ECOLOGICAL EXPERTISE, EVOLVED

Loddon Garden Village

Technical Appendix 11.17: Information for Habitats Regulations Assessment

Prepared on behalf of

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Final Report

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Loddon Garden Village

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Loddon Garden Village

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1. INTRODUCTION

Background

1.1 Ecological Planning & Research Ltd (EPR) was commissioned by the University of Reading (UoR) to provide advice in relation to the need to ensure that the Loddon Garden Village proposals, are able to comply with the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended)(the 'Habitats Regulations') in respect of the protection that they afford to Internationally designated sites for nature conservation.

1.2 The Loddon Garden Village (LGV) development is located approximately 4.3km from the Thames Basin Heaths (TBH) Special Protection Area (SPA) International site at its nearest point (see **Map 11.17.1**).

1.3 Consequently, it will be necessary for Wokingham Borough Council (WBC), as the Competent Authority under the Habitats Regulations to carry out an HRA of the Proposed Development to determine whether it is likely to have a significant effect on the SPA, either alone or in combination with other plans and projects, and if so carry out an Appropriate Assessment (AA) to determine whether there will be an adverse effect on the integrity of the SPA.

1.4 The purpose of this Information for Habitats Regulations Assessment (IfHRA) report is to provide WBC with the information that they will require in order to carry out an HRA, and if necessary an AA, and these processes are described in more detail below.

Relevant Legislation, Policy, Guidance and Case Law

1.5 To improve document flow, information relating to relevant legislation, policy, guidance and case law is included at **Annex 1**.

Preceding Plan-Level Habitats Regulations Assessment

1.6 A Habitats Regulations Assessment (HRA) (AECOM, 2025) was undertaken of the Wokingham Local Plan Update (WBC, 2024), as is required under the Environmental Assessment of Plans and Programmes Regulations 2004 and the Habitat Regulations.

1.7 The HRA identified increases in recreational pressure, atmospheric pollution and loss of functionally linked land as potential impact pathways which may result in adverse effects on the TBH SPA and the features for which it is designated as result of development allocated within the Local Plan Update, which includes the proposed Loddon Garden Village at Policy SS13.

1.8 The loss of functionally linked land was, however, screened out at the AA stage as no allocated sites within the Local Plan Update were found to have suitable offsite supporting habitat for the qualifying SPA species.

1.9 Regarding recreational pressure, following AA the HRA concluded that the Wokingham Local Plan Update "*provides an adequate policy framework to protect the Thames Basin Heaths SPA from an increase in recreation pressure that will occur due to residential growth in the borough."*. The requirements for the provision of Suitable Alternative Natural Greenspace (SANG) and Strategic Access Management and Monitoring (SAMM) contributions from new residential development was assessed as being sufficient to prevent adverse effects on the integrity of the TBH SPA arising as a result of proposed development included within the Local Plan Update, considered both alone and in combination with other plans and projects.

1.10 As part of the Local Plan Update HRA, detailed air quality modelling was undertaken across the TBH SPA. It was ultimately determined that changes in levels of NO_x, ammonia and nitrogen deposition would not have an adverse effect on the integrity of the TBH SPA, arising as a result of proposed development included within the Local Plan Update alone or in-combination.

Conceptual Impact Assessment Model

1.11 In carrying out an assessment of the potential effects of a development proposal on an International Site, the 'source-pathway-receptor' concept provides a useful model for framing and objectively evaluating the mechanisms through which potential effects may occur and has been employed in this assessment. **Table 1.1** below sets out the various parts of the model and how they relate to each other.

Table 1.1: Conceptual Impact Assessment Model

Source	Pathway	Receptor
Elements of the development proposals that are likely to generate or contribute towards certain environmental effects.	Changes in environmental conditions caused by aspects of the development proposals that have the potential to affect an identified impact receptor.	The interest features / conservation objectives of the International Site concerned, and the environmental conditions required to support it.

1.12 During the assessment process, information has been gathered relating to each part of the conceptual assessment model in respect of each potential impact upon nearby International Sites. The consideration of this information will then allow WBC as the Competent Authority to determine whether or not a potentially viable impact pathway exists between the development proposals and International Sites within the Zone of Influence (ZoI) of the proposals.

Scope of the Habitats Regulations Assessment Report

1.13 In view of the above considerations, the scope of this IfHRA report is as follows:

- To gather information to establish whether or not the Proposed Development at LGV is likely to contribute to a significant effect on any International Sites located within the ZoI, either alone or in combination with other plans and projects;
- To gather information to establish, if a significant impact is likely, whether or not it would adversely affect the integrity of any International Sites;
- To recommend impact avoidance and mitigation measures, if required, to address any potential impacts identified; and

- To make recommendations in relation to the requirements of the Conservation of Habitats and Species Regulations 2017 (as amended) in view of the information collected, if possible.

Consultation

1.14 As the statutory nature conservation advisor under the Habitats Regulations, consultation was undertaken with Natural England in early 2025. A Site visit was undertaken on 10th March 2025, following which a response was provided by Natural England (**Annex 2**). Following this feedback, amendments were made to the design of the SANGs and a subsequent virtual meeting was held on the 29th April 2025. During this meeting the updated designs were presented to Natural England. Further correspondence from Natural England was issued, confirming the acceptability of the Western SANG and advising on amendments required to the Eastern SANG which have been taken into account within this SANG Delivery Plan (**Annex 3**).

2. CHARACTERISATION OF THE PROPOSED DEVELOPMENT

Introduction

2.1 Guidance from the European Commission indicates that the first stage of providing the information that is necessary for a Competent Authority to undertake the HRA process is for all those aspects of the subject project or plan, which either alone or in combination with other plans and projects have the potential for having a significant effect on an International Site, to be identified and characterised.

2.2 Undertaking such a systematic characterisation in respect of the Proposed Development will enable the various aspects of the project to then be related to the particular sensitivities of the International Sites, so that the potential ways in which the former may affect the latter can be examined.

Site Location and Context

2.3 LGV (the 'Site'), located entirely within Wokingham Borough, is proposed for allocation under Policy SS13 of the Local Plan Update (WBC, 2024). The Site is located on the southern outskirts of Reading, bound by the M4 motorway to the north, and the A327 to the south.

2.4 The Site, covering approximately 399ha, is largely made up of agricultural land, including arable and pasture grasslands. Pockets of woodland are dispersed throughout the Site, with wetland habitats present along the River Loddon which bisects through Site north to south.

Proposed Development

2.5 The description of development for the application is as follows:

"Application for the phased development of a new community at Loddon Garden Village, comprising, in outline:

- *up to 2,800 residential units to include up to 100 custom and self-build plots;*
- *2 primary schools (up to 3 forms of entry) to include early years provision and 1 secondary school (up to 12 forms of entry);*
- *one District Centre, to incorporate up to 11,000m2 of Class E (Commercial, business and Service, to include a food store of around 2,500m2), and Class F (Local Community and Learning);*
- *one Local Centre; to incorporate up to 2,400m2 of Class E;*
- *a Sports Hub to include sports pitches and pavilion space;*
- *up to 4,250m2 of further Class E, Class F, and sui generis development to include commercial, health care and public house;*
- *comprehensive green infrastructure including a Country Park, landscaping and public open space, and ecological enhancement measures;*
- *20 gypsy and traveller pitches;*

- *comprehensive drainage and flood alleviation measures to include Sustainable Urban Drainage Systems (SUDS) and engineering measures within Loddon Valley for the River Loddon;*
- *internal road network including spine road with pedestrian and cycle connections and associated supporting infrastructure;*
- *new and modified public rights of way;*
- *associated utilities, infrastructure, and engineering works, including the undergrounding of overhead lines;*
- *Ground reprofiling to accommodate infrastructure, flood alleviation and development parcels;*
- *Up to 0.5ha of land adjoining St Bartholomew's church for use as cemetery;*
- *Electricity substation (up to 1.5ha).*

All matters reserved other than access, incorporating:

- *a new pedestrian, cycle and vehicular access to Lower Earley Way via a new 4th arm to the Meldreth Way roundabout;*
- *a new pedestrian, cycle and vehicular bridge over the M4;*
- *a new pedestrian, cycle and vehicular bridge over the River Loddon;*
- *a new vehicular access to the A327 Reading Road, via a new arm to the Observer Way roundabout;*
- *a new pedestrian, cycle and vehicular access to Thames Valley Science Park;*
- *an initial phase of internal roads with associated drainage, landscape and engineering works and ground reprofiling, between the A327 and the south eastern boundary of the site.*

Application includes full permission for the change of use of 40.4 hectares of agricultural land to Suitable Alternative Natural Greenspace (SANG), 18.35 hectares of SANG link, and provision of Biodiversity Net Gain measures, the demolition and clearance of 20,809 m2 of buildings and structures at the Centre for Dairy Research (CEDAR) and at Hall Farm, the demolition of 3 existing dwellings on Carter's Hill Lane, and the retention of specified buildings at Hall Farm."

Physical Changes and Zone of Influence

2.6 The activities associated with the Proposed Development which are likely to lead to biophysical changes – and could accordingly give rise to ecological effects on sensitive designated site features in the absence of mitigation – are set out in **Table 2.1** below, which is drawn from Box 9 of the EcIA Guidelines (CIEEM, 2018).

2.7 The ZoI of a proposed development is defined by the EcIA Guidelines as:

> *"… the area over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities"*.

2.8 In this case, the ZoI of the Proposed Development will encompass different areas, and thus potentially impact upon different ecological receptors, depending upon the spatial extent of the relevant biophysical change (e.g. light, noise, habitat loss, recreational disturbance). The ZoI(s) relevant to this assessment are summarised in **Table 2.1** below.

Table 2.1: Activities, potential impacts, and associated ZoIs

Activity	Potential Impact	Zone of Influence
Site Clearance and Construction Phase		
Access and travel on / off site	Noise / visual / lighting disturbance of vulnerable species	Site and immediately adjacent land
Assembly and storage areas for machines and materials; construction compounds	Loss and fragmentation of habitats Noise / visual / lighting disturbance to vulnerable species	Site and immediately adjacent land
Vegetation clearance, ground, excavation and structural works, demolition and alteration operations	Loss and fragmentation of habitats Damage to vulnerable habitats Direct harm to vulnerable species Noise / visual /vibration/ lighting disturbance to vulnerable species Change to surface and ground water flows Dust generation	Site and immediately adjacent land
Lighting of work area	Disturbance to vulnerable species	Site and immediately adjacent land
Drainage	Change of groundwater flows Change of water quality in groundwater Change in habitats fed by groundwater flows	Site and functionally linked watercourses
Operational Phase		
Access and travel on / off site	Noise / visual / lighting disturbance to vulnerable species Changes in air quality	Site and immediately adjacent land Within 200m of affected roads*
Occupation of new houses: urban effects	Noise / visual / lighting disturbance to vulnerable species Loss and fragmentation of habitats by trampling Increased risk of cat predation Degradation and pollution of vulnerable habitats through urban effects (such as fly tipping, introduction of non-native species, arson)	Approximately 400m radius from new development
Recreation	Fragmentation of habitats by trampling Noise / visual disturbance to vulnerable species by members of the public and/or dogs	Up to 7km radius

**Roads subject to an increase of more than 1,000 Average Annual Daily Trips (AADT) or 200 Heavy Duty Vehicles (HDV)*

3. CHARACTERISATION OF INTERNATIONAL SITES

Introduction

3.1 This section of the IfHRA report describes and characterises International Sites within the potential ZoI of the Proposed Development, including their qualifying features and conservation objectives, in order to enable an assessment to be made of the potential for significant impacts arising in the absence of impact avoidance and mitigation measures.

International Sites Considered to be Within the Potential Zone of Influence of the Proposed Development

3.2 **Map 11.17.1** shows the location of the TBH SPA is relation to the Site. There are no other International Sites within a 7 km radius.

3.3 The citation, data sheet and a summary of the conservation objectives for the TBH SPA are included in **Annex 4** and summarised below.

Thames Basin Heaths SPA

3.4 The TBH SPA receives its designation due to the breeding populations of heathland birds it supports which are listed on Annex I of the Birds Directive. These species nest either on or close to the ground and consequently, are vulnerable to increases in recreational pressure and public access impacts arising as a result of new housing. Their supporting habitat, which includes lowland heathland and rotationally managed conifer plantation is sensitive to changes in air quality.

3.5 The SPA covers 8274.72ha and is legally underpinned by 13 Sites of Special Scientific Interest (SSSI). The closest of these SSSI's is Bramshill SSSI, which is largely in a 'Favourable' condition (99.94%), with the remaining area 'Unfavourable, no change' (0.06%).

Qualifying Features

3.6 The TBH SPA qualifies for its designation by supporting population of European Importance of the following species listed on Annex I of the Birds Directive:

- A224 Nightjar *Caprimulgus europaeus* – 7.8% of GB population;
- A246 Woodlark *Lullula arborea* – 9.9% of GB population; and
- A302 Dartford Warbler *Slyvia undata* – 27.8% of GB population.

Conservation Objectives

3.7 The Natural England conservation objectives for the TBH SPA are as follows:

> *"Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:*
>
> - *The extent and distribution of the habitats of the qualifying features;*
> - *The structure and function of the habitats of the qualifying features;*

- *The supporting processes on which the habitats of the qualifying features rely;*
- *The population of each of the qualifying features; and*
- *The distribution of the qualifying features within the site."*

Natural England Supplementary Advice

3.8 Natural England has also published 'Supplementary Advice on Conserving and Restoring Site Features'. Natural England's supplementary advice includes site-specific targets intended to support the achievement of the conservation objectives, and these have been considered throughout this assessment.

3.9 The relevant publication dates for the Supplementary Advice for the TBH SPA is listed in **Table 3.1** below along with a summary of the site-specific targets of most relevance to the HRA of the Proposed Development.

Table 3.1: Summary of Natural England Supplementary Advice for SAC and SPA sites within the ZoI

Site Name	Publication Date	Site-specific Targets	Feature(s) Target Applies to
Thames Basin Heaths SPA	9 May 2016	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain or restore the structure, function and/or the supporting processes associated with qualifying features and its supporting habitats.	Nightjar Woodlark Dartford Warbler
		Maintain or restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on APIS	Nightjar Woodlark Dartford Warbler
		Maintain the size of the breeding nightjar population whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.	Nightjar Woodlark Dartford Warbler
		Maintain the extent, distribution and availability of suitable breeding habitat which supports qualifying features for all necessary stages of its breeding cycle (courtship, nesting, feeding and roosting).	Nightjar Woodlark Dartford Warbler
		Restrict and reduce the frequency, duration and/or intensity of disturbance affecting nesting, roosting and/or foraging birds so that the qualifying feature is not significantly disturbed	Nightjar Woodlark Dartford Warbler
		Maintain or restore the distribution, abundance and availability of key	Nightjar

Site Name	Publication Date	Site-specific Targets	Feature(s) Target Applies to
		prey items at prey sizes preferred by qualifying features.	Woodlark Dartford Warbler

Site Improvement Plans

3.10 Site Improvement Plans (SIPs) produced by Natural England set out measures to address prioritised issues affecting site condition. The SIP for the TBH SPA (NE, 2014) sets out measures to addresses the following prioritised issues:

- Public access/disturbance;
- Under grazing;
- Forestry and woodland management;
- Hydrological changes;
- Inappropriate scrub control;
- Invasive species;
- Wildfire/arson;
- Air pollution;
- Feature location/extent/condition unknown;
- Military activity ; and
- Habitat fragmentation.

Bird Populations

3.11 Monitoring surveys of the qualifying features of the TBH SPA are undertaken annually, with the results published by the Thames Basin Heaths Partnership (TBH Partnership, 2024).

3.12 The 2024 survey results showed increases in the number of pairs of all three species since the previous year. Nightjar saw an increase of 4%, Dartford Warbler increased by 35% and Woodlark numbers rose by 30%.

3.13 Numbers of all three species have fluctuated over recent years, which can likely be attributed to environmental conditions and habitat management of the Site (TBH Partnership, 2024). However, since 2021 despite some yearly fluctuations overall numbers have remained relatively stable, with minor increases for all three species since that time.

3.14 Long-term, numbers have continued to rise demonstrating the importance of the protection offered by the TBH SPA and the associated impact avoidance and mitigation strategies implemented across the region. In a little over 25 years, the number of Nightjar have increased by 60%, Dartford Warbler by 32% and Woodlark by 47%.

4. ASSESSMENT OF POTENTIAL IMPACT PATHWAYS

Introduction

4.1 The Source-Pathway-Receptor model described in **Section 1** has been used to consider whether the International Site qualifying features listed in **Section 3** might be adversely affected by the biophysical changes predicted to arise as a result of the Proposed Development in **Section 2** in the absence of impact avoidance and mitigation measures. Relevant impact pathways scoped in for further assessment are then considered in greater detail in the proceeding sections.

4.2 The source of potential effects in each case derives from the construction and operation of the Proposed Development, and the receptor is the qualifying features of the International Sites.

Potential Impact Pathways and Vulnerability of Receptors

4.3 **Table 4.1** below summarises the vulnerability of designated site receptors listed in **Section 3** to a number of potential impact pathways, and records whether each designated site is considered to fall within the predicted ZoI for each impact type generated by the Proposed Development (as described in **Section 2**). The relevant sections of this report where further assessment is set out are also listed.

Table 4.1: Scoping of potential impact pathways

Impact Pathway	Vulnerability	Scoped In/Out	Report Section
Loss and/or fragmentation of habitats	The birds associated with the TBH SPA are ground nesting heathland specialists, who rely upon particular habitat types (including heathlands and rotational conifer) for breeding and/or foraging. Species such as Nightjar are wide ranging, including habitats away from the heathlands, which may include woodland edges, grasslands and farmlands. The loss of supporting habitats around the TBH may reduce foraging opportunities and lower the number of territories the heaths are able to support.	Scoped Out – The Site does not contain habitats which may support the SPA birds. Furthermore, the Proposed Development lies more than 4km from the TBH SPA which extends beyond the typical range of these species (up to 5.6km for Nightjar (Evens *et al*, 2017)).	N/A
Light pollution	Increases in light levels can impact upon bird behaviour, including increased levels of activity at unnatural hours of the day (e.g. singing overnight), and changes in foraging behaviour to avoid artificially lit areas. This is particularly prevalent for crepuscular species such as Nightjar. Such impacts may reduce species fitness, increase predation risk and reduce breeding success.	Scoped Out – The Proposed Development lies more than 4km from the TBH SPA, and therefore changes to lighting levels will not impact the SPA or its qualifying features.	N/A
Noise	Increases in noise levels may impact upon bird behaviour and distribution, notably through disturbance to breeding behaviour (i.e. impacts upon singing males and territory distribution) and avoidance of foraging habitats. Such impacts may reduce species fitness and reduce breeding success.	Scoped Out – The Proposed Development lies more than 4km from the TBH SPA, and therefore changes to noise levels will not impact the SPA or its qualifying features.	N/A
Hydrological change	Heathland and woodland habitats are sensitive to the effect of changes in surface water and groundwater quality from pollution, and changed in water quality which may affect the water table and water levels essential for supporting heathland and woodland habitats and communities.	Scoped Out - The Proposed Development lies more than 4km from, and is not hydrologically connected to the TBH SPA. Changes in local hydrology would therefore not impact the SPA or its qualifying features.	N/A
Recreational pressure	Birds can be sensitive to increased recreational use of nearby accessible land since this may disturb feeding and breeding behaviour, potentially leading to adverse effects. Increased recreational pressure also has the potential to result in effects on habitats from trampling, fragmentation and increased risk of wildfire.	**Scoped In**	**5**

Impact Pathway	Vulnerability	Scoped In/Out	Report Section
Cat predation	Ground nesting birds may be particularly vulnerable to predation, and the introduction of domestic pets would increase this risk, with the potential to negatively impact the bird population within close proximity to new residential development.	Scoped Out - It is generally accepted that the average roaming distance of domestic cats is approximately 400m. With the Proposed Development located more than 4km away at its closest point an increase in pet presence will not impact the SPA or its qualifying features.	N/A
Changes in air quality	Many terrestrial habitats are sensitive to changes in air quality, including increases in atmospheric concentrations of nitrogen dioxide and ammonia associated with traffic and leading to localised effects, and nutrient deposition and acidification which may lead to changes in habitat composition and condition in the long term. These changes may result in a loss or degradation of supporting habitats for the SPA qualifying species.	**Scoped In**	**6**

5. RECREATIONAL PRESSURE

Introduction

5.1 This section considers the potential effects of increased recreational pressure generated during the operational phase of the Proposed Development on the TBH SPA, in view of the above-described sensitivities of the SPA and its qualifying features, and available information about the current and potential future levels of recreational pressure that could occur as a result of the proposals either alone or in combination with other plans and projects.

5.2 Where the potential for likely significant effects is identified, the scope of any specific impact avoidance and mitigation measures is also considered as part of an AA.

Relevant Background Information

Thames Basin Heaths Delivery Framework

5.3 The Joint Strategic Partnership Board was formed by local authorities affected by the TBH SPA, alongside other stakeholders, to provide overarching guidance on suitable impact avoidance and mitigation measures for the TBH SPA to allow for development within the Zone of Influence (TBH Joint Strategic Partnership Board, 2009).

5.4 The endorsed Delivery Framework represents the most recent and comprehensive strategic level guidance document relating to the TBH SPA and forms the basis for local mitigation strategies.

5.5 The key provisions of the Delivery Framework that are relevant to the HRA are be summarised below:

- Residential development between 400m-5km linear distance of the SPA should provide SANG at a rate of at least 8ha per 1,000 new residents;
- Large scale development (over 50 units) beyond 5km should be assessed on an individual basis;
- The number of new residents being introduced by a particular development should be calculated using an average household occupancy rate of 2.4 people per household unless robust local evidence demonstrates otherwise;
- SANG design should have regard to Natural England's SANG Quality Guidelines and be provided in perpetuity;
- Contributions to strategically coordinated access management should be provided; and
- That the provisions of the Delivery Framework apply to proposal or 1 or more net new dwellings in Use Class C3 (residential development) and proposals for 1 or more net new units of staff residential accommodation falling within Use Class C1 and C2 (residential institutions).

5.6 The coordinated and strategic approach to access management and monitoring advocated by the Framework is fulfilled in the form of the SAMM Project, delivered by Natural England's Thames Basin Heaths Partnership. Developer contributions are collected by local authorities

and passed onto Natural England to deliver strategic measures on the SPA, including wardening, public engagement and monitoring surveys.

Natural England's Guidelines for Creation of Suitable Alternative Natural Greenspace

5.7 Natural England has produced a set of evidence-based guidelines to assist in the creation of functional SANG to provide an attractive recreational alternative to the SPA. The guidelines provide a checklist of 'must have', 'should have' and 'desirable' features to be included within the SANGs (Natural England, 2021).

Assessment Methodology

5.8 Existing information regarding the patterns of access to the TBH SPA and its associated SANGs commissioned by the Thames Basin Heaths Partnership were assessed as part of the desktop study.

Assessment of Likely Significant Effects

Baseline Recreational Pressure (Operational Phase only)

5.9 As part of the SAMM Project, visitor surveys have been undertaken across the Thames Basin Heaths over more than 10 years to monitor visitor access patterns and identify trends in visitor numbers. The most recent survey was undertaken in 2023 by Footprint Ecology (Panter *et al,* 2024).

5.10 The findings of the 2023 surveys demonstrated that the visitor profile remained largely consistent with the findings of previous years. The majority of visitors to the TBH SPA comprised of dog walkers (74%), who live within 5km of the SPA (92%) and visit at least weekly (68%). This suggests that mitigation measures previously designed to target these groups are still suitable.

5.11 The number of visitors to the TBH SPA appears to have increased in comparison to both 2018 and 2012/13 (other visitor survey years). The number of people entering per hour increased by 16% compared to 2018, and 8% compared to 2012/13 (Panter *et al*, 2024). This is in contrast to 2018, where site wide reductions in visitor numbers were recorded compared to 2012/13 (Southgate *et al*, 2018).

5.12 During the 2023 visitor surveys of the TBH SPA, a total of 7,208 people were recorded accessing 30 access points (Panter *et al*, 2024). Of these 212 were recorded at Survey Point 8 (North entrance to Warren Heath), which lies within Bramshill SSSI, and is the closest survey point to the Proposed Development. This is the equivalent to 3% of all visitors recorded during the duration of the visitor surveys. This number, however, includes counts of people both entering and exiting the Survey Point and therefore may represent an overestimation of true visitor numbers.

5.13 The majority of the visitors to the TBH SPA visit locally, with 92% originating within 5km of the SPA boundary. Visitors at Survey Point 8 (North entrance to Warren Heath), however, travel a larger distance to reach the SPA, with 75% of all visitors travelling from within 8.8km, representing the second largest catchment of the 30 Survey Points.

5.14 Of the 1,092 postcodes provided as part of the survey, 44 originated from within Wokingham Borough, equivalent to 4% of visitors recorded on the TBH SPA visitor survey.

Potential Change in the Pattern of Baseline Recreational Pressure

5.15 The Proposed Development would result in the creation of up to 2,800 new residential dwellings. Assuming an average household size of 2.4 people per home (2021 census), the Proposed Development would result in an additional 7,032 residents.

5.16 In the United Kingdom, it is estimated that 36% of households own at least one dog (UK Pet Food, 2024), and therefore 1,055 of the new dwellings would be expected to be dog-owning. The 2023 visitor survey found that dog owning groups were accompanied by 0.92 dogs per group on average. This would indicate that the Proposed development would account for 971 dogs within the dog owning dwellings.

5.17 The Proposed Development therefore has the potential to contribute to substantial increases in visitation to the TBH SPA, including by dog walkers who, as outlined above, are the key demographic of regular visitors.

5.18 However, the 2023 visitor survey found that approximately 4% of all visitors, the equivalent of 44 groups, were visiting from Wokingham. This remains largely consistent with the findings of the 2018 visitor survey which identified 33 groups from Wokingham, the equivalent to 4% of 2018 visitor numbers (Southgate *et al*, 2018).

5.19 Given that the visitor survey would not have intercepted every visiting household to the TBH SPA, providing data on visitor access for only a snapshot in time, then the above figures are likely to provide an under-representation of actual visitor numbers. Despite this, review of the 2023 visitor survey data indicates that visitation levels to Bramshill Plantation are comparatively low compared to other component parts of the SPA, and with comparatively low visitation levels from Wokingham Borough.

5.20 In the absence of mitigation, the anticipated increase in recreational pressure would therefore be low, particularly once spread across the extensive land area encompassed by the SPA. Whilst adverse effects on site integrity would be unlikely to arise when considered alone, the contribution to recreational pressure, however small, would still act in combination with other Local Plan development.

Information for Appropriate Assessment

Impact Avoidance and Mitigation

5.21 As outlined above, the key components of impact avoidance and mitigation as set out in the Thames Basin Heaths Delivery Framework comprise the delivery of SANG and contributions to SAMM.

5.22 To avoid impacts arising as a result of the Proposed Development, two new areas of bespoke SANG are to be provided within the Site, connected by SANG ‘Links’ (described further below). These new SANGs will form part of an existing SANG network, providing extensive areas of recreational greenspace for new and existing residents.

Proposals for Bespoke SANG

5.23 SANGs are open spaces that are designed to provide an attractive, more convientient year-round alternative recreational area to the TBH SPA for residents of new housing, as well as existing residents in the surrounding area, so that a net increase in recreational pressure on the TBH is avoided.

5.24 Initially, a smaller SANG to the west of the River Loddon and a linear SANG running along the eastern side of the river were proposed to Natural England. These two sites were the subject of the site meeting undertaken with Natural England on 10th March 2025. The feedback from this meeting is shown in **Annex 2**.

5.25 Following the initial meeting, changes were made to the proposed SANG based on the feedback. This included increasing the size of the smaller SANG and changes to the layout of the linear SANG. These changes were presented to Natural England in a virtual meeting on 29th April 2025, with the subsequent feedback shown in **Annex 3**.

5.26 The SANG proposals as set out in this report and further detailed in the SANG Delivery Plan (EPR, 2025) have been formulated based on the feedback provided by Natural England as set out above. Two SANGs are proposed to be delivered as part of the Proposed Development. The Western SANG covers approximately 26.85ha of existing agricultural land within the wider open greenspace of the Proposed Development. A circular route of 2.6km will be made available within the SANG, with a network of footpaths providing shorter walking routes for visitors if preferred. The Eastern SANG, measuring approximately 13.55ha, is located on the edge of the Proposed Development and includes a circular walking route of 1.83km. The locations of these SANG in relation to the Proposed Development are shown on **Map 11.17.2**.

5.27 In addition, a further 18.35km of land will be provided as SANG 'Link'. This land does not meet the criteria for SANG, and therefore cannot contribute to the total mitigation capacity (in terms of dwelling number mitigated), however, it is nonetheless considered to be a vital component of the overall HRA mitigation strategy, to providing access for local residents between the Eastern SANG and wider open greenspace. This land will provide footpaths through semi-natural habitats providing additional walking route options and increasing the Site's accessibility. Given the importance of the SANG Links for promoting accessibility, the SANG Links will also be secured in perpetuity alongside the main SANG areas.

Quantum of SANG Required

5.28 The Proposed Development lies between the 400m-5km and 5-7km buffer zones. Part of the Proposed Development lies further than 7km from the TBH SPA and therefore requires no mitigation measures based on current guidance. An estimate of dwellings and populations (based on an average occupancy of 2.4 people per household) within each buffer zone is set out in **Table 5.1** below.

Table 5.1: Proposed Development within Thames Basin Heaths Mitigation Zones

SPA Mitigation Zone	Approximate Number of Units	Population (units x 2.4 person occupancy)
Within 400m-5km Zone	700	1,680
Within 5km-7km Zone	2,100	5,040

5.29 Policy NE2 of the Update Local Plan requires a SANG capacity of 8ha per 1000 new residents for development within the 400m-5km buffer zone. For new residential development within 5-7km this figure may be reduced. Based on this, a total of 24.33ha of SANG is considered necessary to mitigate the Proposed Development, as set out in **Table 5.2** below.

Table 5.2: Proposed Development SANG Requirement

SANG Requirement	SANG Requirement	Land Required (ha)
Within 400m-5km Zone	8ha / 1,000 people	13.44
Within 5km-7km (low range)	1.73ha/1,000 people	8.72
Within 5km-7km (high range)	2.16ha/1,000 people	10.89
Total	**Low Range:**	**22.16**
	High Range:	**24.33**

5.30 The figures as set out above were provided to Natural England during the consultation process, during which no objections were raised.

SANG Provision and Capacity Discounting

5.31 With the delivery of the Proposed Eastern and Western SANG, a total of 40.40ha of SANG will be provided as part of the Proposed Development. Based on the requirements as set out in **Table 5.1** above, this represents an overprovision of SANG.

5.32 However, based on existing public access and retained structures, a level of capacity discounting is required.

Public Rights of Way

5.33 The Western SANG is subject to a degree of baseline recreational use along the existing Public Right of Way (PRoW) network (**Map 11.17.3**). The SANG mitigation capacity must therefore be discounted to reflect the existing levels of visitor access.

5.34 The Site is not existing publicly accessible land, however several legally accessible PRoWs transverse the proposed SANG. Schedule 12A of the Highways Act 1980 sets out the legal basis for the use of PRoW. There is no common minimum width that applies to all PRoW, however landowners are required to keep PRoW free from obstructions with a minimum clearance width of 1m for footpaths. **Table 5.3** below sets out the physical area within the proposed SANG that existing visitors to the Site have a legal right to access.

Table 5.3: Existing publicly accessible land associated with PRoW within the Proposed SANG

PRoW	Length within proposed SANG (m)	Clearance width (m)	Accessible area (m^2)
5	866	1	866
6	236	1	236
Total accessible area of PRoW within Western SANG			1,102

5.35 Only 0.11ha of the Proposed SANG is therefore legally accessible to visitors, and this is the area within which existing visitor use should be taken into account when calculating the area of land remaining that can provide SANG mitigation capacity for the Proposed Development.

5.36 Bracknell Forest Council has, in agreement with Natural England, used a particular methodology to calculate SANG mitigation capacity discounts for open spaces proposed as strategic SANG that have an existing level of public access. The methodology is set out in their Thames Basin Heaths SPA Supplementary Planning Document (2018). The method involves calculating the number of visits made to an area of open space per year, taking into account seasonal variations in visitation, then using the frequency of visitation data to calculate the total number of visitors per year. The number of existing visitors to a site is then discounted from the available mitigation capacity, that being the number of people that could be 'absorbed' by an area of land based on a specific SANG provision rate.

5.37 To provide data to inform the mitigation capacity discounts, visitor surveys were undertaken on Footpaths 5 and 6 in May 2025. Further details of the surveys and discounting calculations can be found in **Annex 5**.

5.38 The SANG capacity calculation for the publicly accessibly parts of the Proposed SANG, which as detailed above related to the legally accessible areas of PRoW land rather than the entire SANG, is set out in **Table 5.4** below.

Table 5.4: SANG capacity discount for publicly accessible parts of Proposed SANG.

Total visits to PRoW per annum	Equivalent number of visitors per annum	Accessible PRoW area (ha)	Capacity to mitigate (number of people absorbed based on baseline SANG provision rate)	Residual mitigation capacity	Residual area of SANG available for mitigation
2,999	62	0.11	14	0	40.29

Existing Structures

5.39 Both the Eastern and Western SANGs include pylon structures. As the footprint of these structures cannot support recreational activity, their area is removed from the overall SANG provision.

5.40 Pylons within the Western SANG occupy 144m^2, and 72m^2 within the Eastern SANG. This therefore reduces the overall SANG provision by 0.022ha.

Overall SANG Provision

5.41 Taking into consideration the capacity discounts arising from the presence of public footpaths and pylons, the total provision of SANG to be delivered within the Proposed Development is 40.24ha. This is summarised in **Table 5.5** below. As outlined above, the SANG Link does not contribute to the overall SANG provision.

Table 5.5 Summary of SANG discounting and overall SANG provision

Proposed SANG	Actual Area (ha)	PRoW Discount	Pylon Discount (ha)	SANG Provision Area
Western	26.85	0.11	0.014	26.73
Eastern	13.55	0	0.008	13.54
Total	**40.40**	**0.11**	**0.022**	**40.27**

SANG Design

5.42 Regard has been given to Natural England's 'Guidelines for Creation of Suitable Alternative Natural Greenspace (SANG) – August 2021', responses received during the consultation process and Site conditions observed during the design of the Proposed SANGs.

5.43 Principals of SANG design are set out within the SANG Delivery Plan (EPR, 2025), with details to be provided through a detailed SANG Creation and Management Plan, to be secured via planning condition or obligation.

Noise

5.44 Both Proposed SANGs are located within proximity of main roads. The Eastern SANG lies to the south of the M4 motorway, whilst the Western SANG abuts the A327 to the south. Noise assessments have therefore been used to inform SANG design and ensure that the SANGs do not encompass land where ambient noise levels exceed 60 decibels.

5.45 The noise modelling is set out in Chapter 15: Noise and Vibration of the Environmental Statement and the modelling output in relation to the SANG boundaries can be seen in **Annex 6**.

Screening for Urban Intrusions

5.46 The Eastern SANG is located within close proximity of the M4 motorway and the Proposed Development, whilst the Western SANG sits alongside a main road and existing public footpath which is intended for use as an active travel route from the Proposed Development.

5.47 To ensure there are no urban intrusions within the Proposed SANGs, and ensuring a natural feel is retained within the SANGs, screening will be incorporated. The screening will comprise native planting, to include trees and scrub to screen visual and audible intrusion which may be associated with the surrounding environs.

Dog Friendly Access

5.48 With dog-walkers forming the core visitor demographic to the TBH SPA, attractiveness to dog-walkers is a key requirement for SANGs in order to successfully divert visitors away from the SPA.

5.49 The Proposed SANGs will allow for off-lead dog walking by providing a secure space for dogs to roam. SANG perimeters will be enclosed with dog-proof fencing where required, either timber post-and-wire or post-and-rail construction with stock netting. Pedestrian entrances to SANGs will comprise of self-closing gates to maintain a secure perimeter.

5.50 The SANGs will provide large open areas where dogs will be able to run freely and safely. Features to increase the attractiveness of the SANGs to dog-walkers will be incorporated, such as ponds with shallow beaches for easy dog access for dog dipping.

Circular Walking Routes

5.51 The Western SANG will include a circular walking route of 2.6km, exceeding the 2.3km minimum required by Natural England's SANG criteria. Furthermore, shorter routes will be available. These are shown indicatively in **Annex 7**.

5.52 The Eastern SANG includes a circular walking route of 1.8km but provides opportunities for longer routes via the SANG link which facilitates access to the Country Park, Western SANG and wider SANG network, as outlined below. The indicative routes are shown in **Annex 8**.

Naturalistic Space

5.53 Both SANGs currently comprise of agricultural land, including grazed pasture and arable land. The Eastern SANG also includes grassland and wetland habitats, including reedbeds. Habitat creation works will be undertaken to increase the diversity of semi-natural habitats present and create a more naturalistic space to attract new and existing residents.

5.54 The Western SANG will include areas of woodland pasture type habitats. This will comprise a mosaic of habitats to include grazed species-rich grasslands with scattered trees. In the more frequently inundated areas, lowland meadow type habitats comprising of plant communities typical of floodplain meadows will be established to recreate historic habitats.

5.55 Existing grasslands within the Eastern SANG will be diversified to create species-rich grasslands of benefit to local biodiversity and providing more interesting habitats for visitors. Areas of scrub and tree planting will further diversity the habitats creating a mosaic of features. Barkham Brook runs through the centre of the Eastern SANG and will be sensitively managed to maintain its ecological interest. The provision of alternative water features for dogs, as outlined above, will be considered to prevent excessive use of the watercourse.

SANG Infrastructure

5.56 SANG site furniture will include wooden signage, interpretation boards and bins, the exact locations of which will be confirmed through a detailed SANG Creation and Management Plan, to be secured via planning condition or obligation.

5.57 All furniture will be low-key and minimalistic, comprised of timber construction (or timber effect) and discreet 'rustic' design in keeping with furniture provided in adjacent SANGs which remain under the management of the University of Reading.

SANG Accessibility and Permeability

5.58 Both SANGs are located within walking distance of the Proposed Development, with the Eastern SANG located approximately 75m from the closest residential development and the Western SANG approximately 380m. Furthermore, the Eastern SANG will include a car park to provide access for visitors arriving by car with a provision of 1 car parking space per ha.

Flooding

5.59 Parts of the Western SANG are subject to regular flooding during the winter months. Whilst a shorter circular route will remain available on higher land during 'usual' flooding events, accessibility within the Western SANG will be increased through the use of boardwalks. This will allow for increased access during periods of inundation.

5.60 The Appeal Decision issued in relation to the creation of Langley Mead SANG (appeal ref: APP/Z0360/W/19/3235895) in 2019 confirmed that the creation of SANG within the floodplain "*would allow continued recreational use in the event of flooding.".* The delivery of SANG within the floodplain can therefore be demonstrated to provide suitable recreational facilities and has been agreed in principle with Natural England (**Annex 3**).

SANG Phasing

5.61 For large multi-phase housing developments, the phased delivery of SANG alongside the phased construction and housing occupation is an established approach.

5.62 In order to ensure that the phased delivery of SANG does not compromise its ability to secure impact avoidance from the outset, the essential SANG quality features that are required to make the SANG attractive and effective must be delivered from first occupation.

5.63 To that end, the Western SANG (incorporating a 2.6km circular walking route) will be delivered in full and be operational prior to first occupation of the Proposed Development. With a capacity of 36.73ha, at a provision rate of 8ha per 1,000 new residents, the Western SANG alone will provide sufficient mitigation for the first 1,391 new residential dwellings.

5.64 The Eastern SANG and SANG Link will be delivered and be operational prior to the occupation of the 1,392nd residential dwelling. At this point the Western SANG will have no remaining mitigation capacity and additional capacity in the form of the Eastern SANG will be required to avoid an adverse effect on the TBH SPA.

Open Greenspace Network

5.65 The SANGs to be delivered as part of the Proposed Development will form part of a wider existing open greenspace network managed by the University of Reading. This includes existing SANG, which are operational and secured in-perpetuity. These SANGs, as shown on **Map 11.17.4**, include:

- Langley Mead SANG (18.21ha);
- Ridge SANG (23.65ha); and
- Ridge SANG Extension (6.58ha).

5.66 Furthermore, an extension to Langley Mead SANG measuring 21.66ha is currently being implemented. These existing SANGs will be linked to the Proposed SANGs through new and existing footpaths, creating an extensive network of open greenspace within the local area.

5.67 These SANGs are well established and regularly used by local visitors. For example, visitor surveys undertaken at Langley Mead in 2022 estimated annual visitation numbers to be in the region of 60,000 visits per year. The results also indicate that people visiting Langley Mead SANG are less likely to visit the TBH SPA as a result, with 65% of visitors visiting the SPA less often since Langley Mead opened.

Strategic Access Management and Monitoring (SAMM)

5.68 Alongside the provision of SANG, the Proposed Development will make SAMM contributions to be secured via a S106 Agreement. The total cost to be contributed will be calculated on a per dwelling basis, depending upon the number of bedrooms, in line with the current rates set out by Wokingham Borough Council in their 'Advice for Developers[1]'.

Conclusion

5.69 With the implementation of the impact avoidance measures as outlined above, the Proposed Development will not result in an adverse effect on the integrity of the TBH SPA from increased recreational pressure, either alone or in combination with other plans and projects.

[1] Available at https://www.wokingham.gov.uk/planning-policy/advice-developers/thames-basin-heath-special-protection-area

6. AIR QUALITY

6.1 This section of the IfHRA report considers the potential effects of changes to air quality generated during the operational phase of the Proposed Development on the TBH SPA in view of the above-described sensitivities of the these sites and its qualifying features, and available information about the current and potential future levels of airborne and deposited pollution that could occur as a result of traffic generated by the Proposed Development, either alone or in combination with other plans and projects.

6.2 Where the potential for likely significant effects is identified, the scope of any specific impact avoidance and mitigation measures is also considered as part of an AA.

Relevant Background Information

National Air Quality Strategy & Trends

6.3 Under the requirements of the Environment Act 1995, the UK government published an Air Quality Strategy (AQS). The AQS sets out the UK's national standards and objectives for ambient air quality, and measures to help achieve the objectives. The overall aim of the AQS is to achieve steady improvement in air quality into the long term. The objectives are transcribed into regulations in the Air Quality (England) Regulations 2000, as amended.

6.4 In 2019, the Government published their Clean Air Strategy. The Strategy sets out the measures that the Government intends to take to achieve the legally binding international targets to reduce emissions of key pollutants.

6.5 The deposition of both oxidised nitrogen (NOx, primarily NO_2) and reduced nitrogen (primarily from ammonia – NH_3 and ammonium ions – NH_4^+) contribute to total nitrogen deposition, via dry and wet deposition. National emissions of NO_X have decreased substantially over recent decades and are expected to decline further in the future. Emissions of NH_3, which are dominated by the agricultural sector, have however only marginally decreased in recent years and even increased in some areas of the UK. Under the National Emissions Ceilings Regulations, the UK is legally required to implement measures to reduce emissions of key pollutants, including NH_3 and NO_X, by 8% and 55% respectively by 2029 over 2005 base emissions, and by 16% and 73% respectively post 2030. The UK's National Air Pollution Control Programme (NAPCP), including the Clean Air Strategy in England, is expected to exceed these emission reduction targets such that a 17% decrease in total N deposition onto protected priority sensitive habitats is expected, with a predicted 18.9% decrease from the 2016 base year. Whilst the decrease will not be uniform over all sites, it is reasonable to conclude that background NH_3 concentrations and N deposition rates will decrease in the future.

Critical Levels and Loads

European CAFE Directive (2008/50/EC) and Air Quality Standards Regulations 2010

6.6 The Directive details air quality limit values, target values, and Critical Levels for a number of air pollutants established by the European Parliament and Council for the protection of human health, vegetation and ecosystems. These have been transposed into UK legislation by the Air Quality Standards Regulations 2010 (as amended).

United Nations Economic Commission for Europe Critical Loads

6.7 The United Nations Economic Commission for Europe (UNECE) has set Critical Loads for N-Deposition for specific sensitive ecosystems (UNECE, 2003).

The Air Pollution Information System (APIS)

6.8 The Air Pollution Information System (APIS) is the UK's principal source of information on pollutant levels, including at designated nature conservation sites (SAC/SPA/SSSI), and on the sensitivity of their component habitats, providing a continually updated web-based data resource.

6.9 APIS sets out the relevant environmental standards for pollutant types (as defined by the 2010 Regulations and UNECE), which vary by habitat type where Nitrogen (or N) deposition is concerned. Critical Levels define the environmental standard for airborne gaseous pollutants (NOx and NH_3) and Critical Loads define the environmental standard for deposited pollutants (N deposition).

6.10 Critical Levels and Loads (referred to collectively as the 'CL') are defined as:

> *Critical Level (ug/m3): "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge".*
>
> *Critical Load (kg N/ha/yr): "a quantitative estimate of exposure to one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge."*
>
> *For NOx the Critical Level for all habitats is a concentration of 30µg/m^3 and for NH_3 the Critical Level for all higher plant habitats (such as those that are the subject of this report) is a concentration of 3µg/m^3 (the CL for lower plant habitats, including those supporting sensitive lichens and bryophytes, is 1 µg/m^3).*

6.11 For N deposition the Critical Load is habitat specific, with lower and upper ends of a CL range cited for application in different circumstances (for example differing hydrological or management regimes); in practice there is rarely sufficient information to justify use of anything but the lower CL, and lower CLs are used throughout this assessment on a precautionary basis.

6.12 Whilst the TBH SPA's Annex 1 birds are not known to be directly affected by air pollution, Nightjar are also not sensitive to air pollution impacts on their supporting habitat where the broad habitat type is coniferous woodland. The specific sensitivities to air pollution and CLs cited by APIS as relevant to the assessment of air pollution effects on the TBH SPA are set out below in **Table 8.1** below.

6.13 When pollutant loads (or concentrations) exceed the CL, it is considered that there is a risk of harmful effects. A value in excess of the CL is termed the 'exceedance'. A larger exceedance is often considered to represent a greater risk of damage, although other factors also influence this.

Natural England's Approach to Air Quality Assessment

6.14 Natural England's guidance to Local Authorities regarding air quality assessment and HRA (Natural England, 2018) takes account of case law of relevance to air quality assessment (the

'Wealden Judgment') and describes the screening threshold for appropriate assessment as follows:

> *"widely accepted Environmental Benchmarks for imperceptible impacts are set at 1% of the critical load or level" [our emphasis].*

6.15 Critical Levels and Loads (referred to collectively as the 'CL') are defined by the UK Air Pollution Information System (APIS) as:

> *Critical Level (ug/m3): "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge".*
>
> *Critical Load (kg N/ha/yr): "a quantitative estimate of exposure to one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge."*

6.16 Natural England's (2018) guidance advocates the following stepwise approach to assessing the potential for likely significant effects from air pollution:

1) Does the proposal give rise to emissions which are likely to reach a European [International] site?

2) Are the qualifying features of sites within 200m of a road sensitive to air pollution?

3) Could the sensitive qualifying features of the site be exposed to emissions?

4) Application of screening thresholds:

4a) Apply the threshold alone - consider the contributions of the project alone and whether they could exceed 1% of the CL or a change of more than 1,000 Average Annual Daily Trips (AADT) (or 200 Heavy Duty Vehicles, HDV) [our emphasis];

4b) Apply the threshold in-combination with emissions from other plans and projects - consider the contributions of the project in addition to other live plans and projects (but see further below) and whether collectively they could exceed 1% of the CL or a change of more than 1,000 AADT (or 200 HDV);

5) Advise on the need for Appropriate Assessment where thresholds are exceeded, either alone or in-combination:

- If step 4 (a and b) does not result in exceedance of the screening threshold, then the potential for likely significant effects either alone or in combination can be screened out, and further investigation as part of an AA is not required;

- If step 4 (a and/or b) results in exceedance of the screening threshold, then the need for AA is triggered. This is because the development either alone or in combination is predicted to contribute pollutants to a site at a level above which harm could occur, irrespective of whether background levels already exceed the CLs.

The guidance provides further advice on the information that should be considered as part of an AA, which includes, amongst a plethora of factors, the potential for areas subject to air quality exceedance to coincide with sensitive qualifying features, and the specific conservation objectives for the sites concerned and how these relate to existing, and future predictions of, background levels of pollutants.

6.17 Natural England's 2018 guidance comments on the scope of in-combination assessment:

"4.44 It is generally well-established that the scope of an in-combination assessment is restricted to plans and projects which are 'live' at the same time as the assessment being undertaken. These can potentially include:

- *The incomplete or non-implemented parts of plans or projects that have already commenced;*
- *Plans or projects given consent or given effect but not yet started;*
- *Plans or projects currently subject to an application for consent or proposed to be given effect;*
- *Projects that are the subject of an outstanding appeal;*
- *Ongoing plans or projects that are the subject of regular review and renewal;*
- *Any draft plans being prepared by any public body;*
- *Any proposed plans or projects that are reasonably foreseeable and/or published for consultation prior to application; and*
- *As stated above, when considering this scope, competent authorities can be mindful of the assessment, reasoning and conclusions included in any previous HRAs for these plans or projects." [our emphasis]*

Assessment Methodology

6.18 The methodology used to assess the potential for significant effects from air quality changes impacting upon on ecological sites during the operational phase is based on Natural England's guidance regarding air quality assessment of International sites, described above (Natural England, 2018).

6.19 International sites within 200m of an "affected road", a road where increases of more than 1,000 AADT (or 200 HDV) are predicted (by relevant traffic models), can be affected by airborne NOx and NH_3 (ammonia) emissions arising from the additional traffic generated, and subsequent deposition of nitrogen from air to the ground (nitrogen deposition or 'N deposition'). N deposition can both acidify and enrich a site with nutrients, but it is difficult to separate effects due to eutrophication and acidification.

6.20 200m is set as the potential ZoI for air pollution impacts on International Sites, because traffic generated pollutant levels drop off significantly within the first 50m from the roadside and concentrations approach background levels by 200m (Laxen & Marner, 2008; Ricardo-AEA, 2016). However Natural England note that, whilst the specification of a 200m wide corridor is generally appropriate, where there is credible risk of impacts beyond 200m then the study area should be expanded.

6.21 The transport data was assessed by Abley Letchford Partnership (ALP) Ltd to determine the predicted AADT generated by the Proposed Development. Further details on the project-specific transport model can be found in **Chapter 17**. In summary, the transport model is derived from the Wokingham Strategic Transport model (WSTM), taking into account committed development and other planned growth in the area.

6.22 The core transport assessment model scenarios available to inform the assessment of potential air quality effects are as follows:

- 2025 Baseline;
- Do Minimum 2040 – Future baseline, to include future Local Plan growth and other committed development; and
- Do Something 2040 – Future Baseline, to include future Local Plan growth, other committed development and the Proposed Development of 2,800 homes and the new M4 bridge crossing.

6.23 In line with Natural England guidance (2018), traffic growth associated with the Wokingham Local Plan Update should be scoped out of the in-combination assessment on the basis that the plan has the potential to generate significant air pollution effects in its own right which should be, and has been, subject to plan-level HRA.

6.24 Natural England's guidance (2018) states:

> *"4.47 In general terms, it is important for a competent authority to remember that the subject plan or project remains the focus of any in-combination assessment. Therefore, it is Natural England's view that care should be taken to avoid unnecessarily combining the insignificant effects of the subject plan or project with the effects of other plans or projects which can be considered significant in their own right. The latter should always be dealt with by its own individual HRA alone. In other words, it is only the appreciable effects of those other plans and projects that are not themselves significant alone which are added into an in-combination assessment with the subject proposal (i.e. 'don't combine individual biscuits (=insignificant) with full packs (=significant)')."* [our emphasis]

Ecological Assessment of Air Quality Impacts (Operational Phase only)

6.25 Traffic from the Proposed Development is likely to head into Reading or Wokingham as part of a standard daily commute. Heading into Wokingham, traffic would be required to pass along the roads which pass within 200m of component SSSI's of the TBH SPA. A total of 31 link roads within proximity of the TBH SPA have been reviewed to assess the change in AADT. These link roads run adjacent to Broadmoor and Bagshot Woods and Heaths SSSI, Bramshill SSSI and Castle Bottom to Yateley and Hawley Commons SSSI, all of which are component SSSI's of the TBH SPA. They are shown in relation to the road links on **Map 11.17.5**.

6.26 Trips on these links arising as a result of the Proposed Development could therefore act alone or in combination with trips arising from other plans and projects to potentially exceed the aforementioned screening threshold, with the consequential risk of adverse effects from changes in air quality.

6.27 The transport model predicts that the change between the 2040 Do Minimum and the 2040 Do Something (the 'Process Contribution' or 'PC' from the Proposed Development) will result in an increase of less than 1,000 AADT (or 200 HDV) on all identified links. The full results can be found in **Annex 9**.

6.28 The Proposed Development alone, therefore, does not exceed the screening threshold whereby significant effects arising from changes to air quality are likely to occur, i.e. the potential for likely significant effects can be screened out in accordance with Natural England guidance, as set out above.

6.29 The Wokingham Strategic Transport Model (WSTM) upon which the project-specific transport model is based and which was used to inform the Reg 19 Local Plan Update HRA, includes Local Plan growth and other committed development within all future scenarios. This means that it is not possible to isolate the potential impacts of committed development acting in combination with the Proposed Development from the impacts of the Local Plan which, as outlined above, should be scoped out of the in-combination assessment in accordance with Natural England's guidance.

6.30 However, as stated above, the project-specific transport model utilises traffic flows taken from the WSTM, which includes the Proposed Development as an allocated site under Local Plan Update Policy SS13. Detailed air quality modelling has been carried out as part of the Local Plan Update HRA, which has considered the effects of the Local Plan Update (including the Proposed Development) alone and in combination with other committed development, including growth associated with plans and committed developments within neighbouring Boroughs. Therefore, the conclusions of the in-combination assessment carried out for the Local Plan Update HRA may be used to inform the conclusion reached as part of the in-combination assessment for the Proposed Development.

6.31 Since Local Plan Update development should be scoped out of the project-level in combination assessment, as explained above, the pollutant concentrations and deposition rates modelled as part of the Local Plan Update HRA, and the conclusions reached, reflect what should be considered 'worst-case' in the context of the Proposed Development project-level HRA.

6.32 The Reg 19 HRA of the Local Plan Update has undertaken air quality modelling, based upon the WSTM. The air quality model (Appendix D of the Reg 19 HRA) utilises the following scenarios:

- *"2021 Existing baseline*
- *2040 Do Nothing (DN) – a theoretical baseline with no traffic growth between the baseline and 2040, but with anticipated reduction in emissions from traffic due to future changes in vehicle type and background concentrations (2030 backgrounds).*
- *2040 Do Minimum (DM) – the 'Reference Case' traffic model scenario including the 2026 Local Plan excluding Hall Farm/Loddon Valley Development* [Policy SS13] *or other LPU development, but includes committed developments and anticipated future reductions in emissions from traffic due to future changes in vehicle type and background concentrations (2030 backgrounds); and*
- *2040 Do Something (DS) – the 'Local Plan Scenario 1b' includes forecast growth on the local network with mitigation (under Local Plan Scenario 1B) plus Hall Farm/Loddon Valley development (3,930 dwellings)* [Policy SS13] *and other Local Plan Update*

development (i.e. south Wokingham SDL extension site with totals 1,150 houses and other smaller Local Plan Update site allocations with a total quantum of 3,762 dwellings and with anticipated future reductions in emissions from traffic due to future changes in vehicle type and background concentrations (2030 backgrounds)."

6.33 Furthermore "*The results for the Do-Minimum and Do-Something scenarios have been compared to show the impacts of the LPU growth scenario 'in isolation'. The results of the Do-Nothing and Do-Something scenarios have been compared to identify the potential 'in-combination' impacts associated with the growth scenario, other projects and plans*."

6.34 Assessing modelled changes in NO_x, NH_3 and N deposition, the Reg 19 HRA concluded that there would be no adverse effect on the integrity of the TBH SPA from changes to air quality arising as a result of the Local Plan Update (which includes the Proposed Development), either alone or in-combination with other plans and projects. This conclusion can therefore be adopted as the conclusion reached for the in-combination assessment of the Proposed Development.

6.35 A summary of the Local Plan Update air quality assessment can be found below.

NO_x

6.36 The change in NOx concentrations for the modelled receptors on transects associated with the component SSSI's closest to the Proposed Development (Broadmoor and Bagshot Woods and Heaths SSSI, Bramshill SSSI and Castle Bottom to Yateley and Hawley Commons SSSI) was found to increase by no more than 0.4% of the Critical Level (30 μgm^{-3}) between the 2040 Do Minimum Scenario and the 2040 Do Something Scenario, with the majority of receptors predicted to be subject to changes of between 0.0% and 0.2% of the Critical Level. This falls below the 1% screening threshold, and as a result, adverse effects arising from changes in NO_x levels were not predicted as result of the Update Local Plan Update (which includes the Proposed Development) alone.

6.37 When considered in-combination, changes in NOx levels at the majority of receptors were found to exceed the 1% screening threshold. However, it was found that the total NO_x forecast (the 'Predicted Environmental Concentration' or 'PEC') did not exceed the Critical Level on any of the modelled receptors within the TBH SPA. It was therefore concluded that adverse effects on the TBH SPA from changes in NO_x levels resulting from the Local Plan Update (including the Proposed Development) would not arise, either alone or in-combination with other plans and projects.

Ammonia

6.38 In order to be precautionary, the Local Plan Update air quality modelling applied the lower Critical Level for NH_3, of 1 μgm^{-3}, on the basis that sensitive lower plants (lichens and bryophytes) could be present as qualifying features or interest features associated with the International sites assessed. When comparing the 2040 Do Minimum Scenario and the 2040 Do Something Scenario, , changes in NH_3 concentrations exceeded more than 1% of the Critical Level on 12 transects associated with component SSSI's closest to the Proposed Development, with changes ranging from 1.0% to 4.2% of the CL. Similarly, the in-combination assessment found that the CL was exceeded by 1% or more on the majority of transects.

6.39 However, the assessment went on to consider that the upper CL for NH_3 - 3µgm^{-3} - should be applied to assess adverse effects on the TBH SPA (where it does not overlap with other Internationally designated sites) on the basis that sensitive lichens and bryophytesare not a habitat component involved in supporting the Annex I birds for which the SPA is designated.Once the upper CL was applied, changes in NH3 concentrations did not exceed more than 1% of the CL on any TBH SPA transect, either alone or in-combination with other plans and projects.

6.40 Therefore, adverse effects arising from changes in ammonia levels resulting from the Local Plan Update (which includes the Proposed Development) were not predicted on any of the component parts of the TBH SPA within proximity of the Site, either alone or in-combination with other plans and projects.

Nitrogen Deposition

6.41 When comparing the 2040 Do Minimum Scenario and the 2040 Do Something Scenario for N deposition, the Critical Load of 5 kg N/ha/yr was exceeded by more than 1% on 13 transects associated with component SSSI's closest to the Proposed Development, with increases in N deposition ranging from 1.0% to 4.6% of the CL.

6.42 Despite this, the forecasted N deposition rates on 6 of the transects was very small and considered to be well within the range of normal background variation, with levels of 0.05kgN/ha/yr or lower. Furthermore, on these transects the N deposition rates were considered to be too small to make a meaningful contribution to any in-combination effect. As such, no adverse effect on these TBH SPA transects as a result of the Local Plan Update (which includes the Proposed Development) was predicted by the Local Plan Update HRA, either alone or in-combination.

6.43 On those transects where N deposition rates were higher (up to 0.15 kgN/ha/yr when the Local Plan Update is considered alone, and 15.0 kgN/ha/yr when considered in combination) and in excess of 1% of the CL, it was determined that no heathland habitats, upon which the qualifying bird species of the TBH SPA principally rely, were present. Furthermore, the total future N deposition rates (the PEC) in both the Do Something and Do Minimum scenarios was found to have decreased compared to the levels recorded in the baseline year (2021). This can be attributed to the anticipated decrease in vehicle and background NO_x emissions taken into account within the air quality modelling.

6.44 The Local Plan Update HRA therefore concluded that adverse effects on the TBH SPA from changes in N deposition rates would not arise from the Local Plan Update (which includes the Proposed Development) either alone or in-combination with other plans and projects.

Conclusion

6.45 On the basis of the above analysis, no adverse effects on the integrity of the TBH SPA from changes in air quality (NOx, NH_3 and N deposition) are predicted to arise from the Proposed Development, considered alone and in combination with other plans and projects.

7. SUMMARY AND CONCLUSIONS

Summary

7.1 **Table 7.1** below provides a summary of the impact pathways considered in this Information for HRA report, the conclusion of the screening stage assessment carried out in respect of each, and a summary of the impact avoidance and mitigation strategy (IAMS) that is proposed to address the potential for likely significant effects.

7.2 The IAMS summarised below, delivered in advance of first occupation/operation and secured in perpetuity, will ensure that adverse effects on the integrity of the TBH SPA considered in this assessment will not arise as a result of the Proposed Development, either alone or in combination with other plans and projects.

Table 7.1: Summary of Information for HRA

Report Section	Impact Pathway	Scoping Result	Screening Stage Conclusion	Impact Avoidance and Mitigation Measures Proposed to Ensure No Adverse Effect and pass Appropriate Assessment test (alone and in combination)
		Thames Basin Heaths SPA		
5	Increased recreational pressure	IN	Likely Significant Effect	Bespoke SANG provision with detail to be conditioned via a SANG Creation and Management Plan Contribution to SAMM via S106 Agreement
6	Changes in air quality	IN	Likely Significant Effect	N/A – AA concluded no adverse effect on site integrity

Conclusions in Respect of the Habitats Regulations

7.3 In accordance with the Conservation of Habitats and Species Regulations 2017 (as amended), and taking into account the most recent relevant case law, it is considered that WBC can safely conclude that the proposals **will not have an adverse effect on the integrity** of the TBH SPA International Site considered in this assessment, either alone or in combination with other plans or projects.

7.4 Consequently, an AA of the proposals under Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017 (as amended) can be passed.

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