



Addendum Report
Land at Hornton Grounds Quarry
Updated Lighting Impact Assessment

Project Reference: HGQ0001

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1. Introduction

1.1 Background

Griffin Ecology Ltd. have been commissioned by the client to undertake an updated impact assessment in respect of bats following the information provided by the Lighting Impact Assessment relating to the application for a small administration building and plant associated with the storage of diesel oil and the filling of distribution tankers at Hornton Grounds Quarry.

This report is provided as an addendum to the Preliminary Ecological Appraisal Report compiled by Griffin Ecology Ltd. and dated 10th June 2020.

1.2 Aim and Purpose

This report aims to provide consideration of the potential ecological impacts to bats resulting from the proposed lighting strategy at Hornton Grounds Quarry and set out measures to minimize potential adverse impacts in consideration of the mitigation hierarchy with avoidance of impacts prioritised where possible.

2. Methodology

2.1 Impact Assessment

The CIEEM EclA guidelines (CIEEM, 2018) define a significant effect in the context of an Ecological Impact Assessment as *'an effect that either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general'*. A significant effect is therefore an effect that is *'sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of a project'*. Such a significant effect is determined by assessing any deviation in the baseline conditions of a feature of ecological importance that may occur as a result of individual and cumulative impacts during the construction and/or operational phases of the proposals.

The BCT guidance note 08/18, Bats and Artificial Lighting in the UK (BCT, 2018) suggests that the addition of artificial lighting to key areas within the Core Sustainance Zones of a bat roost or along existing migratory routes may increase the chances of predation, and therefore force bats to modify their behaviour in response to this threat. In determining the likely potential impacts of operational lighting on bats, consideration has been given to their likely presence on site and within habitats to be subject to artificial light spill.

An assessment has been carried out in consideration of Table 4.1 of the Bat Survey Guidelines (BCT, 2016) which attributes potential suitability for roosting, commuting and foraging bats based on features present on site and within the surrounding landscape applied with professional judgement.

3. Results

3.1 Baseline Conditions

The site sits within open countryside some 7.8km to the north-west of the Town of Banbury in Oxfordshire. Accessed off Stratford Road, the site forms part of the wider Hornton Ground Quarry and stone cutting yard.

The site is dominated by ephemeral vegetation, patchy in nature, with frequent areas of exposed bare earth. This habitat has likely established on site as a result of its historic and ongoing function. This habitat offers limited structure or sheltering opportunities with frequent patches of exposed bare earth and as such generally considered to offer low ecological value both within the site and local context. This habitat, particularly where paired with the hedgerows, waterbodies and tall rural around its fringes, will likely offer some opportunities for common and widespread invertebrates. Should densities of invertebrates be present in these area, as is thought likely, opportunities will be present for foraging bats, although these foraging opportunities will be limited by the size and extent of the suitable habitat present.

The site is currently unlit with no existing sources of artificial light present, however the adjacent quarry yard has security lighting and these sources of light do spill onto the site. The Lighting Impact Assessment provided by RSK (RSK, August 2020) indicates the minimum recorded light levels across the whole site at 0.15 Lux. The maximum reading of 4.50 Lux was taken by the existing security building near the quarry site office.

The data search undertaken by TVERC reveals records of common pipistrelle (*Pipistrellus pipistrellus*) and noctule bats (*Nyctalus noctula*) foraging within the 1km search radius of the site. The assessment of habitats on site revealed no suitable structures or features, offering bat roosting opportunities to be present.

Commuting bats are generally associated with connective vegetative corridors, allowing sheltered passage through the landscape and between roosting and foraging habitat further afield. Such opportunities only exist along the southern boundary. Species such as, noctule, are known to exploit open areas where invertebrates may gather as a forage resource and it is possible that the habitat on site may offer such opportunities, however, these would be limited by the size and extent of the habitat present.

When considering the habitats on site in line with the Bat Conservation Trust's "Bat Surveys for Professional Ecologists, Good Practice Guidelines" and Table 4.1 which attributes suitability for bat roosting and foraging based on features offered and habitat present within the locality, the site is afforded **negligible** suitability as a resource to roosting bats and **low** suitability for use by commuting and foraging bats.

3.2 Potential Impacts

The Lighting Impact Assessment provides predicted light spill resulting from the development at a total of 16 measuring points across the site. This predicted light spill is most increased where the site abuts the existing access road and is influenced by the existing security lighting. With the remainder of the site receiving only a relatively small increase in predicted light of 0.83 Lux. Predicted measurements along the northern, southern and western boundaries is considered to be negligible.

In review of the Lighting Impact Assessment, the proposed lighting, relating to the development, will have a negligible impact on areas surrounding the site as a result of the directional cowling directing light away from boundary features and neighbouring habitats and towards the ground in an effort to reduce back spill.

Lighting design included:

- Lighting throughout the site has been designed to minimise horizontal spill of light to the site border.
- Lighting is directed away from site border.
- Backing plates have been incorporated on the lighting columns.
- Lighting is fixed at a height of 5m below the height of the bunds and new planting surrounding the site.
- Lighting has been designed in accordance with ILP Guidance Notes for Reduction of Obtrusive Light and CIE 126 (1997) Guidelines for Minimising Sky Glow. Lighting throughout the site has been designed to minimise horizontal spill of light to the site border.

The lighting type suggested within the proposals is LED type. Such lighting is more directional and can be better controlled and is available in a number of colour temperatures. Research has shown that “warm white” at around 3000°K and as low as 2700°K can now be used with little reduction in lumen output. LED light typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impacts on bats (Stone, 2012,2015a, 2015b).

The PEA report recommends the provision of a 2m buffer to the internal edge of the hedgerows and waterbody on site in an effort to retain and protect these habitats and secure continued connectivity for species such as grass snake and terrestrial mammals which would likely commute across the site.

The addition of scrub planting is suggested to the eastern and western edges of the waterbody in an effort to enhance the existing mosaic of habitats present on site offering enhanced opportunities for herpetofauna, invertebrates and terrestrial mammals. In consideration of the position of security lighting some 3-4m to the north of this waterbody it is suggested that the provision of scrub planting is continued along the northern edge of the waterbody to further screen this boundary feature from any residual light spill not contained by the backing plate.

4. Recommendations

The habitats on site offer negligible suitability for use by roosting bats and low suitability for use by foraging and commuting bats as such the use of the site for occasional foraging and commuting by bats cannot be eliminated. As such the following recommendation have been made to ensure that most valuable ecological features on site are appropriately buffer and protected from the potential impacts of the additional of artificial lighting as part of the proposals.

- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally in the range of 2700 to 3000° Kelvin) should be adopted to reduce the blue light component.
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).

- The provision of scrub planting to the eastern and western edges of the waterbody should be extended to run the full length of the northern edge. This will seek to further mitigate for any residual light spill created by security light within the development footprint.

The recommendations and suggested enhancements set out within the PEA (Griffin Ecology, 2020) remain relevant.

Should evidence of protected species be discovered during works, works should temporarily stop while Griffin Ecology Ltd. or the local office of Natural England are contacted for advice on the best way to proceed.

5. References

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