre, and processes at the centre, have the potential to give rise to odorous emissions.

Bradgate Bakery

The Bradgate Bakery is located on Madeline Road, approximately 620m northeast of the Site. The bakery has the potential to give rise to odorous emissions as a result of baking processes which may influence amenity at proposed nearby sensitive uses within the Site.

Walker & Sons Charnwood Bakery

The Walker & Sons Charnwood Bakery is located on Madeline Road, approximately 520m north of the Site. The bakery has the potential to give rise to odorous emissions as a result of baking processes which may influence amenity at proposed nearby sensitive uses within the Site.

Walkers Snack Manufacturing Facility

The Walkers Snacks manufacturing facility is located on Leycroft Road approximately 200m southwest of the Site. The facility predominantly produces crisps and therefore, has the potential to give rise to odorous emissions from the baking and frying processes undertaken at the facility.

Odour Survey Results

BWB attended the Site on 16/06/2020 and a Site walkover was undertaken to determine whether any odorous emissions were detectable in the Site or the vicinity. The Site walkover was undertaken around the Site within the Site boundary (where publicly accessible), across the Site and around the identified potential odour sources.

Figure 5 identifies the route taken during the Site walkover to experience any possible odours within, and adjacent to, the Site. During the Site walkover, all potential odour sources were operational.

Figure 5: Odour Site Survey Walkover Route

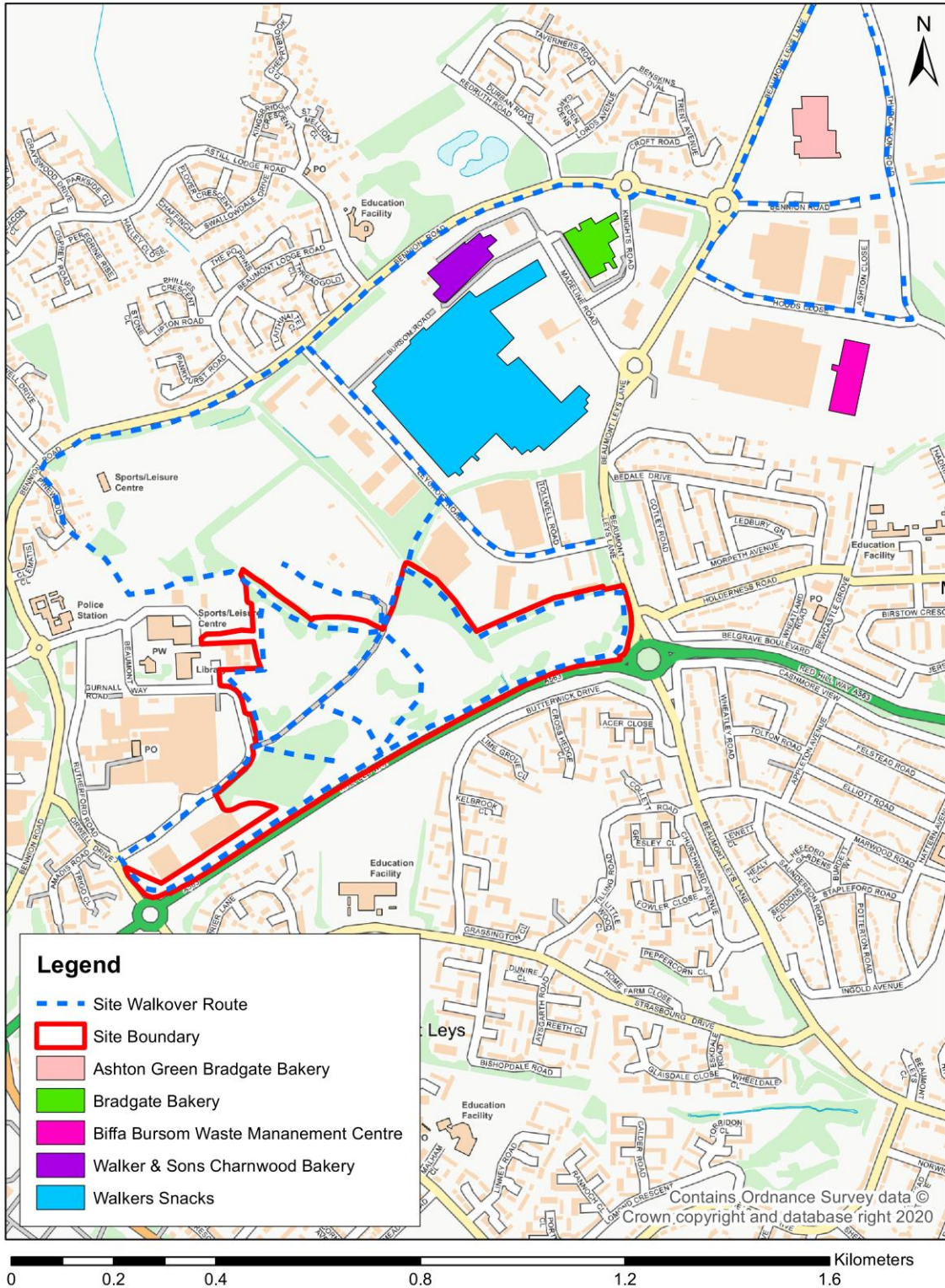


Figure 5: Odour Site Survey Wakover Route

Drawn by: FH
 Date: 19/06/2020

Odours experienced throughout the majority of the Site were of a grass-like nature with evidence of grass mowing and grass cuttings across the Site. On surveying from the northeastern boundary of the Site towards Leycroft Lane, a faint frying / cooking smell was detected which grew stronger as the surveyor walked along Leycroft Lane towards where the Walkers Snacks manufacturing facility is located.

No odorous emissions attributable to the Walkers Snack manufacturing facility were detected within the Site. It was therefore considered that odorous emissions from the Walkers Snacks manufacturing facility are unlikely to significantly influence amenity at the Site given the distance between the Site and the source of the odour.

No odour attributable to any of the other identified odour sources was detected within the Site or along the site walkover route.

The Site is currently being promoted for employment use which, whilst sensitive to odours, is not considered as sensitive as uses such as residential, due to the lower level of amenity typically expected at a place of work. Taking into consideration the findings of the odour site walkover and the proposed use of the Site, it is therefore considered unlikely that odours from the identified potentially odorous operations will significantly influence amenity within the Site.

Limitation of Assessments

Air Quality

Dispersion modelling was undertaken using traffic data from freely available sources and did not include any specific significant local developments or consideration of future scenarios. Future traffic levels are anticipated to change from those utilised in the assessment and therefore to support a future planning application, modelling should be undertaken for future scenarios when an anticipated operational year is known.

Odour

The odour survey was undertaken during a period of warm, dry weather which was considered suitable to undertake an initial odour assessment. However, it is accepted that odour surveys only represent a snapshot of conditions at the time of assessment and conditions may vary depending on wind direction, weather and seasonal variation. IAQM guidance recommends that three separate odour surveys are taken for inform odour assessments for submission with planning applications, however for this appraisal a single site visit was conducted. It should be noted that odours from existing operations were considered in the assessment and that any new potentially odorous processes that may operate in the future may require consideration in any future planning applications.

Recommendations and Conclusions

Air Quality

Based on the results of the dispersion modelling and taking into consideration local representative monitoring data in the vicinity of the Site, it is considered that air quality within the Site is suitable for the proposed uses.

Given the size of the Site and the development proposals, it is anticipated that a detailed road traffic impact assessment will be required to support any future planning application. This assessment should determine the impact of development-generated traffic on local air quality at existing sensitive receptors and the AQMA. Depending on whether sensitive uses are proposed for any future planning application, modelling may also be required to predict pollutant concentrations across the Site in future occupation years. A qualitative construction phase dust assessment should be undertaken to identify dust mitigation measures proportionate to the potential dust risk associated with construction phase activities.

Odour

The Site is located adjacent to a number of potential odour sources. Taking into consideration the nature of odours experienced during the Site walkover, it is considered unlikely that odour will significantly influence the Site. It is recommended that consultation with the Environmental Health department at LCC is undertaken prior to submission of any planning application to determine the requirement for a more detailed assessment of identified odour sources and identify any new operations in the area that may change the odour environment from the existing.