

Lighting Assessment
Redevelopment of Deacon Business Park

Client: EEIP II Arundel Propco 2 Holdings Limited

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Executive Summary

Redmore Environmental Ltd was commissioned by EEIP II Arundel Propco 2 Holdings Limited to undertake a Lighting Assessment in support of a commercial development on land at Deacon Business Park, Moorgate Road North, Knowsley.

Artificial lighting associated with the development has the potential to cause impacts at existing sensitive receptors in the vicinity of the site. As such, a Lighting Assessment was undertaken to consider the likely effects.

A baseline study, including desk top information review, was undertaken to determine existing conditions in the vicinity of the site.

The exact level of artificial light experienced at nearby sensitive receptors will depend on the final design. At the time of reporting, information on the lighting design for the scheme was not available. As such, light impacts could not be predicted for comparison with the relevant criteria. A qualitative assessment of potential effects was therefore undertaken and further work suggested for inclusion as a planning condition, if deemed necessary.

The results of the assessment indicated that it was considered unlikely that luminaires associated with the proposals would cause a noticeable change in lighting levels at existing receptors in the vicinity of the site. As such, impacts associated with the development are not predicted to be significant. However, a number of mitigation options were identified which should be incorporated into any future lighting design strategy in order to minimise potential effects associated with the proposals. A suitable planning condition was also produced to provide further reassurance that impacts associated with the development will not be significant.

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1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by EEIP II Arundel Propco 2 Holdings Limited to undertake a Lighting Assessment in support of a commercial development on land at Deacon Business Park, Moorgate Road North, Knowsley.

1.1.2 Artificial lighting associated with the development has the potential to cause impacts at existing sensitive receptors in the vicinity of the site. As such, a Lighting Assessment was undertaken to consider the likely effects.

1.2 Site Location and Context

1.2.1 The site is located on land at Deacon Business Park, Moorgate Road North, Knowsley, at approximate National Grid Reference (NGR): 342544, 397584. Reference should be made to Figure 1 for a site location plan.

1.2.2 The proposals comprise the demolition of existing industrial accommodation and erection of warehouse (Use Class B8) with ancillary offices (Use Class E(g)), reconfigured points of access, new security gatehouses and associated works.

1.2.3 The development requires provision of suitable fixtures to provide sufficient lighting to future users. These have the potential to cause increases in ambient lighting levels at existing sensitive receptor locations within the vicinity of the site. Baseline conditions have therefore been defined within this report, potential impacts considered and relevant mitigation parameters identified.

2.0 LIGHTING BACKGROUND

2.1 Documents Consulted

2.1.1 The following legislation and guidance was used in this assessment:

- Guidance Notes for the Reduction of Obtrusive Light GN01/21, The Institution of Lighting Practitioners (ILP), 2021;
- Lighting in the Countryside: Towards Good Practice, Department for Communities and Local Government, 1997;
- Clean Neighbourhoods and Environment Act, 2005; and,
- Environmental Protection Act, 1990.

2.2 Legislative Framework

2.2.1 Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (1990). This was amended to include the following nuisance definition:

"(fb) artificial light emitted from premises so as to be prejudicial to health or nuisance;"

2.2.2 Although light was described as a statutory nuisance, no prescriptive limits or rules have been set for assessment. Guidance produced by the International Commission on Illumination (CIE), ILP and the Chartered Institute of Building Services Engineers (CIBSE) have been referred to whilst undertaking this assessment.

2.2.3 The Lighting in the Countryside: Towards Good Practice guidance produced by the Department for Communities and Local Government aims to identify good practice in the planning and design of rural areas and advises on how this can be achieved. The document states:

"Lighting itself is not a problem; it only becomes a problem when it is excessive, poorly designed or badly installed."

- 2.2.4 The document provides advice on how to reduce impacts associated with development, as well as identifying relevant considerations for environmental assessments. Although it is noted the site is not located in a rural area, the guidance provides useful background to lighting assessment and has therefore been considered throughout this report as necessary.

2.3 National Planning Policy Framework

- 2.3.1 The revised National Planning Policy Framework¹ (NPPF) was published in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

- 2.3.2 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

[...]

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."

- 2.3.3 The implications of the NPPF have been considered throughout this assessment.

2.4 National Planning Practice Guidance

- 2.4.1 The National Planning Practice Guidance² (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 and updated

¹ NPPF, Ministry of Housing, Communities and Local Government, 2021.

² <https://www.gov.uk/guidance/light-pollution>.

on 1st November 2019 to support the NPPF and make it more accessible. The light pollution pages are summarised under the following headings:

1. What light pollution considerations does planning need to address?
2. What factors can be considered when assessing whether a development proposal might have implications for light pollution?
3. What factors are relevant when considering where light shines?
4. What factors are relevant when considering when light shines?
5. What factors are relevant when considering how much the light shines?
6. What factors are relevant when considering possible ecological impacts of lighting?
7. What other information is available that could inform approaches to lighting and help reduce light pollution?

2.4.2 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

2.5 Local Planning Policy

2.5.1 The Knowsley Replacement Unitary Development Plan³ was adopted by Knowsley Metropolitan Borough Council (KMBC) in June 2006.

2.5.2 A review of the document was undertaken in order to identify any planning policies relevant to the assessment. This indicated the following:

"Policy DQ: Security in the Built Environment

[...]

2. Security features such as fencing, walls, CCTV cameras and lighting (both in new developments and where proposed to provide added security to existing developments) should be designed so as to avoid causing harm to:

[...]

³ Knowsley Replacement Unitary Development Plan, KMBC, 2006.

b) The amenities of occupiers of nearby property; [...]"

"Policy ENV3: Light Pollution

Development requiring external lighting must satisfy the following criteria:

- a) The lighting scheme proposed is the minimum required for security and working purposes to undertake the task;
- b) There would be no unacceptable impact on visual amenity in the surrounding area;
- c) The scheme will not have an unacceptable effect on road safety;
- d) The scheme will not harm wildlife; and,
- e) There will be no unacceptable loss of residential amenity."

2.5.3 The above policies have been taken into consideration throughout the undertaking of the assessment.

3.0 **METHODOLOGY**

3.1 **Introduction**

3.1.1 The Lighting Assessment included the establishment of baseline ambient light conditions and an evaluation of associated impacts. The methodology for each element of the assessment is outlined in the following subsections.

3.2 **Baseline**

3.2.1 Existing lighting conditions in the vicinity of the development site were identified in order to provide a reference for assessment. The Lighting in the Countryside⁴ document states the following items should be considered during the determination of a baseline:

- A review of the area and landscape together with any designations;
- An overview of existing lighting;
- Identification of potential receptors; and,
- Environmental Zone Classification.

3.2.2 These were considered by undertaking a detailed desk-top study using relevant mapping resources.

3.2.3 The ILP has developed an Environmental Zone classification system for the categorisation of assessment locations. This is summarised in Table 1.

Table 1 Environmental Zone Classification

Environmental Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness areas	Village or relatively dark outer suburban locations

⁴ Lighting in the Countryside; Towards Good Practice, Department for Communities and Local Government, 2005.

Environmental Zone	Surrounding	Lighting Environment	Examples
E3	Suburban	Medium district brightness areas	Small town centres or suburban locations
E4	Urban	High district brightness areas	Town/city centres with high levels of night-time activity

3.2.4 The criteria shown in Table 1 were utilised to determine the most appropriate Environmental Zone for the development location.

3.3 Assessment Criteria

3.3.1 Luminaires have the potential to cause light trespass and contribute to sky glow. For each Environmental Zone, as defined in Table 1, obtrusive light limitations for exterior lighting installations have been determined by the ILP⁵. These are summarised in Table 2.

Table 2 Obtrusive Light Limitations for Exterior Lighting Installations

Environmental Zone	Sky Glow Upward Light Ratio ^(a) (%)	Light Trespass (into Windows) E_v (lux) ^(b)		Source Intensity I (kcd)		Building Luminance Pre-curfew Average $L^{(c)}$ (cd/m ²)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	
E0	0.0	0	0	0	0	< 0.1
E1	0.0	2	0 (1*)	2,500	0	< 0.1
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15.0	25	5	25,000	2,500	25

Note: (a) ULR of the installation - maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

(b) Vertical Illuminance measured flat at the glazing at the centre of the window.

(c) Luminance.

(d) From public road lighting installations only.

⁵ Guidance Notes for the Reduction of Obtrusive Light GN01/21, ILP, 2021.

3.3.2 The obtrusive light limitations shown in Table 2 have been used to define the relevant mitigation required to ensure impacts associated with the development are not significant.

4.0 **BASELINE**

4.1 **Introduction**

4.1.1 Existing conditions in the vicinity of the development site were identified in order to provide a baseline for assessment. These are detailed in the following Sections.

4.2 **Surrounding Area**

4.2.1 The development is located to the north-east of Liverpool city centre within Deacon Business Park, Knowsley. The site is bordered to the north, east and south by industrial warehouses and to the west by the A5207 - Moorgate Road North with residential dwellings beyond.

4.2.2 There are a number of residential properties to the west of the proposals. These have been defined as sensitive receptor locations, as outlined in Table 3 and shown in Figure 2.

Table 3 Sensitive Receptor Locations

Receptor		Sensitivity	Distance from Boundary (m)	NGR (m)	
				X	Y
R1	Residential - Moorgate Road North	High	40	358910.2	400379.4
R2	Residential - Moorgate Lane	High	60	358924.0	400285.2
R3	Residential - Moorgate Road North	High	40	358870.6	400221.5
R4	Residential - Shaldon Grove	High	45	358793.5	400127.4
R5	Residential - Shaldon Close	High	45	358721.3	400044.0
R6	Residential - Shaldon Close	High	40	358583.3	399971.9

4.2.3 It should be noted that existing warehouses to the north, east and south of the proposals do not represent sensitive land uses. As such, they have not been considered further within this assessment.

4.2.4 A study was undertaken to identify any designations in the vicinity of the proposed development. This was completed using the Multi-Agency Geographic Information for

the Countryside (MAGIC) web-based interactive mapping service⁶, which draws together information on key environmental schemes and designations. The review did not indicate any of the following in close proximity to the development:

- Country parks;
- Areas of outstanding natural beauty;
- Environmentally sensitive areas;
- National nature reserves;
- National parks;
- Special Areas of Conservation;
- Special Protection Areas;
- Sites of Special Scientific Interest;
- Biosphere reserves;
- Scheduled Monuments; and,
- World Heritage Sites.

4.2.5 The Acornfield Plantation Local Nature Reserve (LNR) is located approximately 1.1km north-east of the proposed development. Given the distance between the proposals and the LNR and the level of lighting provided at the existing industrial estate, it is not anticipated that the development will not significantly impact ambient lighting levels at the designation. As such, it was not considered further in the context of the assessment.

4.3 Existing Lighting

4.3.1 The baseline review indicated existing street lighting along Moorgate Road North to the west of the site, as well as floodlighting and security lighting throughout the existing industrial estate.

4.4 Environmental Zone

4.4.1 Based on the criteria displayed in Table 1 and the results of the desktop study, the assessment extents were defined as Environmental Zone E3. This was because the site is

⁶ <http://magic.defra.gov.uk/MagicMap.aspx>.

situated in a suburban setting with a medium level of existing lighting. As such, the criteria for Environmental Zone E3 stated in Table 1 were used throughout the assessment.

5.0 **ASSESSMENT**

5.1.1 The proposed development may include the following lighting fixtures:

- Area lighting, including that for car parks; and,
- Pedestrian lighting.

5.1.2 The results of the baseline assessment indicated that the site is located in Environmental Zone E3. As such, a level of night-time lighting would be expected due to the suburban setting of the proposed location.

5.1.3 Lighting in itself is not a problem; it only becomes a problem where it is excessive, poorly designed, badly installed or poorly maintained. The exact level of light trespass and source intensity experienced at sensitive receptor locations within the vicinity of the site will depend on the unit orientations and luminaires installed as part of the proposals. Information on the lighting design for the scheme was not available at the time of the assessment. As such, light trespass and source intensity values could not be predicted for comparison with the relevant criteria. A qualitative assessment has therefore been undertaken and further work suggested for inclusion as a planning condition, if deemed necessary by KMBC.

5.1.4 The proposed development comprises replacement of an outdated industrial unit with a new warehouse and storage building. Both structures are likely to require a similar amount of lighting. As such, it is considered unlikely that replacing the previous building with a similar scheme will lead to a noticeable increase in light spill. Additionally, the introduction of new external luminaires at the development provides an opportunity to utilise more efficient lighting, directed downwards to further minimise impacts on nearby sensitive receptors. Following consideration of these factors, impacts associated with the development are not predicted to be significant.

5.1.5 Should KMBC require further reassurance in regards potential impacts, then a planning condition could be attached to the consent to provide further confidence that light levels will not be an issue at the site. This could require a detailed model of existing and proposed lighting to be produced to ensure light trespass and source intensity values are below the relevant criteria for Environmental Zone E3 at sensitive receptor locations within the vicinity of the development. Potential condition wording is provided in Section 6.0.

6.0 **MITIGATION**

6.1.1 In order to mitigate potential impacts, the lighting design strategy should ensure that the criteria for Environmental Zone E3 is achieved at all sensitive locations in the vicinity of the site. The relevant values are summarised in Table 4.

Table 4 Proposed Control Criteria

Environmental Zone	Sky Glow ULR (%)	Light Trespass (into Windows) E_v (lux)		Source Intensity I (kcd)		Building Luminance Pre-curfew Average L (cd/m^2)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	
E3	5.0	10	2	10,000	1,000	10

6.1.2 There are a number of mitigation controls which can be included within the final scheme design to ensure the criteria in Table 4 are achieved. These include:

- The inclusion of landscaping or vegetation should be considered if necessary to provide screening against light spillage. This would be relevant along the western boundary in order to minimise impacts on receptors along Moorgate Road North;
- Scheme lighting is to be directed downwards to illuminate its target. There is no requirement for building or up lighting for a development such as that proposed;
- Lighting should be designed to the correct standard for the task and should not over light;
- Lighting should be directed to minimise and preferably avoid light spillage onto neighbouring properties;
- The lights used should be the most efficient, taking into account cost, energy use, colour rendering and the purpose of the lighting scheme required; and,
- The lighting scheme should meet all relevant British Standards.

6.1.3 Based on the assessment results, the following condition has been produced. This could be attached to the planning consent for the development to provide KMBC with further reassurance of predicted impacts:

"Prior to the installation of any lighting to serve the development hereby approved, a report detailing the lighting scheme and predicted light levels at all

sensitive receptor locations will be submitted to and approved in writing by the Local Planning Authority.

Predicted lighting levels must conform to the requirements of the Obtrusive Light Limitations for Exterior Lighting Installations for Environmental Zone - E3, contained within Table 2 of the Guidance Notes for the Reduction of Obtrusive Light, GN01, The Institution of Lighting Practitioners, dated 2020.

Reason: In order to ensure a suitable level of amenity for existing sensitive receptors in the vicinity of the proposals."

7.0 CONCLUSION

- 7.1.1 Redmore Environmental Ltd was commissioned by EEIP II Arundel Propco 2 Holdings Limited to undertake a Lighting Assessment in support of a commercial development on land at Deacon Business Park, Moorgate Road North, Knowsley.
- 7.1.2 Artificial lighting associated with the development has the potential to cause impacts at existing sensitive receptors in the vicinity of the site. As such, a Lighting Assessment was undertaken to consider the likely effects.
- 7.1.3 A baseline study was undertaken to determine existing conditions in the vicinity of the site. The results were utilised to classify the surrounding area as Environmental Zone E3 - suburban.
- 7.1.4 The exact level of light trespass and source intensity experienced at sensitive receptor locations within the vicinity of the site will depend on the unit orientations and luminaires installed as part of the proposals. A detailed lighting design for the scheme was not available at the time of reporting. As such, light trespass and source intensity values could not be predicted for comparison with the relevant criteria. A qualitative assessment was therefore undertaken and further work suggested for inclusion as a planning condition, if deemed necessary by KMBC.
- 7.1.5 The assessment indicated that the proposals are unlikely to expose nearby sensitive receptors to unacceptable lighting levels. This was due to the nature of the development, as well as potential control techniques that can be included in the final layout. As such, impacts associated with lighting of the scheme are not predicted to be significant.
- 7.1.6 A number of mitigation options were identified for consideration during detailed design. A suitable planning condition was also produced to provide further reassurance to KMBC that impacts associated with the development will not be significant.

8.0 **ABBREVIATIONS**

CIBSE	Chartered Institute of Building Services Engineers
CIE	International Commission on Illumination
ILP	Institute of Lighting Practitioners
KMBC	Knowsley Metropolitan Borough Council
MAGIC	Multi-Agency Geographic Information for the Countryside
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
ULR	Upward Light Ratio

Figures

