Hertfordshire County Council

Hertfordshire Minerals & Waste Local Plan

Habitats Regulations Assessment

Draft report
Prepared by LUC
June 2022

Hertfordshire County Council

Hertfordshire Minerals & Waste Local Plan
Habitats Regulations Assessment

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Chapter 1
Introduction

Background and context to this report

1.1 Hertfordshire County Council has commissioned LUC to undertake a Habitats Regulations Assessment (HRA) of the joint Minerals and Waste Local Plan (hereafter referred to as MWLP) for Hertfordshire. This report presents the methodology and findings of the HRA of the MWLP.

1.2 The purpose of the HRA is to determine if the MWLP will have likely significant effects on, and if so whether it will have adverse effects on the integrity of, any sites designated as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), or Ramsar sites.

Background to the Hertfordshire Minerals and Waste Local Plan.

1.3 The MWLP for Hertfordshire, which covers the period of 2011-2026 currently comprises of the following documents:

- Waste Core Strategy and Development Management Policies DPD 2011-2026 (adopted 5th November 2012) which sets out the Waste Management Strategy
- Waste Site Allocations Document DPD 2011-2026 (adopted on 15th July 2014) which sets out the existing waste sites and those sites with potential for future waste facilities.
- Minerals Local Plan 2002-2016 (adopted March 2007) setting out the strategy for Minerals Planning. Including strategic policies to meet the aim for mineral extraction.

1.4 The following Supplementary Planning (SPD) documents provide additional guidance on the adopted policies:

- Mineral Consultation Areas in Hertfordshire SPD (adopted November 2007) which sets out the procedure to protect resources of sand and gravel.
- Employment Land Areas of Search (ELAS) SPD (adopted November 2015) which provides planning guidance on the suitability of waste related development over 60 ELAS.

1.5 The council had been reviewing the currently adopted Minerals and Waste Local Plans through an emerging

Minerals Local Plan and emerging Waste Local Plan, as well as a draft Waste Facilities Design Guide SPD. However, in December 2021, the council approved the withdrawal of the emerging plans and SPD and bringing together the work done so far on those documents into a single MWLP.

1.6 The MWLP will set out the policies and site/area allocations for minerals and waste management development to 2040 in accordance with the National Planning Policy Framework (NPPF).

1.7 Once the MWLP is adopted, it will replace the currently adopted Minerals Local Plan, Waste Local Plan, and their SPDs.

The requirement to undertake Habitats Regulations Assessment of Development Plans

1.8 The requirement to undertake HRA of development plans was confirmed by the amendments to the Habitats Regulations published for England and Wales in 2007; the currently applicable version is the Habitats Regulations 2017, as amended. When preparing its new MWLP, Hertfordshire County Council (HCC) is therefore required by law to carry out an HRA. HCC can commission consultants to undertake HRA work on its behalf and this (the work documented in this report) is then reported to and considered by HCC as the 'competent authority'. HCC will consider this work and would usually only progress the Local Plan if it considers that the Plan will not adversely affect the integrity[1] of any European site (the exception to this would be where 'imperative reasons of overriding public interest' can be demonstrated; see paragraph 1.18). The requirement for authorities to comply with the Habitats Regulations when preparing a Local Plan is also noted in the Government's online Planning Practice Guidance[2] (PPG).

1.9 HRA refers to the assessment of the potential effects of a development plan on one or more sites afforded the highest level of protection in the UK: SPAs and SACs. These were classified under European Union (EU) legislation but, since 1 January 2021, are protected in the UK by the Habitats Regulations 2017 (as amended). Although the EU Directives from which the UK's Habitats Regulations originally derived are no longer binding, the Regulations still make reference to the lists of habitats and species that the sites were designated for, which are listed in annexes to the EU Directives:

- SACs are designated under the Habitats Regulations and target particular habitat types (specified in Annex 1) and species (Annex II). The listed habitat types and species (excluding birds) are those considered to be most in need of conservation at a European level. Designation of SACs also has regard to the threats of degradation or destruction to which the sites are exposed and, before EU exit day, to the coherence of the Natura 2000 network of European sites. After EU exit day, regard is had to the importance of such sites for the coherence of the national site network.
- SPAs are classified in accordance with Article 4(1) of the European Union Birds Directive[3] for rare and vulnerable birds (Annex I), and under Article 4(2) for regularly occurring migratory species not listed in Annex I.

1.10 The term 'European sites' was previously commonly used in HRA to refer to 'Natura 2000' sites[4] and Ramsar sites (international designated under the Ramsar Convention). However, a Government Policy Paper[5] on changes to the Habitats Regulations 2017 post-Brexit states that:

- Any references to Natura 2000 in the 2017 Regulations and in guidance now refers to the new 'national site network'.
- The national site network includes existing SACs and SPAs; and new SACs and SPAs designated under these Regulations.
- Designated Wetlands of International Importance (known as Ramsar sites) do not form part of the national site network. Many Ramsar sites overlap with SACs and SPAs and may be designated for the same or different species and habitats.

1.11 Although Ramsar sites do not form part of the new national site network, Government guidance[6] states that:

"Any proposals affecting the following sites would also require an HRA because these are protected by government policy:

[1] The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated. (Source: UK Government Planning Practice Guidance)

[2] https://www.gov.uk/guidance/appropriate-assessment

[3] Classified (a) before the day of the UK's exit from the EU (31 January 2020) in accordance with Article 4(1) or 4(2) of the European Union Wild Birds Directive for rare and vulnerable birds (as listed in Annex I of the Directive), and under Article 4(2) for regularly occurring migratory species not listed in Annex I, or (b) after exit day under the retained transposing regulations.

[4] The network of protected areas identified by the EU: https://ec.europa.eu/environment/nature/natura2000/index_en.htm

[5] https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017

[6] Defra and Natural England (2021) Guidance - Habitats regulations assessments: protecting a European site, https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

- *proposed SACs*
- *potential SPAs*
- *Ramsar sites - wetlands of international importance (both listed and proposed)*
- *areas secured as sites compensating for damage to a European site."*

1.12 Furthermore, the NPPF[7] and practice guidance[8] currently state that competent authorities responsible for carrying out HRA should treat Ramsar sites in the same way as SACs and SPAs.

1.13 The legislative requirement for HRA does not apply to other nationally designated wildlife sites such as Sites of Special Scientific Interest or National Nature Reserves; therefore, for clarity, this report uses the term 'European sites' rather than 'national site network'.

1.14 The overall purpose of an HRA is to conclude whether or not a proposal or policy, or whole development plan would adversely affect the integrity of the site in question. This is judged in terms of the implications of the plan for a site's 'qualifying features' (i.e. those Annex I habitats, Annex II species, and Annex I bird populations for which it has been designated). Significantly, HRA is based on the precautionary principle. Where uncertainty or doubt remains, an adverse effect should be assumed.

Stages of HRA

1.15 The HRA of development plans is undertaken in stages (as described below) and should conclude whether or not a proposal would adversely affect the integrity of the European site in question.

1.16 LUC has been commissioned by HCC to carry out HRA work on the Council's behalf, and the outputs will be reported to and considered by HCC, as the competent authority, before adopting the Plan.

1.17 The HRA also requires close working with Natural England as the statutory nature conservation body[9] in order to obtain the necessary information, agree the process, outcomes and mitigation proposals. The Environment Agency, while not a statutory consultee for the HRA, is also in a strong position to provide advice and information throughout the process as it is required to undertake HRA for its existing licences and future licensing of activities.

Requirements of the Habitats Regulations

1.18 In assessing the effects of a Local Plan in accordance with Regulation 105 of the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'), there are potentially two tests to be applied by the competent authority: a 'Significance Test', followed if necessary by an Appropriate Assessment which would inform the 'Integrity Test'. The relevant sequence of questions is as follows:

- Step 1: Under Reg. 105(1)(b), consider whether the plan is directly connected with or necessary to the management of the sites. If not, proceed to Step 2.
- Step 2: Under Reg. 105(1)(a) consider whether the plan is likely to have a significant effect on a European site, either alone or in combination with other plans or projects (the 'Significance Test'). If yes, proceed to Step 3.

1.19 [Steps 1 and 2 are undertaken as part of Stage 1: HRA Screening, shown in **Table 1.1**.]

- Step 3: Under Reg. 105(1), make an Appropriate Assessment of the implications for the European site in view of its current conservation objectives (the 'Integrity Test'). In so doing, it is mandatory under Reg. 105(2) to consult Natural England, and optional under Reg. 105(3) to take the opinion of the general public.

1.20 [This step is undertaken during Stage 2: Appropriate Assessment, shown in **Table 1.1**.]

- Step 4: In accordance with Reg. 105(4), but subject to Reg. 107, give effect to the land use plan only after having ascertained that the plan would not adversely affect the integrity of a European site.

1.21 [This step follows Stage 2 where a finding of 'no adverse effect' is concluded. If it cannot be it proceeds to Step 5 as part of Stage 3 of the HRA process]

- Step 5: Under Reg. 107, if Step 4 is unable to rule out adverse effects on the integrity of a European site and no alternative solutions exist then the competent authority may nevertheless agree to the plan or project if it must be carried out for 'imperative reasons of overriding public interest' (IROPI).

1.22 [This step is undertaken during Stage 3: Assessment where no alternatives exist and adverse impacts remain taking into account mitigation shown in **Table 1.1**]

[7] NPPF (2021) para 181, available from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

[8] The HRA Handbook, Section A3. David Tyldesley & Associates, a subscription based online guidance document: https://www.dtapublications.co.uk/handbook/European

[9] Regulation 5 of the Habitats Regulations 2017.

Typical stages

1.23 Table 1.1 summarises the stages and associated tasks and outcomes typically involved in carrying out a full HRA of a development plan, based on various guidance documents[10,11,12].

Table 1.1: Stages of HRA

Stage	Task	Outcome
Stage 1: HRA Screening	Description of the development plan and confirmation that it is not directly connected with or necessary to the management of European sites. Identification of potentially affected European sites and their conservation objectives[13]. Assessment of likely significant effects of the development plan alone or in combination with other plans and projects, prior to consideration of avoidance or reduction ('mitigation') measures[14].	Where effects are unlikely, prepare a 'finding of no significant effect report'. Where effects judged likely, or lack of information to prove otherwise, proceed to Stage 2.
Stage 2: Appropriate Assessment (where Stage 1 does not rule out likely significant effects)	Information gathering (development plan and European Sites[15]). Impact prediction. Evaluation of development plan impacts in view of conservation objectives of European sites. Where impacts are considered to directly or indirectly affect qualifying features of European sites, identify how these effects will be avoided or reduced ('mitigation').	Appropriate assessment report describing the plan, European site baseline conditions, the adverse effects of the plan on the European site, how these effects will be avoided or reduced, including the mechanisms and timescale for these mitigation measures. If effects remain after all alternatives and mitigation measures have been considered proceed to Stage 3.
Stage 3: Assessment where no alternatives exist and adverse impacts remain taking into account mitigation	Identify 'imperative reasons of overriding public interest' (IROPI). Demonstrate no alternatives exist. Identify potential compensatory measures.	This stage should be avoided if at all possible. The test of IROPI and the requirements for compensation are extremely onerous.

[10] UK Government Planning Practice Guidance, available from https://www.gov.uk/guidance/appropriate-assessment
[11] European Commission (2001) Assessment of plans and projects significantly affecting European Sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.
[12] The HRA Handbook. David Tyldesley & Associates, a subscription based online guidance document: https://www.dtapublications.co.uk/handbook/European
[13] Conservation objectives are published by Natural England for SACs and SPAs: http://publications.naturalengland.org.uk/category/6490068894089216
[14] In line with the CJEU judgment in Case C-323/17 People Over Wind v Coillte Teoranta, mitigation must only be taken into consideration at this stage and not during Stage 1: HRA Screening.
[15] In addition to European site citations and conservation objectives, key information sources for understanding factors contributing to the integrity of European sites include (where available) conservation objectives supplementary advice and Site Improvement Plans prepared by Natural England: http://publications.naturalengland.org.uk/category/5458594975711232

1.24 It is normally anticipated that an emphasis on Stages 1 and 2 of this process will, through a series of iterations, help ensure that potential adverse effects are identified and eliminated through the inclusion of mitigation measures designed to avoid or reduce effects. The need to consider alternatives could imply more onerous changes to a plan document. It is generally understood that so called 'imperative reasons of overriding public interest' (IROPI) are likely to be justified only very occasionally and would involve engagement with the Government.

Case law

1.25 This HRA has been prepared in accordance with relevant case law findings, including most notably the 'People over Wind' and 'Holohan' rulings from the Court of Justice for the European Union (CJEU).

1.26 The *People over Wind, Peter Sweetman v Coillte Teoranta* (April 2018) judgment ruled that Article 6(3) of the Habitats Directive should be interpreted as meaning that mitigation measures should be assessed as part of an Appropriate Assessment and should not be taken into account at the screening stage. The precise wording of the ruling is as follows:

> "Article 6(3) ……must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of measures intended to avoid or reduce the harmful effects of the plan or project on that site.

1.27 In light of the above, the HRA screening stage does not rely upon avoidance or mitigation measures to draw conclusions as to whether the MWLP could result in likely significant effects on European sites, with any such measures being considered at the Appropriate Assessment stage as relevant.

1.28 This HRA also fully considers the *Holohan v An Bord Pleanala* (November 2018) judgement which stated that:

> Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that an 'appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected, and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that those implications are liable to affect the conservation objectives of the site.
>
> Article 6(3) of Directive 92/43 must be interpreted as meaning that the competent authority is permitted to grant to a plan or project consent which leaves the developer free to determine subsequently certain parameters relating to the construction phase, such as the location of the construction compound and haul routes, only if that authority is certain that the development consent granted establishes conditions that are strict enough to guarantee that those parameters will not adversely affect the integrity of the site.
>
> Article 6(3) of Directive 92/43 must be interpreted as meaning that, where the competent authority rejects the findings in a scientific expert opinion recommending that additional information be obtained, the 'appropriate assessment' must include an explicit and detailed statement of reasons capable of dispelling all reasonable scientific doubt concerning the effects of the work envisaged on the site concerned.

1.29 In undertaking this HRA, LUC has fully considered the potential for effects on species and habitats, including those not listed as qualifying features, to result in secondary effects upon the qualifying features of European sites, including the potential for complex interactions and dependencies. In addition, the potential for offsite impacts, such as through impacts to functionally linked land, and or species and habitats located beyond the boundaries of European site, but which may be important in supporting the ecological processes of the qualifying features, has also been fully considered in this HRA.

1.30 In addition to this, the HRA will take into consideration the 'Wealden' judgement and the 'Dutch Nitrogen Case' judgements from the Court of Justice for the European Union.

1.31 *Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority* (2017) ruled that it was not appropriate to scope out the need for a detailed assessment for an individual plan or project based on the annual average daily traffic (AADT) figures detailed in the Design Manual for Roads and Bridges or the critical loads used by Defra or Environmental Agency without considering the in-combination impacts with other plans and projects.

1.32 In light of this judgement, the HRA therefore considers traffic growth based on the effects of minerals and waste development from the MWLP in combination with other drivers of growth such as non-waste development in Hertfordshire, development proposed in neighbouring districts and demographic change.

1.33 The 2018 '*Coöperatie Mobilisation for the Environment and Vereniging Leefmilieu (Dutch Nitrogen)*' judgement stated that:

> "May the positive effects of the autonomous decrease in the nitrogen deposition … be taken into account in the appropriate assessment…, it is important that the autonomous decrease in the nitrogen deposition be monitored and, if it transpires that the decrease is less favourable than had been assumed in the appropriate assessment, that adjustments, if required, be made."

1.34 The Dutch Nitrogen judgement also states that according to previous case law:

> "…it is only when it is sufficiently certain that a measure will make an effective contribution to avoiding harm to the integrity of the site concerned, by guaranteeing beyond all reasonable doubt that the plan or project at issue will not adversely affect the integrity of that site, that such a measure may be taken into consideration in the 'appropriate assessment' within the meaning of Article 6(3) of the Habitats Directive".

1.35 The HRA of the MWLP therefore only considers the existence of conservation and/or preventative measures if the expected benefits of those measures are certain at the time of the assessment. If a threshold approach is applied, it is necessary to consider the risk of significant effects being produced even if below the threshold values to ensure that there is no adverse effect on integrity of the European sites

Previous HRA Work

HRA of the Hertfordshire Waste Local Plan (Regulation 18) (2020)

1.36 LUC was commissioned to undertake a HRA of the Hertfordshire Waste Local Plan (WLP) in 2020. The HRA Screening assessment identified the need for Appropriate Assessment of the WLP. The Appropriate Assessment concluded that there was the potential for likely significant effects to European sites due to air pollution from vehicle emissions. This was concluded due to insufficient data (traffic modelling and air quality assessment) being available. However, for most of the remaining assessed effects there was sufficient evidence that there would be no adverse effects on integrity of the European sites as a result of the WLP. This HRA builds upon the information within the 2020 assessment of the WLP, where relevant.

HRA of the Hertfordshire Minerals Local Plan (2019)

1.37 LUC was also commissioned to undertake the HRA of the emerging Minerals Local Plan (MLP), in 2019. The Proposed Submission MLP was published for Regulation 19 consultation in January 2019, accompanied by the HRA report prepared by LUC. This work, and Natural England's consultation responses to the MLP and its HRA have also informed the HRA of the MWLP.

HRA of the Hertfordshire Waste Development Framework, Waste Core Strategy & Development Management Policies DPD Draft Submission version (2010)

1.38 LUC was previously commissioned to undertake an HRA of the Waste Development Framework which comprised two Development Plan Documents (Waste Core Strategy & Development Management Policies DPD and Waste Site Allocations DPD). This identified no likely significant effects against the six European sites within 10km of the Hertfordshire boundary.

Structure of the HRA Report

1.39 This chapter has introduced the requirements to undertake the HRA of the new Hertfordshire MWLP. The remainder of the report is structured as follows:

- **Chapter 2: The Minerals and Waste Local Plan** summarises the content of the MWLP that is the subject of this report.
- **Chapter 3: HRA Methodology** sets out the approach used and the specific tasks undertaken during the screening and Appropriate Assessment stages of the HRA.
- **Chapter 4: HRA Screening** describes the findings of the screening stage of the HRA.
- **Chapter 5: Appropriate Assessment** sets out the findings of the Appropriate Assessment stage of the HRA.
- **Chapter 6: Conclusions and Next Steps** summarises the HRA conclusions for the MWLP and describes the next steps to be undertaken.

Chapter 2
Hertfordshire Minerals & Waste Local Plan

Characteristics of the Minerals and Waste Local Plan relevant to the HRA

2.1 The Hertfordshire Minerals and Waste Local Plan (MWLP) seeks to ensure a steady and adequate supply of minerals, in addition to promoting and encouraging sustainable waste management through the appropriate siting of waste management facilities. The MWLP contains 27 planning policies, which bring together and update policies that were previously set out in the Waste Local Plan and Minerals Local Plan.

2.2 The vision of the MWLP is as follows:

Vision

Throughout the plan period to 2040, Hertfordshire will continue to provide a steady and adequate supply of minerals to meet identified needs and to support local economic growth. The supply of naturally occurring minerals will be conserved through the use of safeguarding, by promoting the use of secondary and recycled aggregates, and by encouraging the prior extraction of mineral before other forms of development.

Minerals development will adopt a high quality, restoration-led approach, with sites being restored at the earliest opportunity, conserving and enhancing the character and quality of Hertfordshire's landscapes and environments.

The existing network of waste management facilities will be safeguarded, and new facilities will be supported using a flexible approach to meet waste management needs, driving waste up the waste hierarchy, embracing new technologies that reduce carbon emissions, and aiming towards achieving net waste self-sufficiency.

Developments will be designed to mitigate the effects of and on climate change, with a focus on promoting waste reduction, reuse, and the recycling of materials, thereby minimising the need for disposal as part of a more circular approach to materials use.

Sustainable options for the transportation of minerals and waste will be safeguarded and encouraged. Development will seek to protect human health and amenity, protect and enhance wildlife habitats through

biodiversity gain, preserve agricultural land, and conserve and enhance the natural, built and historic environments, whilst balancing minerals and waste management needs.

2.3 The objectives of the MWLP are as follows:

Objectives

1. Ensure a steady and adequate supply of minerals to meet demand and protect mineral resources and infrastructure.
2. Encourage the appropriate location of and safeguard waste management facilities, including wastewater.
3. Encourage the sustainable use of materials, including the use of secondary and recycled aggregates, and the prior extraction of mineral before other development takes place.
4. Promote and encourage sustainable waste management facilities and practices.
5. Ensure that mineral and waste management development addresses and minimises the impacts of and contributions towards climate change through appropriate mitigation and built-in resilience measures.
6. Encourage the greater use of sustainable transport for the movement of minerals and waste, e.g. by road, rail and water.
7. Protect and positively contribute towards human health and wellbeing.
8. Protect and enhance the natural, built and historic environment.
9. Protect against flooding and safeguard water quality and quantity.
10. Recognise the importance of the minerals and waste sector in the local and wider economy as a generator of employment and its provision of infrastructure which supports businesses and communities.

2.4 There are no sites allocated within the MWLP for waste but three sites allocated for minerals development. Policy 2: Meeting Sand and Gravel Needs identifies three sites where sand and gravel development is supported within Hertfordshire, although minerals development would also be permitted outside these sites, in some circumstances. Policy 3: Meeting Waste Management Needs sets out broad locations where waste management is supported, namely existing Waste Management Sites, land allocated for employment in the Development Plan or existing employment land within the development limits of existing/new major settlements – the latter of which are listed in the policy.

2.5 **Figures 2.1-2.5** show the areas referred to in the policies in which waste or minerals development could occur; and key features such as European sites and the primary road network.

Hertfordshire Minerals & Waste Local Plan
for Hertfordshire County Council

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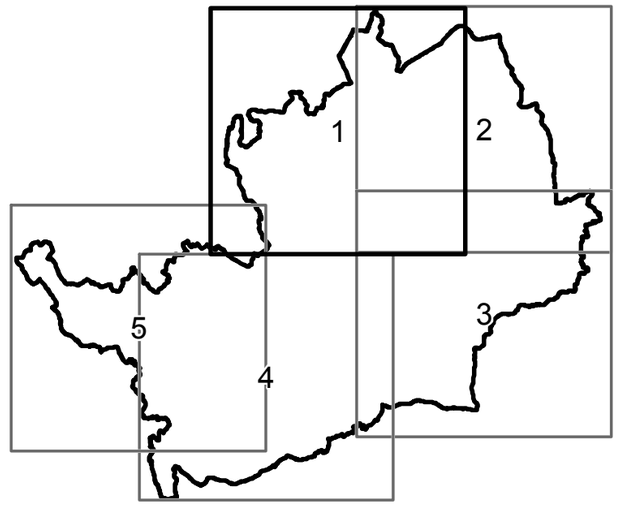
Figure 2.1: Potential Areas for Waste or Minerals Development

- Hertfordshire County boundary
- Special Protection Area (SPA)
- Waste Management Sites
- Water Recycling Sites
- Transport Infrastructure Sites
- Employment Land
- Minerals Safeguarding Areas - Sand & Gravel
- Green Belt
- Primary Route Network
- Motorway
- A Road



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Source: Source: NE, OS, ONS

Hertfordshire Minerals & Waste Local Plan
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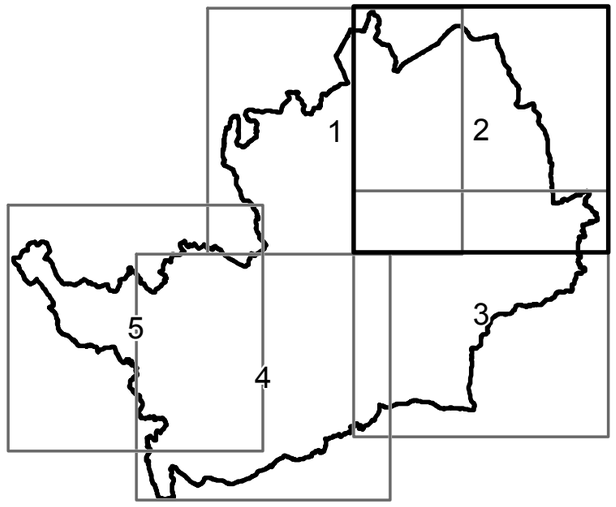
Figure 2.2: Potential Areas for Waste or Minerals Development

- Hertfordshire County boundary
- Special Protection Area (SPA)
- Waste Management Sites
- Water Recycling Sites
- Transport Infrastructure Sites
- Minerals Development Site
- Employment Land
- Minerals Safeguarding Areas - Sand & Gravel
- Green Belt
- Primary Route Network
- Motorway
- A Road



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Source: Source: NE, OS, ONS

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Figure 2.3: Potential Areas for Waste or Minerals Development

- Hertfordshire County boundary
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Ramsar
- Waste Management Sites
- Water Recycling Sites
- Transport Infrastructure Sites
- Minerals Development Site
- Minerals Allocation Site
- Employment Land
- Minerals Safeguarding Areas - Sand & Gravel
- Green Belt
- Primary Route Network
- Motorway
- A Road

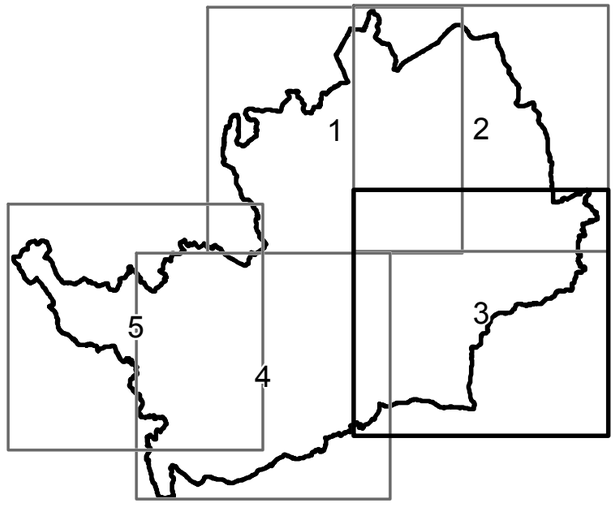

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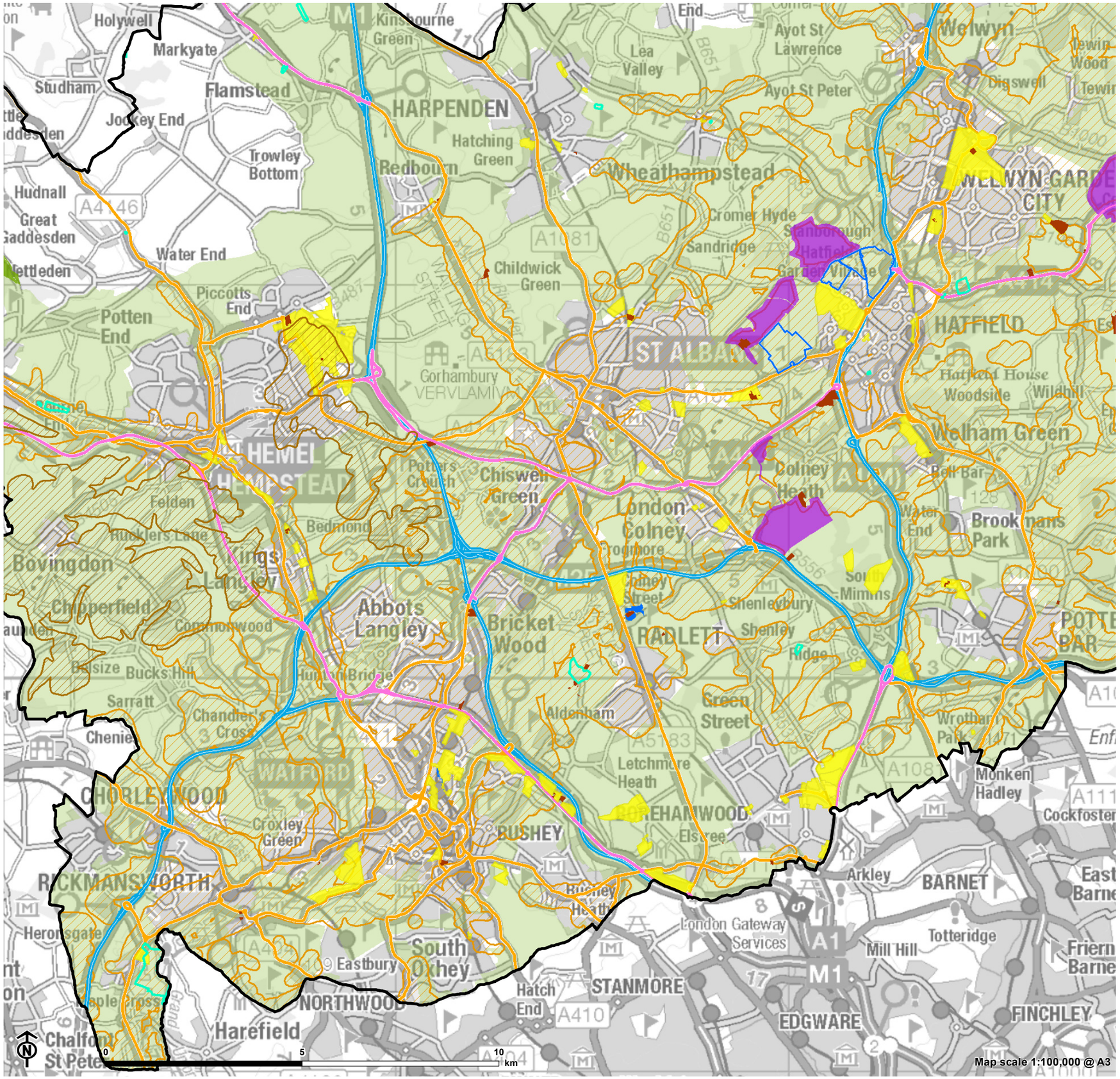
Figure 2.4: Potential Areas for Waste or Minerals Development



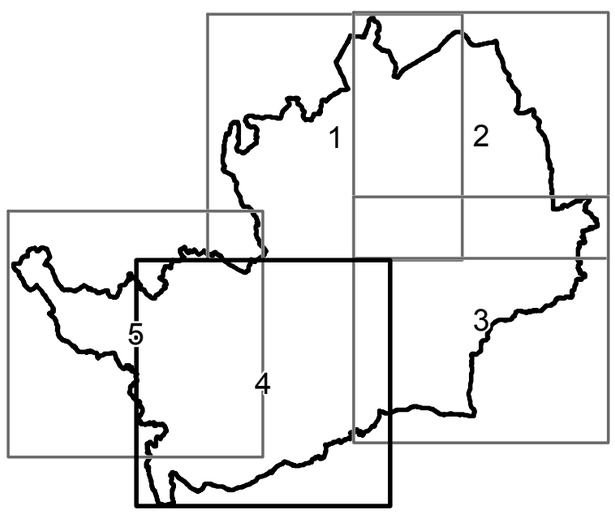


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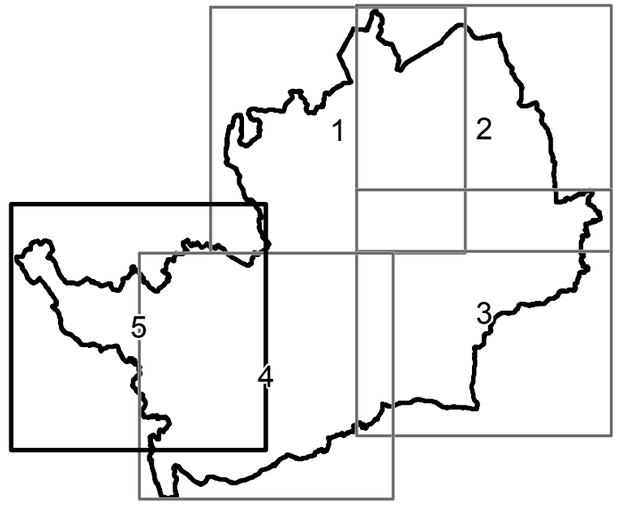
Figure 2.5: Potential Areas for Waste or Minerals Development

- Hertfordshire County boundary
- Special Area of Conservation (SAC)
- Waste Management Sites
- Water Recycling Sites
- Transport Infrastructure Sites
- Employment Land
- Minerals Safeguarding Areas - Brick Clay
- Minerals Safeguarding Areas - Sand & Gravel
- Green Belt
- Primary Route Network
- Motorway
- A Road



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Source: Source: NE, OS, ONS

Chapter 3
Approach to the HRA

Screening and Appropriate Methodology

3.1 This chapter describes the method that has been taken in the HRA of the MWLP throughout its development including the specific tasks that have been undertaken and the assumptions that underpin the HRA judgements made.

Screening assessment

3.2 HRA Screening of the plan has been undertaken in line with current available guidance and seeks to meet the requirements of the Habitats Regulations. The tasks that have been undertaken during the screening stage of the HRA and the conclusions reached are described in detail below.

3.3 The purpose of the screening stage is to:

- Identify all aspects of the plan which would have no effect on a European site, so that that they can be eliminated from further consideration in respect of this and other plans;
- Identify all aspects of the plan which would not be likely to have a significant effect on a European site (i.e. would have some effect, because of links/connectivity, but which are not significant), either alone or in combination with other aspects of the same plan or other plans or projects, which therefore do not require 'appropriate assessment'; and
- Identify those aspects of the plan where it is not possible to rule out the risk of significant effects on a European site, either alone or in combination with other plans or projects. This provides a clear scope for the parts of the plan that will require appropriate assessment.

Identification of European sites which may be affected by the Plan

3.4 In order to initiate the search of European sites that could potentially be affected by the MWLP, it is established practice in HRAs to consider European sites within the local planning authority area covered by a plan, and also within a buffer distance from the boundary of the plan area.

3.5 A distance of 15km has been used as a starting point to identify European sites likely to be affected by impacts relating

to development in Hertfordshire. In addition to this, consideration has also been given to European sites connected to the plan area beyond this distance, for example through hydrological pathways or emissions from major roads.

3.6 Impacts from development in areas outside of the European site boundaries may also occur where habitat contributes towards maintaining the interest feature for which the European site is designated (known as 'functionally linked land'). This includes land which may provide offsite foraging and roosting habitat for birds.

3.7 Three European sites are within Hertfordshire and could therefore be affected by policies within the MWLP: Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, and Lee Valley SPA and Ramsar site.

3.8 A further three sites are located within 15km of the Hertfordshire boundary:

- Eversden and Wimpole Woods SAC;
- Epping Forest SAC;
- Burnham Beeches SAC;
- South West London Waterbodies SPA/Ramsar.

3.9 The only relevant pathway to European sites beyond 15km that has been identified is hydrological links. Windsor Forest and Great Park SAC and Richmond Park SAC lie just beyond 15km from Hertfordshire but neither these nor other European sites have been identified as being connected to Hertfordshire via waterbodies i.e. rivers and streams.

3.10 The designated features and conservation objectives of the European sites, together with current pressures and potential threats, was established using Data Forms for SACs and SPAs[16] and Information Sheets for Ramsar Wetlands published on the JNCC website[17], as well as Natural England's Site Improvement Plans[18], Supplementary Advice Notes[19] and the most recent conservation objectives published on the Natural England website (most were published in 2014)[20]. This analysis enabled European site interest features to be identified, along with the features of each European site which determine site integrity and the specific sensitivities and threats facing the site. This information was then used to inform an assessment of how the potential impacts of the MWLP may result in likely significant effects on each of the European sites in question, either alone or in-combination.

Functionally linked land

3.11 The term 'functional linkage' can be used to refer to the role or 'function' that land beyond the boundary of a European site might fulfil in terms of supporting the populations for which the site was designated or classified. Such an area is therefore 'linked' to the site in question because it provides a (potentially important) role in maintaining or restoring a protected population at favourable conservation status.

3.12 Whilst the boundary of a European site will usually be drawn to include key supporting habitat for a qualifying species, this cannot always be the case where the population for which a site is designated or classified is particularly mobile. Individuals of the population will not necessarily remain in the site all the time. Sometimes, the mobility of qualifying species is considerable and may extend so far from the key habitat that forms the SAC or SPA that it would be entirely impractical to attempt to designate or classify all of the land or sea that may conceivably be used by the species[21].

3.13 Damage or loss of off-site habitat (i.e. land outside European sites that is functionally linked as it may be used by the qualifying species of a site) is more likely to be an issue for highly mobile species, particularly birds and bats.

3.14 The following European sites within 15km of Hertfordshire support mobile species:

3.15 Invertebrates:

- Chilterns Beechwoods SAC (*Lucanus cervus*, stag beetle).
- Epping Forest SAC (*Lucanus cervus*, stag beetle).

3.16 Bats:

- Eversden and Wimpole Woods SAC (*Barbastella barbastellus*, barbastelle bat).

3.17 Birds:

- Lee Valley SPA/Ramsar (*Botaurus stellaris*, great bittern [SPA only]; *Anas clypeata*, northern shoveler; *Anas strepera*, gadwall).

[16] These were obtained from the Joint Nature Conservation Committee and Natural England websites (www.jncc.gov.uk and www.naturalengland.org.uk)
[17] www.jncc.defra.gov.uk
[18] Natural England is in the process of compiling Site Improvement Plans for all Natura 2000 sites in England as part of the Improvement programme for England's Natura 2000 sites (IPENS).
[19] Supplementary Advice Notes, Natural England, (can be found under the relevant European site's Conservation Objectives): http://publications.naturalengland.org.uk/category/6490068894089216
[20] http://publications.naturalengland.org.uk/category/6490068894089216
[21] CHAPMAN, C. & TYLDESLEY, D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions. Natural England Commissioned Reports, Number 207

- South West London Waterbodies SPA/Ramsar (*Anas clypeata*, northern shoveler; *Anas strepera*, gadwall).

Invertebrates

3.18 The stag beetle is a qualifying feature of the Chiltern Beechwoods and Epping Forest SACs. Stag beetles may travel outside of the SAC boundaries, although it is unlikely that they will travel far (it is generally only the male stag beetle that flies during the summer months, and the female beetle rarely flies)[22]. Research[23] suggests that 2km may be an appropriate buffer inside which sites could be functionally connected, as this is the distance that male stag beetles travel to females during the breeding season. Epping Forest SAC is c.3.5km outside the county boundary; therefore effects on functionally linked land do not need to be screened in for this site.

3.19 Chilterns Beechwoods SAC is partly within Hertfordshire; however, stag beetles have only been recorded within the SAC at Bisham Woods and Hollowhill & Pullingshill Woods. Bisham Woods is c.16km and Hollowhill & Pullingshill Woods is 20km from the county boundary; therefore effects on functionally linked land do not need to be screened in for this site.

Bats

3.20 The qualifying features at Eversden and Wimpole Woods SAC include Barbastelle bats. There is evidence that the home range of Barbastelle bats is 1-20km[24]; however this evidence also states that their core foraging areas are likely to lie within a much smaller range and that 7km is a suitable distance for targeting the protection of foraging habitats. Eversden and Wimpole Woods SAC is c.9.5km from the Hertfordshire boundary at its nearest point. While the home range of individuals may extend into Hertfordshire, their level of dependence on habitats beyond 7km is likely to be low. Effects on functionally linked land do not need to be screened in for this site.

Birds

3.21 Birds have varying ranges depending on the species and therefore need to be considered on a site by site basis. The transient species for which the Lee Valley SPA/Ramsar sites are designated (Bittern, Northern Shoveler and Gadwall) and the South West London Waterbodies SPA/Ramsar sites (Northern Shoveler and Gadwall) predominantly use open water and wetland habitats, although Northern Shoveler and Gadwall occasionally breed away from the water if there is no suitable habitat nearby[25]. As the SPA/Ramsar sites provide a range of habitats, it is likely that only sites with significant wetland habitats, or those very close to the SPA/Ramsar sites or potentially linked sites could support offsite habitats used by the SPA and Ramsar species.

3.22 Parts of the Lee Valley SPA/Ramsar are within Hertfordshire, and the section of the SPA/Ramsar outside the county is c.9km away. South West London Waterbodies SPA/Ramsar is c.14.5km from the Hertfordshire border. Various waterbodies extend north from the SPA/Ramsar, along the River Colne into the south of Hertfordshire. A network of waterbodies extends across Hertfordshire, from near Rickmansworth in the south, to Hertford at the northern end of the Lee Valley SPA/Ramsar, in the west of Hertfordshire. This network is principally associated with the River Colne and River Lea, and former minerals extraction sites in the wider area. These waterbodies have the potential to be functionally-linked to the South West London Waterbodies SPA/Ramsar (or Lee Valley SPA/Ramsar). For example, gadwall have been recorded[26] at Hillfield Reservoir near Watford. However, the distance from South West London Waterbodies SPA/Ramsar is such that, even if individuals from the European site visit waterbodies in Hertfordshire, they are unlikely to be significant to the qualifying bird species.

3.23 Natural England has previously advised that their recognised distance for the consideration of offsite functionally linked habitat is generally 2km; but for certain species (e.g. golden plover and lapwing), a much greater distance of up to 15km may be appropriate. South West London Waterbodies SPA/Ramsar and Lee Valley SPA/Ramsar are designated for wetland bird species; therefore functionally land is considered only likely to be important within close proximity to the European sites. Case law[27] relating to the proposed HS2 railway line also found that Colne Valley SSSI, which is closer to the SPA/Ramsar than Hertfordshire's reservoirs and has a greater diversity of habitats that would attract SPA/Ramsar bird species, found that the likelihood of significant effects on functionally linked habitat was 'very low'. Effects relating to land functionally linked to the South West London Waterbodies SPA/Ramsar therefore do not need to be screened in for this site.

3.24 Effects on land functionally linked to the Lee Valley SPA/Ramsar, however, are screened in as this site lies partly within Hertfordshire. Functionally linked land, if present, is likely to be limited to larger areas of wetland habitat and water

[22] https://www.royalparks.org.uk/parks/richmond-park/richmond-park-attractions/wildlife/stag-beetles
[23] http://onlinelibrary.wiley.com/doi/10.1111/j.1469-7998.2006.00282.x/abstract
[24] http://jmammal.oxfordjournals.org/content/93/4/1110
[25] http://www.birdlife.org/datazone
[26] http://www.hef.org.uk/nature/biodiversity_vision/chapter_05_wetlands.pdf
[27] Buckinghamshire County Council & ORS, R (on the application of) v Secretary of State for Transport (2013), Paragraphs 206-212.

bodies along the River Lea corridor between Waltham Abbey and Ware, ie in close proximity to the SPA/Ramsar.

Summary of European sites screened into HRA

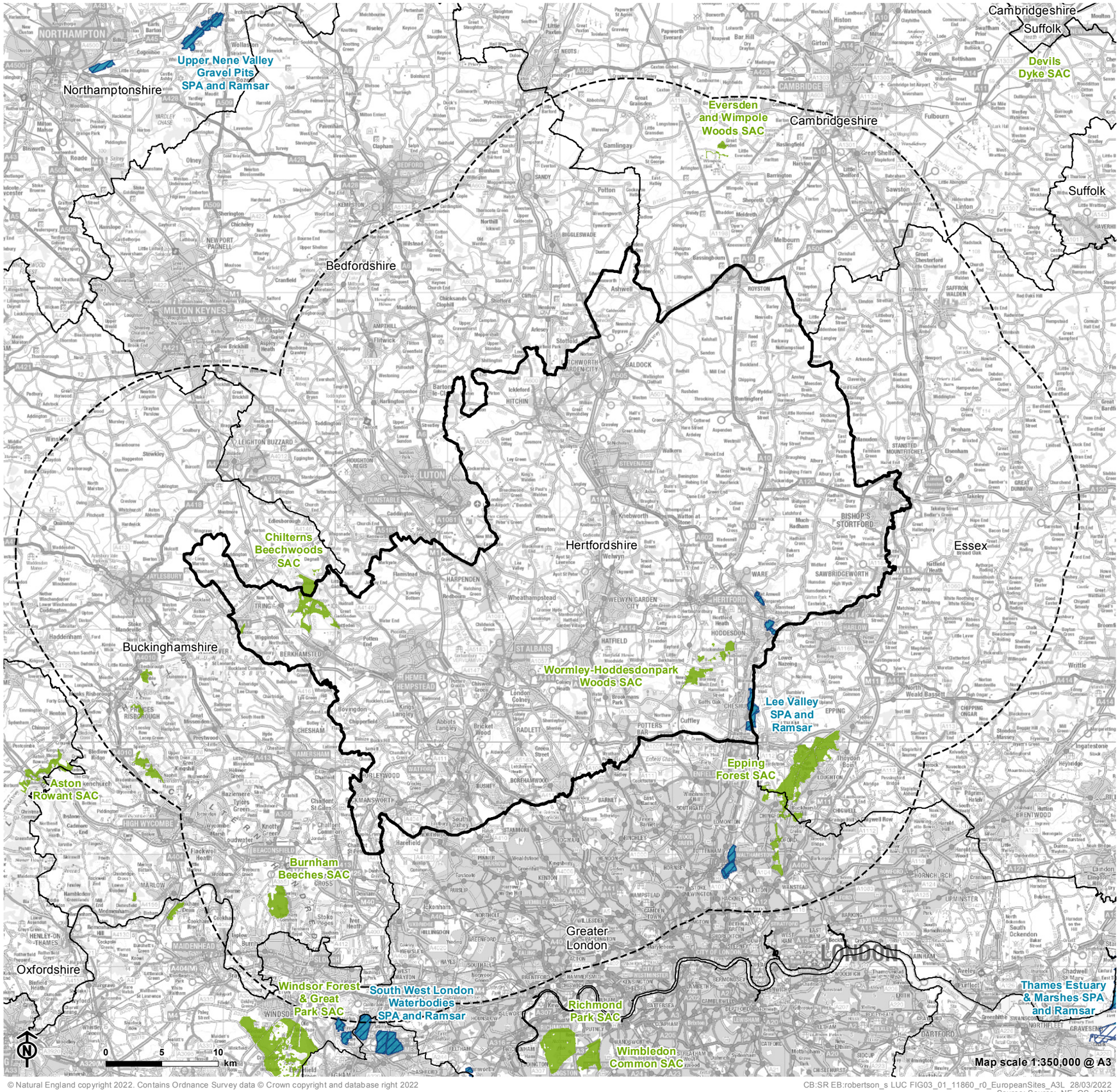
3.25 European sites considered within the HRA are listed below in **Table 3.1** below and **Figure 3.1**. Detailed information about each site is provided in **Appendix B**.

Table 3.1: European sites within 15km of, or otherwise linked to, Hertfordshire

European site	Closest distance and direction from Hertfordshire	Is functionally linked land screened in?
Chilterns Beechwoods SAC	Within borough	No
Wormley Hoddesdonpark Woods SAC	Within borough	No
Lee Valley SPA and Ramsar site	Within borough	Yes
Epping Forest SAC	c.3.6km southeast	No
Burnham Beeches SAC	c.7.7km southwest	No
Eversden and Wimpole Woods SAC	c.10km north	No
South West London Waterbodies SPA/Ramsar	c.14km south	No

LUC

Figure 3.1: Location of European Sites in Relation to the Plan Area



CB:SR EB:robertson_s LUC FIG03_01_11860_r0_EuropeanSites_A3L 28/03/2022
Source: Source: NE, OS, ONS

Assessment of 'Likely Significant Effect'

3.26 As required under Regulation 105 of The Conservation of Habitats and Species Regulations 2017[28] (as amended) (the 'Habitats Regulations'), an assessment has been undertaken of the 'likely significant effects' of the Plan. The assessment has been prepared in order to identify which policies or site allocations would be likely to have a significant effect on European sites.

3.27 Consideration has been given to the potential for the development proposed to result in significant effects associated with:

- Physical loss of/damage to habitat;
- Non-physical disturbance (noise, vibration and light);
- Non-toxic contamination;
- Air pollution;
- Recreation pressure; and
- Changes to hydrology including water quality and quantity.

3.28 A risk-based approach involving the application of the precautionary principle is adopted in the assessment, such that a conclusion of 'no significant effect' has only been reached where it is considered very unlikely, based on current knowledge and the information available, that a proposal in the MWLP would have a significant effect on the integrity of a European site.

Interpretation of 'Likely Significant Effect'

3.29 Relevant case law helps to interpret when effects should be considered as a Likely Significant Effect (LSE), when carrying out HRA of a land use plan.

3.30 In the Waddenzee case[29], the European Court of Justice ruled on the interpretation of Article 6(3) of the Habitats Directive (translated into Reg. 102 in the Habitats Regulations), including that:

3.31 An effect should be considered 'likely', *"if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site"* (para 44). An effect should be considered 'significant', "*if it undermines the conservation objectives"* (para 48). Where a plan or project has an effect on a site *"but is not likely to undermine its conservation objectives, it cannot be considered likely to have a significant effect on the site concerned"* (para 47).

3.32 An opinion delivered to the Court of Justice of the European Union[30] commented that:

> "The requirement that an effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill."

3.33 This opinion (the '*Sweetman*' case) therefore allows for the authorisation of plans and projects whose possible effects, alone or in combination, can be considered 'trivial' or de minimis; referring to such cases as those *"which have no appreciable effect on the site"*. In practice such effects could be screened out as having no Likely Significant Effect; they would be 'insignificant'.

3.34 The HRA screening assessment therefore considers whether the MWLP policies could have likely significant effects either alone or in combination.

In-combination effects

3.35 Regulation 105 of the Habitats Regulations 2017 requires an Appropriate Assessment where *"a land use plan is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is not directly connected with or necessary to the management of the site"*. Therefore, it will be necessary to consider whether any impacts identified from the MWLP may combine with other plans or projects to give rise to significant effects in-combination.

3.36 Where the MWLP is likely to have an effect on its own e.g. due to water pollution (due to impact pathways being present), but it is not likely to be significant, the in-combination assessment at Screening stage needs to determine whether there may also be the same types of effect from other plans or projects that could combine with the MWLP to produce a significant effect. If so, this likely significant effect (e.g. water pollution) arising from the MWLP in combination with other plans or projects, would then need to be considered through the Appropriate Assessment stage to determine if water pollution would have an adverse effect on integrity of the relevant European site. Where the screening assessment has concluded that there is no impact pathway between development proposed in the MWLP and the conditions necessary to maintain qualifying features of a European site,

[28] SI No. 2017/2012
[29] ECJ Case C-127/02 "Waddenzee" Jan 2004.
[30] Advocate General's Opinion to CJEU in Case C-258/11 Sweetman and others v An Bord Pleanala 22nd Nov 2012.

then there will be no in-combination effects to assess at the Screening or Appropriate Assessment stage. This approach accords with recent guidance on HRA in the HRA Handbook[31].

3.37 If impact pathways are found to exist for a particular effect but it is not likely to be significant from the MWLP alone, the in-combination assessment will identify which other plans and programmes could result in the same impact on the same European site. This will focus on planned growth (including housing, employment, transport, minerals and waste) around the affected site, or along the impact corridor, for example, if impacts could arise as a result of changes to a waterway, then planned growth in local authorities along that waterway will be considered.

3.38 The potential for in-combination impacts will therefore focus on plans prepared by local authorities that overlap with European sites that are within the scope of this HRA. The findings of any associated HRA work for those plans will be reviewed where available. Where relevant, any strategic projects in the area that could have in-combination effects with the Local Plan will also be identified and reviewed.

3.39 The online HRA Handbook suggests the following plans and projects may be relevant to consider as part of the in-combination assessment:

- Applications lodged but not yet determined, including refusals subject to an outstanding appeal or legal challenge;
- Projects subject to periodic review e.g. annual licences, during the time that their renewal is under consideration;
- Projects authorised but not yet started'
- Projects started but not yet completed;
- Known projects that do not require external authorisation;
- Proposals in adopted plans;
- Proposals in draft plans formally published or submitted for final consultation, examination or adoption.

3.40 The need for in-combination assessment also arises at the Appropriate Assessment stage, as discussed in the Appropriate Assessment section below.

Screening assessment

3.41 A screening matrix has been prepared (**Appendix B**), which considers the potential for likely significant effects resulting from each policy in the MWLP, and the potential site allocations that may contribute to each type of impact. A 'traffic light' approach has been used in the screening matrix to record the likely impacts of each policy and site allocation on European sites and their qualifying habitats and species, using the colour categories shown below.

Red	There are likely to be significant effects (Appropriate Assessment required).
Amber	There may be significant effects, but this is currently uncertain (Appropriate Assessment required).
Green	There are unlikely to be significant effects (Appropriate Assessment not required).

3.42 The screening assessment is conducted without taking mitigation (e.g. embedded in policy) into account, in accordance with the 'People over Wind' judgment.

3.43 For some types of impacts, the potential for likely significant effects has been determined on a proximity basis, using GIS data to determine the proximity of potential development locations to the European sites that are the subject of the assessment. However, there are many uncertainties associated with using set distances as there are very few standards available as a guide to how far impacts will travel. Therefore, where assumptions have been made, these are set out in **Chapter 4**.

Appropriate Assessment methodology

3.44 Following the screening stage, if likely significant effects on European sites are unable to be ruled out, the plan-making authority is required under Regulation 105 of the Habitats Regulations 2017 to make an 'Appropriate Assessment' of the implications of the plan for European sites, in view of their conservation objectives. EC Guidance[32] states that the Appropriate Assessment should consider the impacts of the plan (either alone or in combination with other projects or plans) on the integrity of European sites with respect to their conservation objectives and to their structure and function.

3.45 Unlike the Screening stage, Appropriate Assessment can take into account mitigation, for example as proposed within Local Plan policies.

[31] The HRA Handbook. David Tyldesley & Associates, a subscription based online guidance document [online] Available at: https://www.dtapublications.co.uk/handbook/European

[32] Assessment of plans and projects significantly affecting European sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission Environment DG, November 2001.

Assessing the effects on site integrity

3.46 A site's integrity depends on it being able to sustain its 'qualifying features' (i.e. the habitats and species for which it has been designated) and to ensure their continued viability. The Holohan judgement also clarifies that the effects on species and habitats not listed as qualifying features, but which could result in secondary effects upon the qualifying features of European sites also need to be considered. The Appropriate Assessment, if required, will refer the information set out in **Appendix B** of this report, to consider the characteristics of supporting habitats and species that could be affected by impacts identified at the screening stage.

3.47 A high degree of integrity at a site is considered to exist where the potential to meet a site's conservation objectives is realised and where the site is capable of self-repair and renewal with a minimum of external management support.

3.48 A conclusion needs to be reached as to whether or not the MWLP would adversely affect the integrity of a European site. Assessing the effects on the site(s) integrity involves considering whether the predicted impacts of the MWLP policies and/or sites (either alone or in combination) have the potential to:

- Cause delays to the achievement of conservation objectives for the site.
- Interrupt progress towards the achievement of conservation objectives for the site.
- Disrupt those factors that help to maintain the favourable conditions of the site.
- Interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site.
- Cause changes to the vital defining aspects (e.g. nutrient balance) that determine how the site functions as a habitat or ecosystem.
- Change the dynamics of relationships that define the structure or function of the site (e.g. relationships between soil and water, or animals and plants).
- Interfere with anticipated natural changes to the site.
- Reduce the extent of key habitats or the population of key species.
- Reduce the diversity of the site.
- Result in disturbance that could affect the population, density or balance between key species.
- Result in fragmentation.
- Result in the loss of key features.[33]

3.49 The conservation objectives for each SAC and SPA (**Appendix B**) are generally to maintain the qualifying features in favourable condition. Natural England does not define conservation objectives for Ramsar sites but these can often be inferred from those for co-located SAC or SPA features. The Site Improvement Plans for each site provide a high level overview of the issues (both current and predicted) affecting the condition of the designated features on the site(s) and outline the priority measures required to improve the condition of the features. An Appropriate Assessment draws on these to help to understand what is needed to maintain the integrity of the European sites.

3.50 For each European site where an uncertain or likely significant effect is identified in relation to the MWLP, the potential impacts will be set out and judgements made (based on the information available) regarding whether the impact will have an adverse effect on the integrity of the site. A further in-combination assessment will need to be carried out for any likely significant effects identified where following Appropriate Assessment it is considered that the MWLP will not on its own adversely affect the integrity of the European site. This will be undertaken in the same way as described above under the Screening stage drawing on information regarding the same types of relevant plans or projects referred to above. Consideration will be given to the potential for mitigation measures to be implemented that could reduce the likelihood or severity of the potential impacts such that there would not be an adverse effect on the integrity of the site.

[33] Ibid.

Chapter 4
HRA Screening

Screening conclusions and whether Appropriate Assessment is required

4.1 The HRA screening of the MWLP has determined that Appropriate Assessment is required, as likely significant effects from the plan's policies cannot be ruled out through screening. The reasoning for this is presented below.

4.2 **Appendix B** sets out the screening of each policy in the MWLP, and this chapter summarises the findings of that process.

Physical damage and loss of habitat

4.3 Any development resulting from the MWLP would be located within Hertfordshire; therefore, only those European sites within (or with functionally linked land within) the Hertfordshire boundary could be affected by direct physical damage or loss of habitat within the site boundaries. The sites within the county boundary are:

- Chilterns Beechwoods SAC.
- Wormley Hoddesdonpark Woods SAC.
- Lee Valley SPA/Ramsar (and functionally linked land, if present within the county).

4.4 The following policies could result in development within a European sites or within water bodies or wetland habitat between Waltham Abbey and Ware (ie land potentially functionally linked to Lee Valley SPA/Ramsar):

- Policy 5: Mineral Safeguarding Areas (MSAs) – could require non-minerals development to extract minerals within MSAs. MSAs identified within Wormley Hoddesdonpark Woods SAC (sand and gravel MSA), Chilterns Beechwoods SAC (brick clay MSA), Lee Valley SPA/Ramsar (sand and gravel MSA), and parts of waterbodies that may be functionally linked to Lee Valley SPA/Ramsar (sand and gravel MSA).
- Policy 22: Water Recycling Sites – permits new/extended water recycling infrastructure within Lee Valley SPA/Ramsar (Rye Meads sewage treatment works, within Rye Meads SSSI).

4.5 In theory, development could also be permitted within these sites under the following policies, which permit development outside of specific locations:

- Policy 2: Meeting Sand and Gravel Needs (only likely within areas of known sand and gravel resource, indicated by the Minerals Safeguarding Area for sand and gravel);
- Policy 6: Brick Clay (only likely within areas of known brick clay resource, indicated by the Minerals Safeguarding Area for brick clay);
- Policy 7: Chalk;
- Policy 8: Borrow Pits;
- Policy 9: Incidental Mineral Extraction;
- Policy 10: Secondary and Recycled Materials;
- Policy 12: Landfill Excavation;
- Policy 22: Water Recycling Sites; and
- Policy 23: Transport Infrastructure Sites.

4.6 There is potential for likely significant effects to occur in relation to physical damage and loss of habitat at Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, and Lee Valley SPA/Ramsar (or its functionally linked land), which therefore requires further consideration at Appropriate Assessment.

Non-physical disturbance

4.7 Noise and vibration effects, e.g. during the construction or operation of minerals or waste development, are most likely to disturb bird species and are thus a key consideration with respect to European sites where birds are the qualifying features. Artificial light at night (e.g. from street lamps, flood lighting and security lights) has the potential to affect species where it occurs in close proximity to key habitat areas, such as key roosting sites of SPA birds.

4.8 The effects of noise, vibration and light are most likely to be significant if waste and mineral development takes place within 500m of a European site with qualifying features sensitive to these disturbances, or mapped off-site breeding, foraging or roosting areas. This is the distance that, in our experience, provides a robust assessment of effects and meets with the agreement of Natural England.

4.9 Of the European sites within the county or within 500m of its boundary, only the following site has qualifying features with the potential to be affected by noise, vibration or lighting:

- Lee Valley SPA/Ramsar (*Botaurus stellaris*, great bittern [SPA only); *Anas clypeata*, shoveler; *Anas strepera*, gadwall; *Micronecta minutissima*, a water-boatman [Ramsar only]).

4.10 Functionally linked land associated with this site could also be affected by non-physical disturbance.

4.11 The following policies specify potential locations for development that are within 500m of the Lee Valley SPA/Ramsar or within water bodies or wetland habitat between Waltham Abbey and Ware (ie land potentially functionally linked to Lee Valley SPA/Ramsar):

- Policy 2: Meeting Sand and Gravel Needs – MAS01 The Briggens Estate is c.800m from the Lee Valley SPA/Ramsar, but c.400m from a lake that lies adjacent to the River Lea (potentially functionally linked land).
- Policy 3: Meeting Waste Management Needs - Waste Management Sites and allocated employment within 500m of Lee Valley SPA/Ramsar or land that may be functionally linked land. Two sites (Robert Gibbs Contracting and Ratty's Lane) are within 500m of the SPA/Ramsar. One site (Stephenson Close Waste Paper Recycling) is also within 500m of a lake close to the River Lea (potentially functionally linked).
- Policy 5: Mineral Safeguarding Areas (MSAs) – could require non-minerals development to extract minerals within MSAs (sand and gravel MSAs within Lee Valley SPA/Ramsar and land that may be functionally linked).
- Policy 22: Water Recycling Sites – permits new/extended water recycling infrastructure within Lee Valley SPA/Ramsar (Rye Meads sewage treatment works, within Rye Meads SSSI).
- Policy 23: Transport Infrastructure Sites – one site (Rye House Rail Aggregates Depot) within 500m of Lee Valley SPA/Ramsar.

4.12 The following policies could also result in development within 500m of the Lee Valley SPA/Ramsar, as they do not specify potential development locations:

- Policy 2: Meeting Sand and Gravel Needs (only likely within areas of known sand and gravel resource, indicated by the Minerals Safeguarding Area for sand and gravel);
- Policy 7: Chalk;
- Policy 8: Borrow Pits;
- Policy 9: Incidental Mineral Extraction;
- Policy 10: Secondary and Recycled Materials;
- Policy 12: Landfill Excavation;
- Policy 22: Water Recycling Sites: and

- Policy 23: Transport Infrastructure Sites.

4.13 There is potential for likely significant effects to occur in relation to non-physical disturbance at Lee Valley SPA/Ramsar (or its functionally linked land), which therefore requires further consideration at Appropriate Assessment.

Air pollution

4.14 Air pollution is most likely to affect European sites where plant, soil and water habitats are the qualifying features, but some qualifying animal species may also be affected, either directly or indirectly, by deterioration in habitat as a result of air pollution. Deposition of pollutants to the ground and vegetation can alter the characteristics of the soil, affecting the pH and nitrogen levels, which can then affect plant health, productivity and species composition.

4.15 New waste development arising from the MWLP may result in air pollution caused by dust, industrial emissions and/or vehicle emissions.

Vehicle emissions

4.16 In terms of vehicle traffic, nitrogen oxides (NOx, i.e. NO and NO_2) are considered to be the key pollutants. Deposition of nitrogen compounds may lead to both soil and freshwater acidification, and NOx can cause eutrophication of soils and water. Screening criteria used to determine whether vehicle emissions could have a likely significant effect on a European site are based on:

- The sensitivity of a European site to air pollution;
- Proximity to a major road; and
- The increase in traffic on that road, due to the Plan.

4.17 Air pollution from traffic is most likely to affect European sites that have plant, soil and water habitats amongst their qualifying features but some qualifying animal species may also be indirectly affected by deterioration in habitat. Therefore, where European sites do not include species that are vulnerable to these impacts amongst their qualifying features, air pollution-related effects can be ruled out. Consideration has been given to the qualifying features of the European sites and whether they are vulnerable to increased air pollution. APIS data has also been used to identify where levels of pollutants are already exceeding critical loads at the relevant European sites.

4.18 The most acute impacts of NOx take place close to where they are emitted, but individual sources of pollution will also contribute to an increase in the general background levels of pollutants at a wider scale, as small amounts of NOx and other pollutants from the pollution source are dispersed more widely by the prevailing winds.

4.19 Based on the National Highways Design Manual for Road and Bridges[34] (DMRB) Document LA105: Air Quality (which was produced to provide advice regarding the design, assessment and operation of trunk roads (including motorways)), it is assumed that air pollution from roads is unlikely to be significant beyond 200m from the road itself. Where increases in traffic volumes are forecast, this 200m buffer needs to be applied to the relevant roads in order to make a judgement about the likely geographical extent of air pollution impacts.

4.20 The DMRB Guidance for the assessment of local air quality in relation to highways developments provides criteria that should be applied to ascertain whether there are likely to be significant impacts associated with routes or corridors. Based on the DMRB guidance, affected roads that should be assessed are those where:

- Daily traffic flows will change by 1,000 AADT (Annual Average Daily Traffic) or more; or
- Heavy duty vehicle[35] (HDV) flows will change by 200 AADT or more; or
- A change in speed band; or
- Road alignment will change by 5 m or more.

4.21 In order to assess whether a Plan could have likely significant effects, the 1,000 AADT screening criteria is applied both to the traffic flows from the Plan alone, and in combination with background traffic growth and other relevant committed developments. Professional judgement is required to determine the scope of an in-combination assessment, to ensure that the assessment is proportionate and identifies effects that are *likely* and *significant*. LUC has been advised[36] that it is appropriate to use a screening distance of 10km from a Plan boundary, to identify European sites that could be significantly affected by air pollution arising from traffic associated with a development Plan.

4.22 Minerals and Waste management facilities could generate HDV traffic that includes both HGVs and smaller types of HDVs, with a smaller proportion of trips from non-HDV traffic (for example by employees). Household waste

[34] https://www.standardsforhighways.co.uk/prod/attachments/10191621-07df-44a3-892e-c1d5c7a28d90

[35] Defra defines Heavy Duty Vehicles (HDVs) as road vehicles greater than 3.5 tonnes gross weight and Heavy Goods Vehicles (HGVs) as road vehicles greater than 7.5 tonnes gross weight (https://uk-air.defra.gov.uk/assets/documents/reports/aqeg/nd-glossaryapp.pdf)

[36] DTA Ecology Habitats Regulations Masterclass: dealing with air pollution; May 2021

facilities would also generate non-HDV traffic from employees and users of the facility.

4.23 The sensitivity of the European sites to changes in air quality and the major roads (motorways or 'A' roads) within 200m of them are listed in **Table 4.1**. The location of the European sites in relation to major roads is shown on **Figure 4.1**.

Table 4.1: European sites, roads within 200m and HRA screening

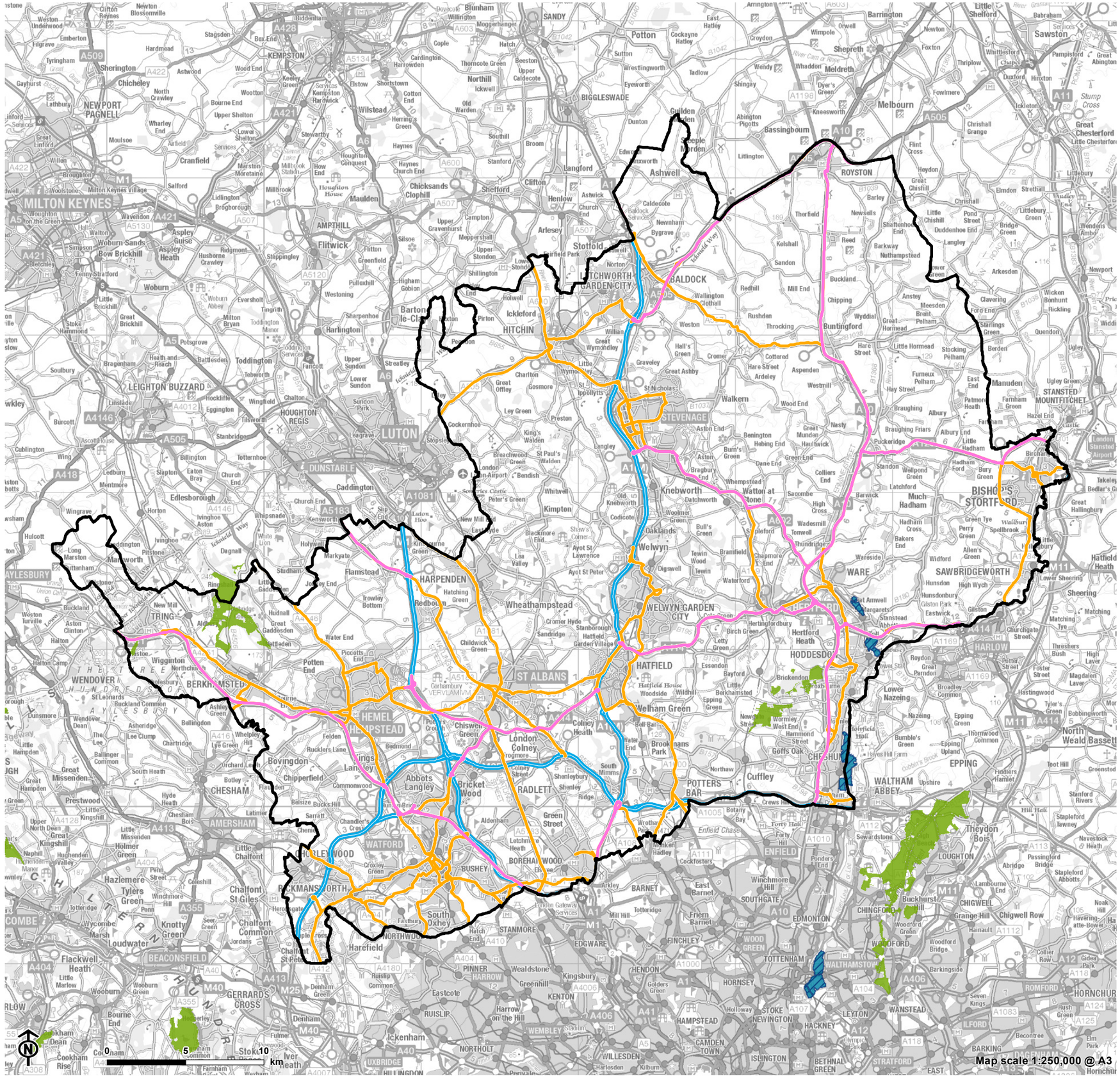
European sites	Motorway/A roads within 200m	Notes
Screened in		
Wormley Hoddesdonpark Woods SAC	A10 (within Hertfordshire)	Air pollution (atmospheric nitrogen deposition) is identified as a pressure affecting the site's woodland habitats[37].
Chiltern Beechwoods SAC	A41 (within Hertfordshire) A308, A404 and A4010 (outside Hertfordshire)	Air pollution (atmospheric nitrogen deposition) is identified as a pressure affecting the site's grassland and woodland habitats, and stag beetles[38] (although stag beetles are not considered to be highly susceptible to air pollution).
Lee Valley SPA and Ramsar	A414 (within Hertfordshire) A503 and A1055 (outside Hertfordshire)	Air pollution (atmospheric nitrogen deposition) is identified as a threat affecting bittern[39]. Effects on functionally-linked land may be an issue, in relation to bittern. The SPA/Ramsar has other species that use functionally linked land (gadwall and shoveler), but these have not been identified as sensitive to air pollution at this site.
Epping Forest SAC	A121 (the section of this road that is within 200m of the European site is outside the county boundary however, the A121 passes within Hertfordshire) M25, A1009, A104, A1069, A110, A112, A113, A114, A1199, A12, A406, A503 (outside Hertfordshire)	Air pollution (atmospheric nitrogen deposition) is the greatest threat affecting the site's woodland and heath habitats[40].
Screened out		
Burnham Beeches SAC	A355 (outside Hertfordshire)	Although the A355 passes within 200m of Burnham Beeches SAC, it is unlikely that traffic from waste or minerals development in Hertfordshire, using the primary route network and motorways, would pass this SAC, as the A355 runs parallel to and outside the county boundary. No impact pathway.
Eversden and Wimpole Woods SAC	None	No impact pathway.

[37] Wormley Hoddesdonpark Woods SAC Site Improvement Plan: http://publications.naturalengland.org.uk/publication/6314181103976448
[38] Chilterns Beechwoods SAC Site Improvement Plan: http://publications.naturalengland.org.uk/publication/6228755680854016
[39] Lee Valley SPA Site Improvement Plan: http://publications.naturalengland.org.uk/publication/5864999960444928
[40] Epping Forest SAC Site Improvement Plan: http://publications.naturalengland.org.uk/publication/6663446854631424

European sites	Motorway/A roads within 200m	Notes
South West London Waterbodies SPA and Ramsar	M25 (the section of this road that is within 200m of the European site is outside the county boundary however, the M25 passes within Hertfordshire) A30, A3044 (outside Hertfordshire)	Air pollution is not identified as a threat or pressure at the SAC;[41] however supporting habitats for gadwall, within the SPA/Ramsar, may be sensitive[42]. Site is >10km from Hertfordshire; therefore no likely significant effects.

[41] South West London Waterbodies SPA Site Improvement Plan: http://publications.naturalengland.org.uk/publication/6662064386867200
[42] South West London Waterbodies SPA Supplementary Advice on Conserving and Restoring Site Features: http://publications.naturalengland.org.uk/publication/4901473695563776

Figure 4.1: Major roads and European sites



CB:SR EB:robertson_s LUC FIG04_01_11860_r0_MajorRoads_EuropeanSites _A3L 28/03/2022
Source: Source: NE, OS, ONS

4.24 The following policies could result in development that increases traffic:

- Policy 2: Meeting Sand and Gravel Needs;
- Policy 3: Meeting Waste Management Needs;
- Policy 5: Mineral Safeguarding Areas;
- Policy 6: Brick Clay;
- Policy 7: Chalk;
- Policy 8: Borrow Pits;
- Policy 9: Incidental Mineral Extraction;
- Policy 10: Secondary and Recycled Materials;
- Policy 12: Landfill Excavation;
- Policy 22: Water Recycling Sites; and
- Policy 23: Transport Infrastructure Sites.

4.25 At this stage, there is insufficient information on traffic flows to determine whether any individual waste or minerals sites (and the related policies) could result in increases that exceed the DMRB screening criteria. However, there is the potential for the screening criteria to be exceeded by the sites/policies in combination with each other, or with other plans or projects.

4.26 There is potential for likely significant effects to occur in relation to vehicle emissions at Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, Lee Valley SPA/Ramsar (and its functionally linked land), Epping Forest SAC, or South West London Waterbodies SPA/Ramsar, which therefore requires further consideration at Appropriate Assessment.

Dust

4.27 There may be some fugitive dust released from outdoor operations. Large particles will mostly deposit close to the source and the assumption is that the vast majority of dust deposition would occur within 100m, although some smaller particles may travel up to 200-500m.[43] Therefore, significant effects on European sites from dust are unlikely beyond 100m.

4.28 The following European sites are within the county (no additional sites are within 100m of the county boundary) and have habitats that may be sensitive to dust deposition and therefore could be affected by minerals and waste development within Hertfordshire:

- Chilterns Beechwoods SAC;
- Wormley Hoddesdonpark Woods SAC; and
- Lee Valley SPA / Ramsar (and functionally linked land, if present within the county).

4.29 The following policies specify potential locations for development that are within 100m of Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, or Lee Valley SPA/Ramsar (or land potentially functionally linked to it):

- Policy 5: Mineral Safeguarding Areas (MSAs) – could require non-minerals development to extract minerals within MSAs: sand and gravel MSAs within Lee Valley SPA/Ramsar and land that may be functionally linked; brick clay MSA within 100m of Chilterns Beechwoods SAC; sand and gravel MSA within 100m of Wormley Hoddesdonpark Woods SAC.
- Policy 22: Water Recycling Sites – permits new/extended water recycling infrastructure within Lee Valley SPA/Ramsar (Rye Meads sewage treatment works).

4.30 The following policies could also result in development within 100m of one of the three European sites in the county, as they do not specify potential development locations:

- Policy 2: Meeting Sand and Gravel Needs (only likely within areas of known sand and gravel resource, indicated by the Minerals Safeguarding Area for sand and gravel; ie only within 100m of Wormley Hoddesdonpark Woods SAC or Lee Valley SPA/Ramsar and functionally linked land);
- Policy 6: Brick Clay (only likely within areas of known brick clay resource, indicated by the Minerals Safeguarding Area for brick clay; ie only within 100m of Chilterns Beechwoods SAC);
- Policy 7: Chalk;
- Policy 8: Borrow Pits;
- Policy 9: Incidental Mineral Extraction;
- Policy 10: Secondary and Recycled Materials;
- Policy 12: Landfill Excavation;
- Policy 22: Water Recycling Sites: and
- Policy 23: Transport Infrastructure Sites.

4.31 There is potential for likely significant effects to occur in relation to dust at Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, and Lee Valley SPA/Ramsar (and its functionally linked land), which

[43] As referenced in the Institute of Air Quality Management guidance Guidance on the Assessment of Mineral Dust Impacts for Planning (2016), https://iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

therefore requires further consideration at Appropriate Assessment.

Industrial emissions

4.32 Industrial emissions may arise from processes such as energy from waste, which can produce air pollutants that include acid gases, particulates, dioxins and heavy metals.

4.33 The area over which industrial emissions can have an adverse effect depends on the nature of the emissions and factors such as stack height and topography of the surrounding area.

4.34 Environment Agency guidance on environmental permitting[44] uses a distance of 10km to screen the potential for effects on European sites from industrial emissions. European sites within 10km of the Hertfordshire boundary that are sensitive to air pollution are:

- Chilterns Beechwoods SAC;
- Wormley Hoddesdonpark Woods SAC;
- Lee Valley SPA / Ramsar (and functionally linked land, if present within the county);
- Epping Forest SAC;
- Burnham Beeches SAC; and
- Eversden and Wimpole Woods SAC.

4.35 Policy 3: Meeting Waste Management Needs permits waste development that could give rise to industrial emissions, for example from Energy from Waste facilities. As set out in Policy 3, waste development would only be permitted within waste management sites, or existing/allocated employment land. These occur throughout the borough and within 10km of all the European sites listed above (although Burnham Beeches SAC and Eversden and Wimpole Woods SAC are on the edge of the 10km distance). Therefore industrial emissions could in theory affect any of these European sites.

4.36 There is potential for likely significant effects to occur in relation to industrial emissions at Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, Lee Valley SPA/Ramsar (including its functionally linked land), Epping Forest SAC, Burnham Beeches SAC or Eversden & Wimpole Woods SAC, which therefore requires further consideration at Appropriate Assessment.

Recreation pressure

4.37 Recreational activities and human presence can result in significant effects on European sites as a result of erosion and trampling, associated impacts such as fire and vandalism or disturbance to sensitive features, such as birds through both terrestrial and water-based forms of recreation.

4.38 Recreation is associated with primarily with new housing development and not waste or minerals development.

4.39 Recreation pressure has been screened out of this assessment as there is no potential impact pathway.

Introduced species

4.40 There are potential vermin or pest impacts where waste is managed in the open air, for example composting. However, it is assumed that impacts from waste facilities would not be significant unless the potential waste site extends within the boundary of a European site, or would affect off-site habitats that sustain the site.

4.41 There are no Waste Management Site within any of the European sites.

4.42 Effects relating to introduced species have been screened out as there is no impact pathway.

Water quantity and quality

4.43 Water pollution or contamination of surface and ground watercourses (and therefore soil) could potentially occur as a result of discharge of dewatering, washdown waters and liquids, leachate and scrubber water from waste or minerals facilities. Furthermore, runoff from waste or minerals sites or roads made muddy by associated vehicles may also affect water quality and turbidity.

4.44 Changes in hydrology (e.g. changes to water levels due to abstraction for washing, scrubbing, cooling; or surface or ground water velocity due to increases in hardstanding areas and subsequent increases in runoff) can occur from the development of waste facilities.

4.45 Impacts on water quantity and quality are most likely to affect European sites that are hydrologically connected to the locations where waste development could occur, either via surface or groundwater pathways.

4.46 European sites likely to be affected by changes to water quantity or quality are those with qualifying features that are water bodies, wetland habitats or are species dependent on water bodies and wetland habitats, or habitats sensitive to

[44] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas

changes to the water table, as identified in the Site Improvement Plans or conservation objectives supplementary advice.

4.47 Qualifying features at the following sites have the potential to be affected by changes to water quantity or quality:

- Lee Valley SPA/Ramsar (water habitats and water dependent species), including functionally linked land, if present;
- Epping Forest SAC (wetland habitat); and
- South West London Waterbodies SAC (wetland habitat and water-dependent species).

4.48 The Site Improvement Plan for the Lee Valley SPA identifies water pollution as the greatest threat or pressure affecting the site, followed by hydrological changes. Lee Valley SPA/Ramsar is hydrologically connected to watercourses along the southeast boundary of Hertfordshire, which flow from both rural and urban areas into the River Lea and waterbodies along its course.

4.49 Epping Forest SAC's Site Improvement Plan identifies water pollution and inappropriate water levels as two key issues affecting the European site. However, Epping Forest SAC lies to the east of both the Lee Valley SPA/Ramsar and the Hertfordshire boundary, and no watercourses flow from Hertfordshire to the SAC[45]. Water quality or quantity at Epping Forest SAC is therefore unlikely to be affected by waste or minerals development in Hertfordshire, has been screened out as there is no impact pathway.

4.50 Changes in water quality/quantity are not identified as a threat or pressure at South West London Waterbodies SPA/Ramsar, but the supplementary advice on conservation objectives[46] for the site does set targets for maintaining the extent of open water habitat and water quality (to a standard that supports the qualifying features). South West London Waterbodies SPA/Ramsar is located to the south of Hertfordshire and the River Colne flows south from Hertfordshire towards the River Thames, passing the SPA/Ramsar. Therefore, there is hydrological connectivity between the MWLP area and the European site. However, due to the distance from the Plan area and the dilution that would occur, it is considered unlikely that waste or minerals development in Hertfordshire could affect the extent of open water habitat at the SPA/Ramsar, or significantly affect water quality such that Gadwall and Northern Shoveler can no longer be supported. This site is screened out as there are not likely to be significant effects associated with water quality/quantity.

4.51 At the other European sites within 15km of Hertfordshire, changes in water quality or quantity are not identified as a threat or pressure within the Site Improvement Plans. However, within the supplementary advice for conservation objectives, hydrology or the presence of waterbodies are identified as supporting processes important to the qualifying features:

- Eversden and Wimpole Woods SAC: the site's barbastelle bats make use of ponds and wetlands for feeding; however these are mainly to the north of the SAC[47] and no hydrological connectivity to Hertfordshire has been identified. This site has been screened out as there is no impact pathway.
- Burnham Beeches SAC: hydrology is identified as an important supporting process[48], however it is considered that only development close to the site that disrupts or abstracts from a watercourse or groundwater close to the site could affect the site's hydrology. Burnham Beeches SAC is not in Hertfordshire or connected via surface water. This site has been screened out as there is no impact pathway.
- Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, similarly, could be affected by development that disrupts or abstracts from groundwater close to the site. One waste management site is close to Wormley Hoddesdonpark Woods SAC (A H Nicholls and Sons) and both SACs are partly within Minerals Safeguarding Areas; therefore they will be considered further.

4.52 The following policies could result in development that results in changes to water quality or quantity at Lee Valley SPA/Ramsar, South West London Waterbodies SPA/Ramsar, Wormley Hoddesdonpark Woods SAC, or Chilterns Beechwoods SAC:

- Policy 2: Meeting Sand and Gravel Needs: MAS1 The Briggens Estate is close to Lee Valley SPA/Ramsar;
- Policy 3: Meeting Waste Management Needs: one Waste Management Site is close to Wormley

[45] Environment Agency's Main River Map: https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

[46] http://publications.naturalengland.org.uk/publication/4901473695563776

[47] Eversden and Wimpole Woods SAC Conservation Objectives supplementary advice (2019), http://publications.naturalengland.org.uk/publication/6736081810620416

[48] Burnham Beeches SAC Conservation Objectives Supplementary Advice (2017), http://publications.naturalengland.org.uk/publication/6014456282742784

Hoddesdonpark Woods SAC; several Waste Management Sites and employment sites are close to Lee Valley SPA/Ramsar and the River Colne (>14km north of South West London Waterbodies SPA/Ramsar);

- Policy 5: Mineral Safeguarding Areas: Lee Valley SPA/Ramsar and Wormley Hoddesdonpark Woods SAC are partly within sand and gravel MSAs. Chilterns Beechwoods SAC is partly within the brick clay MSA.
- Policy 6: Brick Clay: MSA partly within Chilterns Beechwoods SAC;
- Policy 7: Chalk: no specific location;
- Policy 8: Borrow Pits: no specific location;
- Policy 9: Incidental Mineral Extraction: no specific location, but likely to be within MSAs; and
- Policy 22: Water Recycling Sites: Rye Meads sewage treatment works, within Lee Valley SPA/Ramsar; and Maple Lodge sewage treatment works (on the River Colne, >14km north of) South West London Waterbodies SPA/Ramsar.

4.53 There is potential for likely significant effects to occur in relation to water quantity or quality at Lee Valley SPA/Ramsar (or its functionally linked land), Wormley Hoddesdonpark Woods SAC, or Chilterns Beechwoods SAC, which therefore requires further consideration at Appropriate Assessment.

Screening conclusion

4.54 Appropriate Assessment is required as some likely significant effects from the MWLP, alone or in combination with other projects or plans, cannot be ruled out without further assessment.

4.55 The scope of the Appropriate Assessment has been narrowed down by considering each policy in turn, to determine whether it would result in the type of development that could have an effect on a European site; this is set out in **Appendix B**. The policies for which likely significant effects have not been ruled out are summarised in **Table 4.2**.

4.56 Table 4.3 summarises the Screening conclusions reached in this HRA, in relation to impact type and European site. The following categories are used:

- Screened out – due to distance thresholds/lack of sensitivities of qualifying features as discussed in this chapter.
- No LSE – as impact of MWLP unlikely to be significant on its own or in combination.
- Potential LSE – as MWLP is considered likely to have significant effect alone (or in combination).

4.57 Impact types for which a conclusion of 'Potential LSE' was reached are considered in more detail at the Appropriate Assessment stage in **Chapter 5**.

Table 4.2: Policies giving rise to the need for Appropriate Assessment of the MWLP

Plan Policy	Will the proposal have likely significant effects (LSEs)? Where LSEs cannot be ruled out, Appropriate Assessment is required
Policy 2: Meeting Sand and Gravel Needs	Uncertain – This policy sets out where sand and gravel development may take place (allocated sites, plus locations outside these, where required) and sets out the overall volume of aggregates required to be extracted. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 3: Meeting Waste Management Needs	Uncertain – This policy sets out where waste development may take place and provides an indication of the overall quantum of waste treatment required. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site.
Policy 10: Secondary and Recycled Materials	Uncertain – this policy permits new processing/distribution facilities, at any 'appropriate' location. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 6: Brick Clay	Uncertain – this policy permits new brick clay workings, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 7: Chalk	Uncertain – this policy permits new chalk extraction, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 8: Borrow Pits	Uncertain – this policy permits borrow pits, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 9: Incidental Mineral Extraction	Uncertain – this policy permits incidental mineral extraction (e.g. while developing a site for other purposes, which could include reservoir creation), with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.

Plan Policy	Will the proposal have likely significant effects (LSEs)? Where LSEs cannot be ruled out, Appropriate Assessment is required
Policy 12: Landfill Excavation	Uncertain – this policy permits the excavation and re-restoration of historic landfill sites, with no locations specified (albeit limited to historic landfills). This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 22: Water Recycling Sites	Uncertain – this policy permits new water recycling sites, which are likely to be close to water courses. Water will need to be treated prior to discharge, but there may be a residual risk of water pollution. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 23: Transport Infrastructure Sites	Uncertain – this policy permits infrastructure required for the sustainable transport of minerals and waste, within Transport Infrastructure Sites (TIS). This policy is therefore intended to reduce the adverse effects of transport (e.g. air pollution), but may alter traffic flows such that air pollution increases in some areas. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.

Table 4.3: Summary of screening assessment

European site	Physical damage/ loss	Non-physical disturbance	Air pollution – vehicle emissions	Air pollution - dust	Air pollution – industrial emissions	Recreation pressure	Introduced species	Water quantity and quality
Chilterns Beechwoods SAC	Potential LSE	Screened out	Potential LSE	Potential LSE	Potential LSE	Screened out	Screened out	Potential LSE
Wormley Hoddesdonpark Woods SAC	Potential LSE	Screened out	Potential LSE	Potential LSE	Potential LSE	Screened out	Screened out	Potential LSE
Lee Valley SPA and Ramsar site (and its functionally linked land)	Potential LSE	Potential LSE	Potential LSE	Potential LSE	Potential LSE	Screened out	Screened out	Potential LSE
Epping Forest SAC	Screened out	Screened out	Potential LSE	Screened out	Potential LSE	Screened out	Screened out	Screened out
Burnham Beeches SAC	Screened out	Screened out	No LSE	Screened out	Potential LSE	Screened out	Screened out	Screened out

European site	Physical damage/ loss	Non-physical disturbance	Air pollution – vehicle emissions	Air pollution - dust	Air pollution – industrial emissions	Recreation pressure	Introduced species	Water quantity and quality
Eversden and Wimpole Woods SAC	Screened out	Screened out	Screened out	Screened out	Potential LSE	Screened out	Screened out	Screened out
South West London Waterbodies SPA/Ramsar	Screened out	Screened out	No LSE	Screened out	Screened out	Screened out	Screened out	No LSE

Chapter 5
Appropriate Assessment

Assessment of whether there will be adverse effects on the integrity of European sites

5.1 The HRA screening has identified the need for Appropriate Assessment, as certain likely significant effects from the MWLP (alone or in combination with other projects or plans) cannot be ruled out without further assessment or information.

5.2 For each type of impact that has been identified as having a likely significant effect, the Appropriate Assessment considers the scale and likely impacts on each of the European sites, the elements of the MWLP (and other plans or projects, where relevant) that would have those effects, and any mitigation or safeguards in place that would reduce the effects. The assessment then considers whether there would be an adverse effect on the integrity of a European site.

5.3 The Appropriate Assessment assesses the MWLP, using currently available information. Where there is insufficient information to undertake quantitative assessment, the HRA identifies the information that will be required to do so (see also **Chapter 6**).

5.4 The following policies in the MWLP, and the development locations associated with them, will result in the type of development or activities that could affect European sites (see **Table 4.2:**

- Policy 2: Meeting Sand and Gravel Needs;
- Policy 3: Meeting Waste Management Needs;
- Policy 10: Secondary and Recycled Materials;
- Policy 6: Brick Clay;
- Policy 7: Chalk;
- Policy 8: Borrow Pits;
- Policy 9: Incidental Mineral Extraction;
- Policy 12: Landfill Excavation;
- Policy 22: Water Recycling Sites; and
- Policy 23: Transport Infrastructure Sites.

5.5 The likely significant effects identified for these policies and development locations have been subject to an Appropriate Assessment below to determine whether they could have an adverse effect on integrity of the relevant European sites identified in **Chapter 3.**

Physical damage and loss of habitat

5.6 The HRA screening (Chapter 4) identified the potential for physical damage and loss of habitat, arising from development that could occur within Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC, or Lee Valley SPA/Ramsar (or its functionally linked land).

5.7 Policy 15: Biodiversity and Geodiversity states that:

> Sites which benefit from designation at an International and European Level, including Ramsar sites, SPAs and SACs, will be afforded the highest level of protection. Development proposals that are likely to have an adverse effect on the integrity of such sites will not be permitted unless exceptional circumstances can be clearly demonstrated.
>
> …
>
> All proposals for minerals and waste management development must clearly demonstrate that throughout the lifetime of the development (including restoration where applicable):
>
> d) the impact on biodiversity through loss of or damage to habitats and/or species is minimised;
>
> …
>
> All proposals for new, and extensions to existing minerals and waste management development, must submit an ecological survey of the site, prepared by a suitably qualified professional, prior to development taking place…

5.8 This policy therefore means that the development within European sites would be discouraged and, where it is proposed, would be required to demonstrate (through project HRA) that there would be no adverse effects on the integrity of those sites (unless 'exceptional circumstances' as defined in the Habitats Regulations were demonstrated).

5.9 The requirement for all proposals to submit an ecological survey prepared by a suitably qualified professional would mean that, if present, functionally linked habitats would be identified. Reference could be made within the supporting text of Policy 15 to the potential for functionally linked land, where the types of impacts are identified, to provide additional guidance. Suggested wording is provided in Chapter 6.

5.10 Policy 21: Water Management provides additional safeguards for proposals within or close to water bodies (ie the Lee Valley SPA/Ramsar or its functionally linked land). The policy states that proposals will be supported where it is demonstrated that there are no unacceptable adverse impacts to the water environment, including the flow and quality of surface water and groundwater. Proposals must demonstrate that they conserve and enhance the water environment.

5.11 These policies are considered sufficient to prevent development from occurring within a European site or its functionally linked land, that would have an adverse effect on the integrity of the European site.

5.12 It is possible to conclude that the MWLP would not have an adverse effect on the integrity of any European sites due to physical damage or loss of habitat, alone or in-combination with other plans and projects.

Non-physical disturbance

5.13 The HRA screening (Chapter 4) identified the potential for non-physical disturbance, arising from development within 500m of Lee Valley SPA/Ramsar (or its functionally linked land).

5.14 As with physical damage and loss of habitat (see above), Policy 15: Biodiversity and Geodiversity provides general protection for European sites and Policy 21 provides safeguards for development close to water bodies.

5.15 Policy 19: Protection and Enhancement of Amenity provides additional safeguards. The policy outlines that development proposals will only be permitted where it has been demonstrated "that consideration has been given to the amenity of the users of neighbouring land and/or property". This includes protection from light pollution, air quality (including dust and odours), noise and vibration, and vermin.

5.16 These policies are considered sufficient to prevent development from occurring close to a European site or its functionally linked land, that would have an adverse effect on the integrity of the European site.

5.17 It is possible to conclude that the MWLP would not have an adverse effect on the integrity of any European sites due to non-physical disturbance, alone or in-combination with other plans and projects.

Air pollution

Vehicle emissions

5.18 The HRA screening (Chapter 4) identified the potential for impacts from vehicle emissions, arising from development that would increase traffic on roads within 200m of Chilterns Beechwoods SAC, Wormley Hoddesdonpark Woods SAC,

Lee Valley SPA/Ramsar (or its functionally linked land), or Epping Forest SAC.

5.19 The following policies would contribute to the control of vehicles arising from waste or minerals development:

- Policy 26: Cumulative Impacts - requires development proposals to demonstrate that they will not have 'unacceptable adverse effects on the environment of an area' and that ''particular regard' should be had to the 'natural, built and historic environment' and 'transport networks'.
- Policy 11: Sustainable Design and Resource Efficiency - requires that all development proposals demonstrate how they minimise waste generation and the use of primary aggregates, which could down on the need to transport waste/minerals by road.
- Policy 24: Transport - states that development proposals should minimise transport movements and distances travelled by road, through the use of sustainable methods such as rail and water. Proposals must demonstrate how movements on the highway will be minimised. Development should demonstrate that vehicles movements will not have 'unacceptable adverse effects' on the natural environment.

5.20 An assessment of potential effects at each of the relevant European sites is provided below.

Chilterns Beechwoods SAC

5.21 The A308, A404 and A4010, which pass parts of Chilterns Beechwoods SAC outside Hertfordshire, run north-south without entering Hertfordshire; the contribution of HDVs from waste/minerals developments in Hertfordshire to traffic flows on these routes is likely to be minimal.

5.22 Within Hertfordshire, the A41 passes within 200m of the Tring Woodlands SSSI portion of the SAC; 0.98 ha of the site falls within 200m. This portion of the SAC has *Asperulo-Fagetum* beech forests[49]; the other qualifying features of the SAC are not present at this location.

5.23 There are waste management sites, water recycling sites and employment sites close to the A41; and the road, as part of the PRN, could carry traffic from waste or minerals developments elsewhere in the county.

5.24 Traffic flows on the A41 in this location are currently c.22,000 AADT[50], of which c.1,400 are HDVs. Background traffic growth in Hertfordshire over the MWLP period (to 2040) has been estimated using TEMPro[51] to be c.15%, which would increase total traffic on the A41 by c.3,300 AADT. This exceeds the DMRB screening criteria, therefore additional (HDV) traffic from the MWLP could result in air pollution effects in-combination with general growth.

5.25 APIS data[52] shows that the nutrient N Critical Load range for *Asperulo-Fagetum* beech forests is 10 - 20 Kg N/ha/year. This is exceeded at the site, with N deposition recorded as between 29.5-35.0 (average 33.2) Kg N/ha/year. For acidity, the critical load is 1.647-11.18 keg/ha/year (CLmaxN). The minimum critical load is exceeded at the site but the maximum is not, with acid deposition of between 2.1-2.6 keg/ha/year recorded. Road transport is understood to be responsible for c.9.4% of N deposition at the SAC, with the remainder attributed to agricultural, industrial and international transport sources. The long term trends at the site indicate that contributions from nitrogen oxides (road transport & industry) and sulphur dioxides (industry & shipping) have been decreasing over the past 15 years, while contributions from ammonia (agriculture) have been increasing.

5.26 Tring Woodlands SSSI is currently in unfavourable recovering condition[53], although the reasons for the unfavourable condition are related to canopy cover / open space, e.g. from storm damage; nutrient enrichment has not been identified as an issue.

5.27 Although it is unlikely that the MWLP will result in significant effects at the SAC, there is currently insufficient data to demonstrate this; likely significant effects are uncertain.

5.28 LUC met with officers from Natural England during preparation of the Waste Local Plan HRA and the difficulties with assessing the Waste Local Plan's potential air pollution effects were discussed[54]. Natural England was minded to agree that, given the absence of allocated waste sites and traffic data, it would be pragmatic to allow more detailed HRA to be undertaken at the project stage i.e. once a site and proposals have been identified. The MWLP, similarly, does not allocated waste sites, although there are three allocated minerals sites. It is therefore difficult to quantify the in-combination effects of traffic from the MWLP on the European sites.

[49] https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001430.pdf
[50] https://roadtraffic.dft.gov.uk/manualcountpoints/26072
[51] https://www.gov.uk/government/publications/tempro-downloads
[52] APIS data for Chilterns Beechwoods SAC: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012724&SiteType=SAC&submit=Next
[53] Tring Woodlands SSSI condition https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1005030&SiteCode=S1001430&SiteName=tring&countyCode=&responsiblePerson=
[54] Duty to Cooperate meeting between Hertfordshire County Council, Lea Valley Regional Park Authority, Natural England and LUC, 4 November 2020

5.29 Because it is difficult to mitigate air pollution effects at the project level, for example by enforcing HGV vehicle routing, the MWLP needs to ensure that proposals found to contribute to an increase in traffic on the A41 where it passes within 200m of Chilterns Beechwoods SAC (or the roads close to the other European sites, described below) provide an assessment of air pollution effects (alone and in combination with existing and planned development) and cannot be granted planning permission if adverse effects on the integrity of the European site are predicted.

5.30 It would be unreasonable to require each waste or minerals development to create a traffic model of the county that includes traffic flows from planned development (for example neighbouring local plans) to assess in-combination effects. Therefore, Hertfordshire County Council will need to ensure that data from their COMET model is up to date and available to waste/minerals developers.

5.31 Safeguards will need to be embedded within the MWLP to ensure that adverse effects on integrity cannot occur. It is therefore recommended that Policies 24 and 26 are updated to explicitly require the provision of traffic data and project HRA, where proposals would increase traffic on roads close to sensitive European sites. Suggested wording is provided in Chapter 6.

5.32 Likely significant effects arising from air pollution (vehicle emissions) at Chilterns Beechwoods SAC are uncertain. Amendments to Policy 24 and Policy 26 are required in order to conclude no adverse effects on integrity.

Wormley-Hoddesdonpark Woods SAC

5.33 The A10, which is within 200m of the SAC, is part of the PRN; HDV traffic travelling between locations north of the SAC and the M25 could contribute to vehicle emissions at the SAC.

5.34 The A10 currently has traffic flows of c.35,000 AADT, of which c.1,900 are HGVs[55]. It is not possible to quantify traffic flows that could arise from the MWLP, however, total traffic flows in Hertfordshire are predicted to increase by c.15% to 2040[56] (the end of the MWLP plan period), which would increase flows on the A10 by c.5,250 AADT. This exceeds the DMRB screening criteria, therefore any additional (HDV) traffic from the MWLP could result in air pollution effects in-combination with general growth.

5.35 APIS data[57] states that the nutrient N Critical Load range for Sub-Atlantic and medio-European oak woodland is 15 - 20 Kg N/ha/year and the nutrient N deposition at the SAC exceeds this range, with a N deposition of between 35.0 to 46.1 (average 39.2) Kg N/ha/year.

5.36 The acid N Critical Load range for broadleaved woodland is 1.745 – 8.752keq/ha/yr. At the SAC, the background level of acid N deposition ranges between 2.5 - 3.2 keq/ha/yr with an average of 2.8 keq/ha/yr; which exceeds the minimum critical load for acid N deposition.

5.37 Road transport is understood to be responsible for 11.2% of N deposition at the SAC, with the remainder attributed to agricultural, industrial and international transport sources.

5.38 While the Site Improvement Plan for the SAC identifies atmospheric nitrogen deposition as a potential threat to the site, this is understood to be due to the known background exceedance, rather than any specific effects of the A10. It is also worth noting that the predominant wind direction in Hertfordshire is West-South-West to South-West; therefore the vast majority of N deposition will occur on the eastern side of the A10 carriageway, away from the Wormley Hoddesdonpark Woods SAC.

5.39 The latest condition assessment for the SSSI unit closest to the road (Wormley Hoddesdonpark Woods North SSSI, unit 005) identified this as being in favourable condition in 2017[58].

5.40 At its closest point, the A10 lies within 170m of the Wormley Hoddesdonpark Woods SAC, with approximately 0.1ha of the site (which is 336ha in total) falling within 200m of the road. The area of woodland within 200m of the road also partially comprises a metalled track which is likely to be used for the ongoing management of the woodland; therefore the woodland habitat itself is restricted to the form of a tree line rather than a continuous woodland block in this part of the SAC. Natural England typically considers features such as this track to form part of the 'site fabric'; these are areas of the site which do not directly comprise a SAC qualifying feature but have a supporting role for the maintenance of the site's integrity.

5.41 Although it is likely that, given the distance from the road and likely sensitivity of the features at the site, the effects of nitrogen from increased traffic on the A10 will be minimal, there is currently insufficient evidence to demonstrate this;

[55] https://roadtraffic.dft.gov.uk/manualcountpoints/6186
[56] Based on TEMPRO for years 2018 (latest year for which DfT traffic flows are available), 2022 (start of plan period) and 2036 (end of the plan period), using data from NTEM: East, Version 7.2
[57] http://www.apis.ac.uk/srcl/select-a-feature?site=UK0013696&SiteType=SAC&submit=Next (accessed 8 June 2020)
[58] https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1005045

therefore likely significant effects are uncertain. As critical loads for nitrogen are already being exceeded at the site and the background increase in traffic on the A10 exceeds the DMRB threshold of a 1,000 AADT increase, further assessment will be required to quantify and mitigate potential air pollution effects from waste development on Wormley Hoddesdonpark Woods SAC.

5.42 As with Chilterns Beechwoods SAC, it is recommended that Policies 24 and 26 are strengthened to require the provision of traffic data and project HRA for proposals that would increase traffic on the A10, where it passes within 200m of Wormley Hoddesdonpark Woods SAC. See Chapter 6 for suggested wording.

5.43 Likely significant effects arising from air pollution (vehicle emissions) at Wormley Hoddesdonpark Woods SAC are uncertain. Amendments to Policy 24 and Policy 26 are required in order to conclude no adverse effects on integrity.

Lee Valley SPA/Ramsar

5.44 The A414, which runs within 200m of the SPA/Ramsar is part of the primary route network, however, and could therefore carry HDV traffic from waste developments elsewhere in the county.

5.45 The A414 currently has traffic flows of c.25,000 AADT[59], of which c.1,100 are HGVs. As with other roads in Hertfordshire, growth to 2022 is expected to be c.15%, which would increase total traffic on the A414 by c.3,750 AADT. This exceeds the DMRB screening criteria, therefore additional traffic from the WLP could result in air pollution effects in-combination with general growth.

5.46 The qualifying features of the Lee Valley SPA are the following bird species:

- Bittern *Botaurus stellaris*;
- Gadwall *Anas strepera*; and
- Shoveler *Anas clypeata*.

5.47 The Ramsar is also designated for the presence of important gadwall and shoveler populations, in addition to the following notable species:

- Whorled water-milfoil *Myriophyllum verticillatum*, a plant species.
- *Micronecta minutissima* (a water-boatman), an invertebrate.

5.48 Bittern is identified as being potentially sensitive to nutrient N deposition and NOx, due to its association with the broad habitat type 'Fen, marsh and swamp'. The recommended Critical Load for nutrient N deposition is 15 – 30 N/ha/yr for this broad habitat type. N deposition at this habitat within the site is currently 19.3-43.5 (average 23.7) N/ha/yr, which exceeds the minimum and sometimes the maximum critical load for this habitat type. road transport is responsible for c.13% of this input, with the remainder attributable to agriculture, industry and long-range sources.

5.49 Gadwall and shoveler are associated with open water habitats, for which there are no recommended Critical Loads / Levels for N deposition; rather it is advised that such effects are assessed at a site specific level. The Site Improvement Plan and supplementary advice for conservation objectives for the SPA do not identify these species as being at risk of nutrient N deposition or NOx, therefore for the purposes of this assessment, gadwall and shoveler (and their associated open water habitats) are not considered to be sensitive to nutrient N deposition or NOx.

5.50 APIS data[60] indicates that none of the SPA qualifying features are sensitive to acid N deposition.

5.51 Priority habitats within the SPA / Ramsar which lie within 200m of the A414 (and might therefore be exposed to atmospheric nitrogen from vehicular emissions), have been mapped[61] as deciduous woodland, semi-improved grassland and floodplain grazing marsh. Bitterns are highly specialised species, and a study of bitterns in the Lee Valley revealed that they remain almost entirely within their reedbeds, moving only short distances to roost and forage[62]; it is therefore unlikely that this population would utilise the grassland and woodland habitats in this part of the SPA / Ramsar. They are also understood to be very sensitive to disturbance, and indeed the Lee Valley bittern study recommended that roost sites need to be disturbance-free; bitterns are therefore also considered to be unlikely to utilise the area of the SPA / Ramsar within 200m of the A414 due to noise disturbance.

5.52 The other notified features of the Ramsar (*Myriophyllum verticillatum* and *Micronecta minutissima*), are both species of open water habitats, which (as noted above) are not normally sensitive to N deposition or NOx; this is generally because freshwater habitats tend to be limited by concentrations of phosphate rather than N, with by far the largest inputs coming from surface water sources. The citation for the Ramsar also describes the nutrient status of the waterbody as 'highly

[59] https://roadtraffic.dft.gov.uk/manualcountpoints/81469
[60] http://www.apis.ac.uk/srcl/select-a-feature?site=UK9012111&SiteType=SPA&submit=Next
[61] https://magic.defra.gov.uk/MagicMap.aspx
[62] Harris, A. (2006) Roosting behaviour of wintering Eurasian Bitterns in the Lee Valley British Birds Vol. 99, p 174–182

eutrophic'[63], and in that respect it is unlikely to be affected by relatively small inputs of N from aerial pollution.

5.53 The MWLP has the potential to increase traffic flows on the A414 in combination with other plans, which could cause further exceedance of recommended Critical Loads / Levels for sensitive habitats within the SPA / Ramsar.

5.54 The only qualifying feature which is potentially sensitive to aerial pollution is bittern, due to its association with the broad habitat type 'Fen, marsh and swamp', although in reality, this species occurs almost exclusively within reedbed habitat, which is not present within 200m of the A414. Other qualifying features are not understood to be sensitive to aerial pollution.

5.55 Therefore, the area of the SPA / Ramsar which could feasibly be affected by air pollution is considered to be highly unlikely to support bittern due to a lack of suitable habitat (reedbed) and high levels of disturbance.

5.56 It is possible to conclude that the MWLP would not have an adverse effect on the integrity of Lee Valley SPA / Ramsar due to air pollution from vehicles, alone or in-combination with other plans and projects.

Epping Forest SAC

5.57 Epping Forest SAC lies within 200m of the M25 (and other major roads); the M25 passes through Hertfordshire and connects with the county's PRN. Waste and minerals traffic from Hertfordshire could therefore pass the SAC on the M25, and potentially other A roads connecting from the M25.

5.58 Traffic flows on the M25 near Epping Forest are currently c.111,000 AADT[64], of which c.20,000 are HGVs. Essex, similarly to Hertfordshire, is expected to experience an increase in traffic flows of c.15%, which would increase traffic on the M25 by c.16,500 AADT (although traffic flows on the M25 would also be influenced by growth outside Hertfordshire). This exceeds the DMRB screening criteria, therefore additional traffic from the MWLP could result in air pollution effects in-combination with general growth.

5.59 The Site Improvement Plan for Epping Forest SAC[65] identifies atmospheric nitrogen deposition as a pressure on the site's qualifying wet heathland with cross-leaved heath, European dry heaths, and beech forests on acid soils. APIS data[66] shows that nitrogen deposition at the site currently exceeds critical loads for all qualifying features. Road transport accounts for c.10% of the nitrogen deposition, and a Defra study[67] reports that local traffic is the most significant source of nitrogen. However, the M25 passes through Bell Common Tunnel at its nearest point to the SAC; the ends of the tunnel are c.20m from the SAC at the closest point and separated by a tree lined cutting. The SSSI unit nearest to the M25 is in favourable condition and this area of the SAC does not appear to be as significantly affected by air pollution as areas near other roads.

5.60 Epping Forest District Council (EFDC), in partnership with Natural England, has published an interim air pollution mitigation strategy[68] to address the effects of vehicle emissions on Epping Forest SAC. The document sets out a suite of proposed mitigation measures; a key component of which is a Clean Air Zone around the SAC, along with ongoing monitoring. The mitigation strategy takes into consideration the impacts from increased air pollution as a result of *"proposed housing and employment growth within and outwith the District for the period to 2033"*, although traffic arising in Epping Forest district is considered to be the main contributor. The HRA of the EFDC Plan concludes from traffic and air quality modelling that:

> *"… growth in Epping Forest District between 2014 and 2033 is the primary source of additional ammonia and NOx emissions on the modelled road sections and all other plans and projects make a negligible contribution to the in-combination effect."*

5.61 Waltham Forest council has also recently published an Air Pollution Mitigation Strategy[69]. It relies on 'soft' measures such as encouraging modal shift by improving opportunities for walking, cycling, public transport, and electric vehicle usage; and recommended HGV routing that avoids the . It concludes that 'hard' mitigation measures (e.g. changes to roads) would need to be implemented outside the borough in order to be effective. Waltham Forest therefore has limited control over 'hard' mitigation measures, but would support, for example, EFDC's clean air zone.

5.62 Policy 24: Transport states that development proposals should minimise transport movements and distances travelled by road, through the use of sustainable methods such as rail

[63] Joint Nature Conservancy Council (2000) Information Sheet on Ramsar Wetlands: Lee Valley
[64] https://roadtraffic.dft.gov.uk/manualcountpoints/28049
[65] Site Improvement Plan for Epping Forest SAC: http://publications.naturalengland.org.uk/publication/6663446854631424
[66] Air pollution data for Epping Forest SAC: http://www.apis.ac.uk/srcl/select-a-feature?site=UK0012720&SiteType=SAC&submit=Next
[67] Nitrogen deposition impacts on protected areas in the UKhttp://jncc.defra.gov.uk/pdf/4Page_booklet_nitrogenDep_ForWeb.pdf
[68] https://www.eppingforestdc.gov.uk/planning-and-building/planning-policy/statement-on-the-adoption-of-the-interim-air-pollution-mitigation-strategy/
[69] Waltham Forest (2022) Habitats Regulations Assessment Air Quality Mitigation Strategy, https://www.walthamforest.gov.uk/sites/default/files/2022-03/C0093_ClearLead_WF_AQ%20mit%20strategy_4.pdf

and water. This will help to reduce vehicle emissions associated with the MWLP.

5.63 While it seems unlikely that the contribution of waste and minerals traffic from Hertfordshire to the M25 would affect air pollution at Epping Forest SAC to the extent that further mitigation (ie in addition to that proposed by EFDC and Waltham Forest, in which the SAC is situated) would be required, there is currently insufficient evidence to rule out adverse effects on the integrity of Epping Forest SAC, from the MWLP in combination with other plans or projects.

5.64 Given the sensitivity of the SAC and presence of strategic mitigation measures, the approach to quantifying and if necessary mitigating the effects of air pollution from the MWLP requires further discussion with Natural England at the next stage of the HRA.

5.65 Likely significant effects arising from air pollution (vehicle emissions) at Epping forest SAC are uncertain. Further assessment, consultation with Natural England and if necessary the development of mitigation is required in order to conclude no adverse effects on integrity.

Summary

5.66 Likely significant effects can be ruled out in relation to Lee Valley SPA/Ramsar.

5.67 Likely significant effects are currently uncertain with respect to the potential effects of air pollution on Wormley-Hoddesdon Park Woods SAC, Chilterns Beechwoods SAC and Epping Forest SAC, either alone or in combination with other plans/projects.

5.68 Amendments to Policy 24 and Policy 26 are required in order to conclude no adverse effects on integrity at Wormley-Hoddesdon Park Woods SAC and Chilterns Beechwoods SAC.

5.69 At Epping Forest SAC, further assessment, consultation with Natural England and if necessary the development of mitigation is required in order to conclude no adverse effects on integrity.

Dust

5.70 The HRA Screening (Chapter 4) identified the potential for impacts from dust, arising from development within 500m of Chilterns Beechwoods SAC, Wormley Hoddesdon Park Woods SAC, or Lee Valley SPA/Ramsar (or its functionally linked land).

5.71 As above, Policy 15: Biodiversity and Geodiversity provides general protection for the European sites (see recommendations for strengthening policy wording in Chapter 6). Policy 19: Protection and Enhancement of Amenity requires proposals to demonstrate that they have considered the effects of dust on neighbouring land. Policy 21: Water Management provides additional safeguards where dust deposition into water bodies may be an issue.

5.72 Waste and minerals activities that would result in significant dust release, e.g. quarrying, require licensing from the Environment Agency; a condition of which is preventing dust and particulates. This could include measures such as dust extraction, dust suppression, and minimising vehicle movements on site[70].

5.73 There will be no adverse effects on the integrity of any European sites, as a result of industrial emissions arising from the MWLP, either alone or in combination with other plans or projects.

Industrial emissions

5.74 The HRA screening (Chapter 4) identified the potential for impacts from industrial emissions arising from energy from waste facilities within 10km of Chilterns Beechwoods SAC, Wormley Hoddesdon Park Woods SAC, or Lee Valley SPA/Ramsar (or its functionally linked land), Epping Forest SAC, Burnham Beeches SAC or Eversden & Wimpole Woods SAC.

5.75 Energy from waste, as with other waste facilities, could in theory be permitted at any of the locations identified in Policy 3 and have the potential to give rise to sources of atmospheric pollution, e.g. nitrogen and acid deposition; the level of emissions can vary depending on the scale of facility. However, all emissions will be subject to control under the Industrial Emissions Directive (Directive 2010/75/EU), transposed into law in England by The Environmental Permitting Regulations (England and Wales) 2010 (as amended)[71] and will require either a Part A(1) or A(2) environmental permit.

5.76 As above, Policy 15: Biodiversity and Geodiversity provides general protection for the European sites.

5.77 Alongside applying for planning permission to Hertfordshire County Council, energy from waste developers also need to apply for the relevant environmental permit from

[70] Environment Agency & Defra (2021) Guidance: Control and monitor emissions for your environmental permit, https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#dust-mud-and-litter

[71] The Environmental Permitting Regulations (England and Wales) 2010 (as amended) (No.675).

the Environment Agency. Permit applicants are required to undertake screening to identify European sites within 10km, calculate the predicted environmental concentration of each substance released to air and compare these with environmental standards, then take action to reduce emissions levels, where required[72]. This is considered a sufficient safeguard that likely significant effects on European sites can be avoided.

5.78 There will be no adverse effects on the integrity of any European sites, as a result of industrial emissions arising from the MWLP, either alone or in combination with other plans or projects.

Water quality and quantity

5.79 The HRA screening (Chapter 4) identified the potential for impacts from development resulting in changes to water quality or quantity, affecting Lee Valley SPA/Ramsar (or its functionally linked land), Chilterns Beechwoods SAC or Wormley Hoddesdon Park Woods SAC.

5.80 Lee Valley SPA/Ramsar would be affected by waste/minerals development within or close to the SPA/Ramsar's bodies of water, or those connected to it. Chilterns Beechwoods SAC and Wormley Hoddesdon Park Woods SAC could be affected by development that disrupts or abstracts from groundwater close to the site, e.g. abstraction of minerals or development in very close proximity to the sites.

5.81 Policy 15 Biodiversity & Geodiversity provides general protection for European sites and ensures that development would not be permitted within or very close to a European site, unless it could be demonstrated that there would be no adverse effects on the integrity of the site.

5.82 Policy 21 Water Management states that proposals will be supported where it is demonstrated that there are no unacceptable adverse impacts to the water environment, including the flow and quality of surface waters and groundwater. Proposals must demonstrate that they conserve and enhance the water environment.

5.83 Water abstraction and discharges arising from waste or minerals facilities would also be regulated through the Environmental Permit regime administered by the Environment Agency, which also takes into account environmental impacts including likely significant effects on European sites.

5.84 These policies are considered sufficient to prevent development from affecting water quality or quantity at a European site or its functionally linked land, that would have an adverse effect on the integrity of the European site.

5.85 It is possible to conclude that the MWLP would not have an adverse effect on the integrity of any European sites due to changes in water quality or quantity, alone or in-combination with other plans and projects.

[72] https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#screening-for-protected-conservation-areas

Chapter 6
Conclusions

Findings of the HRA process

6.1 The HRA Screening (Chapter 4) was unable to rule out likely significant effects in relation to:

- Physical damage and loss of habitat (European sites within Hertfordshire)
- Non-physical disturbance (Lee Valley SPA/Ramsar)
- Air pollution from vehicle emissions (European sites within Hertfordshire plus Epping Forest SAC)
- Air pollution from dust (European sites within Hertfordshire)
- Air pollution from industrial emissions (European sites within Hertfordshire plus Epping Forest SAC, Burnham Beeches SAC and Eversden and Wimpole Woods SAC)
- Changes to water quality or quantity (European sites within Hertfordshire)

6.2 The Appropriate Assessment in Chapter 5 considered whether the above likely significant effects will, in light of mitigation and avoidance measures, result in adverse effects on integrity of the European sites either alone or in-combination with other plans or projects.

6.3 The Appropriate Assessment concluded that safeguards within MWLP policies (particularly Policy 15) and measures such as environmental permitting are sufficient to rule out adverse effects on the integrity of European sites relating to the following (alone or in combination with other plans and projects):

- Physical damage or loss of habitat;
- Non-physical disturbance;
- Dust;
- Industrial emissions; and
- Changes to water quality or quantity.

6.4 The supporting text of Policy 15 could be amended to make reference to the potential for functionally linked land, although this would not alter the findings of the HRA. The following wording could be used (additional text shown underlined):

Proposals for new or extensions to existing minerals or waste development must be accompanied by an Ecological Survey and assessment of the impacts on designated sites, habitats, species and connections to existing ecological networks that may be affected. The type of impacts that could arise include habitat loss, damage or fragmentation; noise, vibration or light; changes in public access; air pollution; changes in water quality or flow; and vermin. Where a development site has wetland habitats, the ecological assessment should consider whether the site may be used by bird species from a SPA or Ramsar site.

6.5 In relation to air pollution from vehicle emissions, it was possible to rule out adverse effects on the integrity of Lee Valley SPA/Ramsar but not at Wormley-Hoddesdon Park Woods SAC, Chilterns Beechwoods SAC and Epping Forest SAC.

6.6 The area of Lee Valley SPA / Ramsar which could feasibly be affected by air pollution is considered to be highly unlikely to support bittern (the sensitive qualifying feature) due to a lack of suitable habitat (reedbeds) and high levels of disturbance.

6.7 At Epping Forest SAC, further assessment, consultation with Natural England and if necessary the development of mitigation is required in order to conclude no adverse effects on integrity.

6.8 Amendments to Policy 24 and Policy 26 are required in order to conclude no adverse effects on integrity at Wormley-Hoddesdonpark Woods SAC and Chilterns Beechwoods SAC. It is recommended that the policies are strengthened to require the provision of traffic data and project HRA for proposals that would increase traffic on the A10, where it passes within 200m of Wormley Hoddesdonpark Woods SAC or the A41 where it passes within 200m of Chilterns Beechwoods SAC. This requirement could be embedded in Policy 24 and cross-referenced in Policy 26 (or vice versa); for example:

Within supporting text:

"Vehicle emissions from traffic, particularly nitrogen, can affect sensitive habitats and species. The Habitats Regulations require that new development does not cause adverse effects on the integrity of sites designated as SPA, SAC or Ramsar sites. Wormley Hoddesdonpark SAC, Chilterns Beechwoods SAC, and Epping Forest SAC are all sensitive to air pollution and are within 200m of a main road that could be used by waste traffic from Hertfordshire."

Within the policy:

"Waste proposals that contribute traffic to the A10 or A41 (where they are within 200m of a SAC site) will need to carry out a Habitats Regulations Assessment. This will need to provide traffic data for the proposals to demonstrate whether they cause an increase in traffic of more than 200 AADT HDVs or 1,000 AADT daily traffic, either alone or in combination with existing and planned development (traffic flows for existing and planned development will be provided by Hertfordshire County Council). If the proposals exceed either of those traffic flow thresholds, an assessment of nitrogen deposition within the SAC and the effects on the integrity of the habitats/species for which it is designated will need to be provided. Further information is available from the Institute of Air Quality Management's document 'A guide to the assessment of air quality impacts on designated nature conservation sites'."

6.9 Suitable policy wording for Epping Forest SAC will be discussed and agreed with Natural England at the next stage of the HRA.

LUC

May 2022

Appendix A

Attributes of European Sites assessed

Table A.1: Attributes of European sites

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
European sites within or partially within Hertfordshire			
Chiltern Beechwoods SAC (1,276.48 ha)	*Natura 2000 Standard Data Form* *Asperulo-Fagetum* beech forests Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (important orchid sites) Stag beetle *Lucanus cervus*	*Natura 2000 Standard Data Form* ■ Invasive species ■ Restoration management is needed ■ Current and future threats of climate change ■ Long-term sustainability of the juniper populations is uncertain ■ Very low market value for timber *Natural England site improvement plan* Forestry and woodland management – with few gaps in the canopy, regeneration is restricted. To encourage regeneration and conservation of beech woodlands, restoration management is needed to diversify age and physical structure. Current and future threats of climate change are also likely to impact upon woodland regeneration and species composition. Deer – Deer species across the Chilterns include fallow, roe and muntjac. Browsing by deer prevents or hinders natural regeneration of trees and ground flora. Without regeneration, diversity of woodland age and physical structure is declining and this is particularly acute where age distribution is already limited. Not all parts of the SAC are affected, however, in those that are; current control measures appear ineffective in managing the problem.	Stag beetles, one of the site's qualifying species, depend on decaying tree stumps and fallen timber of broad-leaved trees especially: ■ Apple – *Malus* ■ Elm – *Ulmus* ■ Lime – *Tilia* ■ Beech – *Fagus sylvatica* ■ Oak - *Quercus* *Natural England: supplementary advice on conserving and restoring site features* The SAC depends on functionally-connected habitats: Functional connectivity with wider landscape - it is important that the SAC continues to sit in a landscape with good connectivity of habitats to maintain the condition of habitat in the long term, particularly in response to predicted changes in climate. Supporting off-site habitat – changes in surrounding land-use may adversely

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		Changes in species distributions - Fit-for-purpose species recording and data to allow monitoring of the stag beetle population is not currently in place, making it difficult to manage the population and its habitat appropriately. Invasive species - Grey squirrels *Sciurus carolinensis* and edible dormouse *Glis glis* damage growing trees by bark stripping. Where natural regeneration is occurring the trees are attacked between the ages of 20 and 40 if not before. It is not known if this is impacting on tree health or regeneration but there may be a need for vigilance, and to consider increased awareness of likely effects and signs of impacts. Control measures have resulted in little or no ecological change to date. Disease - Box blight has been observed at Ellesborough and Kimble Warrens SSSI which represent the rare habitat type of box-dominated woodland. Other diseases are possible. Public Access/Disturbance - Removal of dead wood by the public is an issue on some parts of the SAC. This could impact in saproxylic invertebrate fauna. Also storm-damaged dead wood may be removed in the interests of health and safety, and tidiness. Impact of Atmospheric nitrogen deposition - Atmospheric nitrogen deposition exceeds the critical loads for ecosystem protection. Some parts of the site are recorded as unfavourable (recovering), but impacts associated with nitrogen deposition are unclear. *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities:	(directly/indirectly) affect the functioning of the qualifying feature and its component species. Some of the key vulnerabilities identified at the SAC relate to supporting habitats/species or functionally connected habitat: Functional connectivity with wider landscape - it is important that the SAC continues to sit in a landscape with good connectivity of habitats to maintain the condition of habitat in the long term, particularly in response to predicted changes in climate. Supporting off-site habitat – changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the qualifying feature and its component species. Soils, substrate and nutrient cycling - Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this feature.

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		Functional connectivity with wider landscape - it is important that the SAC continues to sit in a landscape with good connectivity of habitats to maintain the condition of habitat in the long term, particularly in response to predicted changes in climate. Supporting off-site habitat – changes in surrounding land-use may adversely (directly/indirectly) affect the functioning of the qualifying feature and its component species. Undesirable species - there is a range of undesirable or uncharacteristic species which, if allowed to colonise and spread, are likely to have an adverse effect on the feature's structure and function, including its more desirable typical species. Soils, substrate and nutrient cycling - Changes to natural soil properties may therefore affect the ecological structure, function and processes associated with this feature. Tree age class distribution - Many Chilterns woodlands have relatively low age-class diversity which is often a legacy of historic management practices for timber production. The long-term aim is to promote a more natural structure	
Wormley Hoddesdonpark Woods SAC (336.47 ha)	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*	*Natura 2000 Standard Data Form* ■ Human intrusions and disturbances ■ Interspecific floral relations ■ Problematic native species ■ Air pollution, air-borne pollutants ■ Invasive non-native species	*Natural England: supplementary advice on conserving and restoring site features* The supplementary advice identifies the following non qualifying habitats/features that the qualifying features depend on: Vegetation community composition - maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Natural England site improvement plan Disease - Acute Oak Decline (AOD) is present in at least two parts of the site and affects both native oak species, which are key components of this woodland type. Invasive species - Several tree and shrub species not native to the site are present. Where they are not being actively controlled, they are gradually spreading. The more invasive of these include sycamore, turkey oak, rhododendron and snowberry. Air Pollution: risk of atmospheric nitrogen deposition - Nitrogen deposition exceeds the site-relevant critical load for ecosystem protection and hence there is a risk of harmful effects, but the sensitive features are currently considered to be in favourable condition on the site. Deer – Browsing and grazing by deer can reduce tree regeneration and damage the woodland understorey and ground flora. Deer damage levels are currently only moderate and do not appear to be affecting tree regeneration, habitat structure or species composition greatly. Vehicles: illicit - Illegal use of restricted byways and bridleways by off-road vehicles causes localised but sometimes severe rutting and soil compaction, damaging the woodland ground flora, shrubs and trees. Fly-tipping damages the ground flora directly and can introduce toxins and alien species. Forestry and woodland management - The larger woodland units with public access are under appropriate management but some of the smaller, privately-owned units are not which can result in a reduction in structural and species diversity (particularly in	appropriate, will be important to sustaining the overall habitat feature. Vegetation Structure – open space (for woodland pasture with old trees) - having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants. Vegetation structure – dead wood – for this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features. The vegetation community composition is as follows: The largest part of the site is oak-bracken-bramble woodland, dominated by sessile oak *Quercus petraea* and hornbeam *Carpinus betulus*, with areas of pedunculate oak *Quercus robur* and hornbeam. Further there are large stands of almost pure hornbeam (former coppice). There are also marshy areas with alder *Alnus glutinosa*, pendulous sedge *Carex pendula* and yellow pimpernel *Lysimachia nemorum* as well as areas with higher proportions of ash Fraxinus excelsior, Dogs Mercury *Mercurialis perennis* and Yellow Archangel *Lamium galeobdolon* on the chalky boulder clay. Areas dominated by bluebell

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		previously coppiced areas), the loss of temporary and permanent open space, the over-shading and deterioration of veteran pollards, and the spread of invasive species. Public Access/Disturbance – As the site is a large, attractive area of ancient woodland with extensive public access and close to large urban centres, it is heavily used by the public for recreational purposes. *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities: Vegetation community composition - maintaining or restoring these characteristic and distinctive vegetation types, and the range of types as appropriate, will be important to sustaining the overall habitat feature. Vegetation Structure – open space (for woodland pasture with old trees) - having some open, sunlit and largely tree-less areas as part of the woodland community is often important to facilitate natural tree and shrub regeneration and also to provide supporting habitat for specialist woodland invertebrates, birds, vascular and lower plants. Currently, the areas of open space within the wood-pasture areas are insufficient to meet the desired target. Vegetation structure – dead wood – for this habitat type, old or over-mature elements of the woodland are particularly characteristic and important features, and their continuity should be a priority.	*Hyacinthoides non-scripta* do occur, but elsewhere there are stands of great wood-rush *Luzula sylvatica* with carpets of the mosses *Dicranum majus* and *Leucobryum glaucum*. Locally, a bryophyte community more typical of continental Europe occurs, including the mosses *Dicranum montanum*, *D. flagellare* and *D. tauricum*.

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		Root zones of ancient trees - unless carefully managed, activities such as construction, forestry management and trampling by grazing livestock and human feet during recreational activity may all contribute to excessive soil compaction around ancient trees.	
Lee Valley SPA (451.29 ha)	*Botaurus stellaris* great bittern *Anas clypeata* northern shoveler *Anas strepera* gadwall	*Natura 2000 Standard Data Form* ■ Pollution to groundwater (point sources and diffuse sources) ■ Biocenotic evolution, succession ■ Outdoor sports and leisure activities, recreational activities ■ Human induced changes in hydraulic conditions ■ Marine and Freshwater Aquaculture *Natural England site improvement plan* Water Pollution - The vegetation and invertebrates provide food for the ducks, while fish provide food for the bitterns; and the habitat mosaic needs to vary from clear open water with abundant aquatic vegetation to moderately eutrophic conditions. Changes in water quality need to be managed to prevent loss of suitable habitat and food sources. Hydrological changes - Reservoir levels linked to operational requirements and all water bodies subject to natural fluctuations accounting for abstraction and climatic change. Public Access/Disturbance - Areas of the SPA are subject to a range of recreational pressures including watersports, angling and dog walking. This has the potential to affect SPA populations directly or indirectly.	*Natural England: supplementary advice on conserving and restoring site features* A021 *Botaurus stellarius*; Great bittern The reed-bed habitat is vital to the species, providing them with feeding areas and locations to hide. The majority of bittern are found in the Turnford and Cheshunt Pits site while Amwell Quarry and Rye Meads also support the species. Walthamstow Reservoirs also occasionally supports bittern. A051 *Anas strepera*; Gadwall (non-breeding) Gadwall favour gravel pits and reservoirs during the winter period where they feed on seeds, leaves and stems of water plants. Each of the supporting SSSIs support gadwall in numbers which are sufficient to qualify them as being of national importance. A056 *Anas clypeata*; Northern Shoveler (non-breeding) Shoveler are found throughout the site and in winter they frequent shallow water areas on marshes, flooded pasture, reservoirs and lakes

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Inappropriate scrub control - The reedbed habitats, muddy fringes, and bankside all provide habitat as part of the mosaic for the SPA birds. Scrub control is necessary to ensure these habitats are maintained. Fisheries: Fish stocking - Fish population and species composition needs to be appropriate to ensure suitable habitats including food resource and water quality are maintained for SPA bird species. Invasive species - *Azolla* and/or invasive aquatic blanket weeds will adversely affect aquatic habitat (food sources). Inappropriate cutting/mowing - The reedbed requires rotational management for bittern. Air Pollution: risk of atmospheric nitrogen deposition - Nitrogen deposition exceeds site relevant critical loads. *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities: Conservation measures - Active and ongoing conservation management is often needed to protect, maintain or restore *Botaurus stellaris* Great bittern (non-breeding) at this site. Vegetation characteristics - Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may	with plentiful, marginal reeds or emergent vegetation. The supplementary advice identifies the following non-qualifying habitats/features that the qualifying features rely on: Vegetation characteristics - Many bird species will have specific requirements that conservation measures will aim to maintain, for others such requirements will be less clear. Activities that may directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature. Connectivity with supporting habitats - Bitterns clearly move between sites within the Lee Valley and to do this they will need to move safely to and from supporting habitat between individual waterbodies and above/across land outside the SPA. Also, the ability of Northern Shoveler to safely and successfully move to and from feeding and roosting areas is critical to their adult fitness and survival. Water depth - As the birds will rely on detecting their prey within the water to hunt, the depth of water at critical times of year may be paramount for successful feeding and therefore their fitness and survival. Food availability within supporting habitat - the availability of an abundant food supply is critically

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		directly or indirectly affect the vegetation of supporting habitats and modify these characteristics may adversely affect the feature. Connectivity with supporting habitats - Bitterns clearly move between sites within the Lee Valley and to do this they will need to move safely to and from supporting habitat between individual waterbodies and above/across land outside the SPA. Also, the ability of Northern Shoveler to safely and successfully move to and from feeding and roosting areas is critical to their adult fitness and survival. Water depth - As the birds will rely on detecting their prey within the water to hunt, the depth of water at critical times of year may be paramount for successful feeding and therefore their fitness and survival. Population abundance – the population of Northern Shoveler within Lee Valley SPA has shown a slight decrease since Classification. The key SPA sites at Amwell and Turnford & Cheshunt Pits experienced a population decline during the 1999/00 – 2008/09 period, along with the functionally linked non-SPA Holyfield gravel pits. The SPA Walthamstow reservoirs and non-SPA Chingford reservoirs show population trends that appear to be related to water levels and available food resource. Food availability within supporting habitat - the availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct	important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. *Natural England site improvement plan* Water Pollution - The vegetation and invertebrates provide food for the ducks, while fish provide food for the bitterns; and the habitat mosaic needs to vary from clear open water with abundant aquatic vegetation to moderately eutrophic conditions. Changes in water quality need to be managed to prevent loss of suitable habitat and food sources. *BTO Bird Facts*[73] The site's qualifying bird species' diets are: ■ Bittern: mostly fish, amphibians, insects but wide variety; ■ Shoveler: omnivorous (incl. insects, crustaceans, molluscs, seeds); and ■ Gadwall: leaves and shoots.

[73] https://www.bto.org/about-birds/birdfacts

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population.	
Lee Valley Ramsar site (same area as the SPA)	*Information Sheet on Ramsar Wetlands* The site supports the nationally scarce plant species whorled watermilfoil *Myriophyllum verticillatum* and the rare or vulnerable invertebrate *Micronecta minutissima* (a waterboatman). Over winter the area regularly supports: Gadwell, *Anas strepera* – 456 individuals, representing an average of 1.5% of the population Shoveler, *Anas clypeata* – 406 individuals, representing an average of 1% of the population	*Information Sheet on Ramsar Wetlands* Recreation / tourism disturbance – the entire site supports high levels of visitor pressure; principally for purposes of angling, walking, cycling and birdwatching; with boating on the adjacent canal.	As for the SPA, with additional information on habitats and species at the site: Open water, with associated wetland habitats including reedbeds, fen grassland and woodland which support a number of wetland plant and animal species including internationally important numbers of wintering wildfowl.
European Sites outside Hertfordshire but within 15km			
Epping Forest SAC (1,630.74)	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*) Northern Atlantic wet heaths with *Erica tetralix* European dry heaths *Lucanus cervus* stag beetle	*Natura 2000 Standard Data Form* ■ Changes in biotic conditions ■ Air pollution, air-borne pollutants ■ Outdoor sports and leisure activities, recreational activities ■ Human induced changes in hydraulic conditions ■ Grazing	*Natural England site improvement plan* Inappropriate water levels - Wet heath is dependent on suitable ground water levels. There is a threat of prolonged drying out through climate change. Water pollution - Surface run-off of poor quality water from roads with elevated levels of pollutants,

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Natural England site improvement plan Air Pollution: impact of atmospheric nitrogen deposition - Nitrogen deposition exceeds site-relevant critical loads for ecosystem protection. Some parts of the site are assessed as in unfavourable condition for reasons linked to air pollution impacts. Undergrazing - The quality and diversity of the SAC features requires targeted management best achieved through grazing to: minimise scrub invasion; minimise robust grass domination, and maximise the species diversity of heathland plant communities. Public Access / Disturbance - Epping Forest is subject to high recreational pressure. Changes in species distributions - Beech tree health and recruitment may not be coping sufficiently with environmental conditions to sustain its presence and representation within the SAC feature. This may be linked to climate change as well as other factors such as air quality, recreational pressure and water availability. Inappropriate water levels - Wet heath is dependent on suitable ground water levels. There is a threat of prolonged drying out through climate change. Water pollution - Surface run-off of poor quality water from roads with elevated levels of pollutants, nutrients and salinity may be affecting wet heath, probably mostly around the edges. Invasive species - Heather beetle has locally impacted on some heathland areas. Grey squirrel is not currently known to be	nutrients and salinity may be affecting wet heath, probably mostly around the edges. Functional connectivity with wider landscape- The heathland resource is extensive in county terms but is fragmented, mainly by closed tree canopy habitat and roads. It is therefore vulnerable to encroachment, boundary effects, pollution, recreational impact and hydrological changes. The stag beetle requires decaying wood to complete its lifecycle. Its eggs are laid underground in the soil next to logs or the stumps of dead trees (typically apple *Malus* spp., elm *Ulmus* spp., lime *Tilia* spp., beech *Fagus* sylvatica and oak *Quercus* spp.). Timber is also utilised, especially sunken fence posts. *Natural England: supplementary advice on conserving and restoring site features* Beech Fagus sylvatica forests with holly *Ilex aquifolium*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech *Fagus* sylvatica and oak *Quercus* spp. was common. Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils with impeded drainage.

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		significantly affecting tree health or regeneration but this will need to be monitored. Disease - Tree diseases such as *Phytopthora* present a real threat to Beech. *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities: Adaptation and resilience of the feature – the vulnerability of Epping Forest SAC to climate change has been assessed by Natural England as being Medium taking into account the sensitivity, fragmentation, topography and management of its habitats. Functional connectivity with wider landscape- The heathland resource is extensive in county terms but is fragmented, mainly by closed tree canopy habitat and roads. It is therefore vulnerable to encroachment, boundary effects, pollution, recreational impact and hydrological changes. Vegetation structure - Variations in the structure of the heathland vegetation (vegetation height, amount of canopy closure, and patch structure) is needed to maintain high niche diversity and hence high species richness of characteristic heathland plants and animals. There is currently low cover (<25%) of dwarf shrubs present for the feature and less than 15% of scrub and tree cover. Soils - the soils of the wet heath habitat are vulnerable to, and have been exposed to acidification, nutrient enrichment and	European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Nearly all dry heath is seminatural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock. The stag beetle requires decaying wood to complete its lifecycle. Its eggs are laid underground in the soil next to logs or the stumps of dead trees (typically apple *Malus* spp., elm *Ulmus* spp., lime *Tilia* spp., beech *Fagus* sylvatica and oak *Quercus* spp.) The following vulnerabilities have been identified: Functional connectivity with wider landscape- The heathland resource is extensive in county terms but is fragmented, mainly by closed tree canopy habitat and roads. It is therefore vulnerable to encroachment, boundary effects, pollution, recreational impact and hydrological changes. Soils - the soils of the wet heath habitat are vulnerable to, and have been exposed to acidification, nutrient enrichment and pollution due to their fragmentation and proximity to roads and urban/residential development. Some plant or animal species (or related groups of such species) make a particularly important contribution to the necessary structure, function

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		pollution due to their fragmentation and proximity to roads and urban/residential development. Illumination - Epping Forest is fragmented by roads and largely surrounded by urban development and residential areas. Opportunities should be sought to minimise and reduce light pollution from existing development and any development plans or projects to ensure SAC features and significant biodiversity assets are safeguarded.	and/or quality of qualifying habitats. For wet heath, this includes: *Calluna vulgaris*, *Erica cinerea, E. tetralix, Salix repens, Ulex minor, Vaccinium spp. Carex panicea, C. pulicaris, Dactylorrhiza maculata, Eleocharis spp., Eriophorum angustifolium, Juncus acutiflorus, J. articulatus, Molinia caerulea, Anagallis tenella, Drosera spp., Galium saxatile, Genista anglica, Polygala serpyllifolia, Potentilla erecta, Succisa pratensis. Pedicularis sylvatica.* For dry heath, this includes: *Calluna vulgaris, Erica cinerea, E. tetralix, Ulex minor, Vaccinium spp Genista anglica, Agrostis spp., Carex spp., Danthonia decumbens, Deschampsia flexuosa, Festuca spp., Molinia caerulea, Nardus stricta, Galium saxatile, Hypochaeris radicata, Lotus corniculatus, Pedicularis sylvatica, Plantago lanceolata, Polygala spp. Potentilla erecta, Rumex acetosella, Succisa pratensis, Scilla verna, Serratula tinctoria, Teucrium scorodonia Thymus praecox, Viola riviniana,* There are many plants and animals which use or co-exist with non-native trees, but many rare and threatened woodland species are specialists adapted to one or a few native trees or shrub species (birches, willows and oaks, are examples of trees that host many specialist insect species). At this SAC, site-native species of tree and shrub include those typical of the H9120 type including Beech *Fagus sylvatica*, Oak *Quercus robur* and

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
			Quercus petraea, Holly *Ilex aquifolium*, Bramble *Rubus fruticosus* agg. Honeysuckle *Lonicera periclymenum*, Hornbeam *Carpinus betulus*, Silver birch *Betula pendula*, Downy birch *Betula pubescens*, Yew *Taxus baccata*, Elder *Sambucus nigra*, Goat willow *Salix caprea* and Wild Cherry *Prunus avium*. In addition to this, the characteristic mosaics and transitions of ancient forests and wood-pasture-types are well-represented within the site and are necessary for the conservation of SAC features and site integrity. Key species of ground flora, epiphytic bryophytes, mosses, liverworts and lichens are also listed.
Burnham Beeches SAC (383.71)	Atlantic acidophilous beech forests with *Ilex* and sometimes also Taxus in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*)	*Natura 2000 Standard Data Form* ■ Problematic native species ■ Other ecosystem modifications ■ Changes in biotic conditions ■ Outdoor sports and leisure activities, recreational activities ■ Air pollution, air-borne pollutants *Natural England site improvement plan* Air Pollution: risk of atmospheric nitrogen deposition - Epiphytic lichen communities are sensitive to nutrient deposition, promoting the growth of nutrient-tolerant species and reducing overall lichen diversity.	*Natural England: supplementary advice on conserving and restoring site features* The extent of the Annex I habitat feature at this SAC comprises a mosaic of plant communities including wood pasture, open mire, heath and acid grassland plus some stands of non-native conifers and poplars. This qualifying habitat comprises beech *Fagus sylvatica* forests with holly *Ilex*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood pasture systems, in which pollarding of beech and oak *Quercus* spp. was common.

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Public Access/Disturbance - Veteran trees are vulnerable to damage as a result of soil compaction due to trampling or vehicle movements in their root zone. Habitat fragmentation - There is high pressure for new housing development in the vicinity of Burnham Beeches which risks isolating the site from the surrounding countryside. Deer - Deer are numerous in the northern parts of the site and causing adverse impacts on tree regeneration and ground flora composition. Species decline - The number of veteran trees at the site is declining and there is a significant age gap between these and the next generation of future veterans. This could have significant impacts on habitat availability for specialised saproxylic invertebrates. Invasive species - Oak processionary moth is now well-established in sites close to Burnham Beeches. If it reaches Burnham Beeches control measures could pose a threat to native invertebrate populations. The site contains Rhododendron across the site which is of particular concern as it acts as host for the pathogen causing sudden oak death (which also affects beech). *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities:	For this feature, this attribute includes the extent of the full range of semi-natural habitats which make up the habitat mosaic. Veteran trees can include dead and living trees. Tree roots (particularly of veteran trees) may extend a considerable distance beyond the boundary of the site. At this SAC, site-native species of tree and shrub include Beech *Fagus sylvatica*, Oak *Quercus robur* and *Quercus petraea*, Holly *Ilex aquifolium*, Bramble *Rubus fruticosus* agg., Honeysuckle *Lonicera periclymenum*, Whitebeam *Sorbus aria*, Silver birch *Betula pendula*, Downy birch *Betula pubescens*, , Alder *Alnus glutinosa*, Hazel *Corylus avellana*, Elder *Sambucus nigra*, Rowan *Sorbus aucuparia*, Grey willow *Salix cinerea*, Juniper *Juniperus communis* Dead and actively decaying wood, either as part of a standing tree or as a fallen tree on the woodland floor, is an important component of woodland ecosystems, and supports a range of specialist invertebrates, fungi, lichens and bryophytes, and associated hole-nesting birds and roosting bats, all of which are very typical of the feature.

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		Vegetation community composition - the site includes blocks of conifers and broadleaved plantations. The objective is to replace these over time and to promote natural woodland composition and structure. It is desirable that beech remains a prominent component of the canopy at Burnham Beeches but it is acknowledged that there is natural variation in woodland composition across the site in relation to soil chemistry, soil wetness, soil depth etc. Soils - A potential threat to the soil composition is nutrient enrichment from dog waste, as the south of the site is accessible by the public. Hydrology - Disruption/ damage to hydrological processes could be caused by activities at some distance from the site boundary, e.g. through extraction of ground or surface waters; diverting or damming river channels; pollution of water source; channel alignment that disrupts natural geomorphological processes; tunnelling etc. Illumination - The site is on the edge of Slough and may be sensitive to increases in artificial light adjacent to the site.	
Eversden and Wimpole Woods SAC (66.22)	*Barbastella barbastellus*, barbastelle bat	*Natura 2000 Standard Data Form* ■ Forest and Plantation management & use ■ Unknown threat or pressure ■ Air pollution, air-borne pollutants ■ Changes in biotic conditions *Natural England site improvement plan*	*Natural England: supplementary advice on conserving and restoring site features* Barbastelles forage in mixed habitats, including over water. Barbastelles appear to select cracks and crevices in wood for breeding, mostly in old or damaged trees, but cracks and crevices in the timbers of old buildings may also be used. Maternity colonies may move between suitable

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Feature location/ extent/ condition unknown - Two transects within the site are monitored each year as part of the National Bat Monitoring Programme (NBMP). However there is some evidence that there could be other Barbastelle roosts or important foraging sites close to but not within the site. If this is the case then potentially important sites for the bats in the area are not protected. Offsite habitat availability/ management - The bats have a limited area in which to roost and forage within the site and it is unclear which habitats they use in the wider countryside. Forestry and woodland management - The woodland upon which the bats depend must be maintained in the medium to longer term by ensuring that tall trees, especially oak, grow up to replace those currently in place. Air Pollution: impact of atmospheric nitrogen deposition - Nitrogen deposition exceeds site-relevant critical loads. *Natural England: supplementary advice on conserving and restoring site features* In addition to the above, the supplementary advice identifies the following vulnerabilities: Distribution of supporting habitat - A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use	crevices within a small area, such as a piece of woodland or a complex of buildings. Caves and underground structures may be used for hibernation. The species is very sensitive to disturbance, together with the loss of roost-sites and food resources. Barbastelles are often associated with water and there are lakes and ponds in the parkland close to the roost (but off the SAC) at which they could forage. However all the tracking studies that have been carried out (less than 12 individuals in total) have had them flying north to Eversden Wood and dispersing from there. Having said that barbastelles have been detected all over the Wimpole Estate and it is known that there is a second maternity roost on the Estate, but outside the SAC. Distribution of supporting habitat - A contraction in the range, or geographic spread, of the feature (and its component vegetation) across the site will reduce its overall area, the local diversity and variations in its structure and composition, and may undermine its resilience to adapt to future environmental changes. Contraction may also reduce and break up the continuity of a habitat within a site and how well the species feature is able to occupy and use habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		habitat within the site. Such fragmentation may have a greater amount of open edge habitat which will differ in the amount of light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability. Woodland site: maternity colony - Bats typically forage within woodlands close to their roosts before commuting to core foraging areas. The structural diversity of supporting habitat will be important to maintain optimal feeding and foraging conditions in close proximity to maternity roosts; key aspects of woodland structure will include good canopy cover (typically 50-90%), an abundance of standing and fallen dead wood, areas of open space and the retention of open water and/or wetland features. There is no evidence that daytime public access to woodland used by barbastelles causes disturbance to these bats. It seems very likely that light pollution during hours of darkness would be disturbing.	light, temperature, wind, and even noise that it receives compared to its interior. These conditions may not be suitable for this feature and this may affect its viability. The supporting habitat of this feature is considered sensitive to changes in air quality. Exceedance of these critical values for air pollutants may modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition (including food-plants) and reducing supporting habitat quality and population viability of this feature. Woodland site: maternity colony - Bats typically forage within woodlands close to their roosts before commuting to core foraging areas. The structural diversity of supporting habitat will be important to maintain optimal feeding and foraging conditions in close proximity to maternity roosts; key aspects of woodland structure will include good canopy cover (typically 50-90%), an abundance of standing and fallen dead wood, areas of open space and the retention of open water and/or wetland features. Barbastelles may commute to foraging or sustenance areas along linear landscape features, such as woodland edges and, hedgerows, to cross extensive open areas (i.e. arable fields) to reach foraging grounds and may feed to a certain extent within these more open areas. Typical flight-lines

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
			used by this species include linear hedgerows, waterways, blocks of scrub, wooded rides and tracks. Such flight-lines should remain dark, unlit and well-connected to roosting and feeding areas. *Natural England site improvement plan* There is some evidence that there could be other Barbastelle roosts or important foraging sites close to but not within the site. If this is the case then potentially important sites for the bats in the area are not protected.
South West London Waterbodies SPA (825.1)	*Anas clypeata* northern shoveler *Anas strepera* gadwall	*Natura 2000 Standard Data Form* ■ Invasive non-native species ■ Abiotic (slow) natural processes ■ Changes in biotic conditions ■ Outdoor sports and leisure activities, recreational activities ■ Marine and Freshwater Aquaculture *Natural England site improvement plan* Public Access/Disturbance - Most of the sites have some level of formal or informal public access, including water-based activities on some waterbodies (angling, sailing, waterskiing). People can potentially disturb wintering Gadwall and Shoveler, and management for recreational uses may reduce the area of suitable habitat. Low numbers of Gadwall and Shoveler are associated with higher levels of disturbance.	*Natural England: supplementary advice on conserving and restoring site features* Gadwall favour shallow water bodies which are naturally eutrophic (nutrient-rich) with low levels of human disturbance, and tend to utilise lakes with an 'open' landscape character i.e. low levels of dense fringing vegetation of scrub or reed-beds. The Gadwall is a 'dabbling' duck feeding primarily on aquatic vegetation, including macrophytes and filamentous algae. Invertebrates may also be eaten as a minor part of the diet. They frequently demonstrate a degree of 'kleptoparasitic' behaviour in that they will feed on aquatic and semi-aquatic plants ('macrophytes') brought to the surface by other duck species and more usually coot. Water quality and chemistry are therefore important aspects in habitat suitability as factors such as high levels of turbidity or siltation may

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		Changes in species distributions - Gadwall numbers have been in decline on this SPA (-51% over 10 years up to 2009/10), which is not consistent with upwards national population trend. It is not yet confirmed that the changes in Gadwall and Shoveler numbers at the SPA is indicative of changing species distribution or of changing population size. Invasive species - Large areas of wetland and terrestrial habitat are infested with *Crassula helmsii* and this is likely to be reducing invertebrate numbers - Gadwall and Shoveler feed on invertebrates. Natural changes to site conditions - The inevitable maturation of gravel pits is altering roosting and feeding provision in terms of bankside vegetation, water chemistry and aquatic biodiversity. Fisheries: Fish stocking - Stocking of fish for recreation angling negatively impacts upon SPA bird populations. Fish de-stocking has been carried out in the past. Carp is particularly problematic. Inappropriate weed control - Control or removal of waterweed for watersports potentially impacts upon the availability of food for Gadwall and Shoveler. Invasive species - There are concerns that Egyptian geese are showing significant increases. Impacts on gadwall and shoveler not yet confirmed or quantified but there is potential that geese are competing with Gadwall and Shoveler for habitat and food. *Natural England: supplementary advice on conserving and restoring site features*	render sites or parts of sites unsuitable if macrophyte beds are affected. Like Gadwall, Shoveler favour similar types of inland waterbodies such as lakes and reservoirs with extensive shallows including beds of silt and submerged macrophytes. Like Gadwall they favour waterbodies with shallow margins/areas and where at least parts have an open, tree-less landscape character. They feed by filtering invertebrates and zooplankton from surface and shallow water, and from the lake bed/silt using their broad bill. They typically feed in areas with beds of macrophytes at shallow depth as these areas are often particularly rich in invertebrate food. A much larger proportion of their diet is made up by invertebrates and so is higher in calorific value than the predominantly plant food taken by Gadwall. Plant matter may also make a very minor part of Shoveler diet. Supporting habitat function: water quality/quantity - Poor water quality may significantly reduce habitat quality by reducing the health of macrophyte beds and hence availability of plant food. Supporting habitat function: conservation measures - Active and ongoing conservation management is often needed to protect, maintain or restore habitat suitability for Gadwall, particularly the favoured terrestrial habitats such

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
		In addition to the above, the supplementary advice identifies the following vulnerabilities: Supporting habitat function: water quality/quantity - Poor water quality may significantly reduce habitat quality by reducing the health of macrophyte beds and hence availability of plant food. Supporting habitat function: conservation measures - Active and ongoing conservation management is often needed to protect, maintain or restore habitat suitability for Gadwall, particularly the favoured terrestrial habitats such as grassland and rush pasture, including bankside/shore habitat. Food availability - Inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. It is important that areas of high quality food supply are maintained in areas of low disturbance, with suitable surrounding habitat conditions for Shoveler i.e. areas of shallow water which are unshaded or only lightly shaded, and an absence of extensive beds of tall emergent vegetation such as reed-beds. Extensive cover of floating plants such as water-lilies is also undesirable. Air pollution - the structure and function of habitats which support gadwall may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of water bodies, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of feeding or roosting habitat.	as grassland and rush pasture, including bankside/shore habitat. Food availability - Inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. It is important that areas of high quality food supply are maintained in areas of low disturbance, with suitable surrounding habitat conditions for Shoveler i.e. areas of shallow water which are unshaded or only lightly shaded, and an absence of extensive beds of tall emergent vegetation such as reed-beds. *BTO Bird Facts*[74] The site's qualifying bird species' diets are: ■ Shoveler: omnivorous (incl. insects, crustaceans, molluscs, seeds); and ■ Gadwall: leaves and shoots.

[74] https://www.bto.org/about-birds/birdfacts

Site name (Area, ha)	Qualifying features	Key vulnerabilities	Non-qualifying habitats and species upon which the qualifying habitats and/or species depend
South West London Waterbodies Ramsar site (same area as the SPA)	Information Sheet on Ramsar Wetlands *Anas clypeata* northern shoveler – 397 individuals, representing an average of 2.6% of the GB population *Anas strepera* gadwall – 487 individuals, representing an average of 2.8% of the GB population	*Information Sheet on Ramsar Wetlands:* Potential future decommissioning of reservoirs once they are no longer required for the purposes of water supply, as well as the potential impacts of maintenance works which may require winter draw-down of reservoirs. The threat from potential development pressures in this urbanised and urban-fringe area is largely covered by the relevant provisions of the Conservation Regulations (1994). Levels of disturbance from recreational activities are an issue on one part of the site.	As for the SPA, with additional information on habitats and species at the site: Open water, plus associated wetland habitats including grassland and woodland supporting a number of wetland plant and animal species including internationally important numbers of wintering wildfowl. ■ Great crested grebe, *podiceps cristatus* ■ Great cormorant, *Phalacrocorax carbo* ■ Tufted duck, *Aythya fuligula* ■ Black-necked grebe, *Podiceps nigricollis* ■ Smew, *Mergellus albellus*

Appendix B
Screening Matrix

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Hertfordshire Minerals & Waste Local Plan
June 2022

Green indicates no likely significant effects; orange indicates that likely significant effects are uncertain; grey indicates safeguards/mitigation provided within policies.

Table B.1: Screening matrix

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
Policy 1: Climate Change	None- this policy will not result in new development/ activities	n/a	No This policy encourages on site water efficiency, which could contribute to mitigation for water quality / quantity impacts.
Policy 2: Meeting Sand and Gravel Needs (additional 18.56Mt sand and gravel required during Plan period. Three allocated sites: – MAS1: The Briggens Estate (8.8Mt) – MAS2: Hatfield Aerodrome – MAS3: Land adjoining Coopers Green Lane)	Sand and gravel extraction (e.g. infrastructure, buildings, extraction, industry) Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality/quantity Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat	Uncertain – This policy sets out where sand and gravel development may take place (allocated sites, plus locations outside these, where required) and sets out the overall volume of aggregates required to be extracted. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 3: Meeting Waste Management Needs (Development permitted only within: a. Waste Management Sites (WMS); or	Waste management facilities for recycling, compost, landfill, hazardous waste and anaerobic digestion. Recovery of materials and waste Transfer of hazardous and non-hazardous waste Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality/quantity Non-physical disturbance Loss/ damage/ fragmentation of functionally- linked habitat. Introduced species	Uncertain – This policy sets out where waste development may take place and provides an indication of the overall quantum of waste treatment required. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site.

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
b. Land allocated for employment in the Development Plan; or c. Existing employment land within the development limits of existing/new major settlements [settlements named in policy])	Industrial emissions		
Policy 4: Site Safeguarding and Consultation Areas	None- this policy safeguards existing and future minerals and waste sites but will not itself result in new development.	n/a	No However, this policy establishes Site Safeguarding Areas (SSAs) for existing and future minerals and waste management and infrastructure. These comprise Minerals Allocation Sites (MAS), Minerals Development Sites (MDS), Transport Infrastructure Sites (TIS), Waste Management Sites (WMS) and Water Recycling Site (WRS). This policy should therefore be taken into consideration when assessing development coming forward under other policies in this plan.
Policy 5: Mineral Safeguarding Areas	Mineral extraction Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy safeguards known minerals resources (minerals safeguarding areas) and could result in minerals extraction being required as part of non-minerals development within those areas. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 6: Brick Clay	Brick clay working (extraction, plus potentially infrastructure, buildings, industry) Changes in water use	Air pollution Changes in water quality	Uncertain – this policy permits new brick clay workings, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity.

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
	Changes in vehicle traffic	Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 7: Chalk	Chalk extraction (extraction, plus potentially infrastructure, buildings, industry) Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy permits new chalk extraction, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 8: Borrow Pits	Excavation for the creation of a borrow pit Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy permits borrow pits, with no locations specified. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site. The policy states that proposals for borrow pits will be supported where it can be demonstrated that the site's proximity to a construction project is more sustainable than importing aggregate; therefore use of a borrow pit could be expected to contribute less to air pollution than imported aggregates.
Policy 9: Incidental Mineral Extraction	Mineral extraction Changes in water use	Air pollution Changes in water quality	Uncertain – this policy permits incidental mineral extraction (e.g. while developing a site for other purposes, which could include reservoir creation), with no locations specified. This policy will therefore contribute

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
	Changes in vehicle traffic	Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 10: Secondary and Recycled Materials	Facilities for processing, distributing and re-processing aggregates Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality/quantity Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat	Uncertain – this policy permits new processing/distribution facilities, at any 'appropriate' location. This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site. The policy states that any proposals "must demonstrate that the siting, scale and design of the development is appropriate to the location and character of the surrounding natural and built environment; any landscaping and screening of the site is designed to effectively mitigate the visual impact of the proposal; the proposed development would not adversely impact upon the natural, built or historic environments, amenity or human health; the transportation of aggregates will not have a significant adverse impact on highways safety and the effective operation of the highway network; and there would not be an unacceptable adverse cumulative impact on the local area." This would contribute to mitigation coming forward under this policy.
Policy 11: Sustainable Design and Resource Efficiency	None- this policy sets out principles for sustainable design and will not result in new development	n/a	No This policy requires that proposals demonstrate consideration of a range of environmental issues, including biodiversity, water management, noise and odour. All development proposals must demonstrate how they minimise waste generation and the use of primary aggregates. This policy

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
			may therefore contribute to general environmental safeguards, as well as cutting down on the need to transport waste/materials by road.
Policy 12: Landfill Excavation	Landfill excavation (e.g. excavation, industry, transport, restoration) Changes in water use Changes in vehicle traffic	Air pollution Changes in water quality Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy permits the excavation and re-restoration of historic landfill sites, with no locations specified (albeit limited to historic landfills). This policy will therefore contribute to impacts that arise from the scale and location of development, for example air pollution and changes in water quantity. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 13: Restoration, Aftercare and After-use	None- sets out principles for the restoration of sites used for mineral extraction and temporary waste development, but will not itself result in new development.	n/a	No
Policy 14: Green Belt	None- this policy sets out the principles under which development within the Green Belt will be permitted, but will not itself result in new development.	n/a	No - this policy will not result in new development. However, as much of Hertfordshire is designated as Green Belt, this policy may result in MWLP development (e.g. under Policy 1) being encouraged in the few non-Green Belt areas, such as adjacent to Chilterns Beechwoods SAC. This policy will need to be considered when assessing policies that permit development outside of defined areas such as the allocated Minerals sites.
Policy 15: Biodiversity and Geodiversity	None- this policy sets out principles for the protection of biodiversity and geodiversity and will not result in new development.	n/a	No The policy states that “sites which benefit from designation at an International and European Level, including Ramsar Sites, SPAs and SACs, will be afforded the highest level of protection. Development proposals that are likely to have an adverse effect on the integrity of such sites will not be permitted unless exceptional circumstances can be clearly demonstrated.” And that: “All proposals for minerals and waste management development must clearly demonstrate that throughout the

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
			lifetime of the development (including restoration where applicable): d) the impact on biodiversity through loss of or damage to habitats and/or species is minimised….." "All proposals for new, and extensions to existing minerals and waste management development, must submit an ecological survey of the site, prepared by a suitably qualified professional, prior to development taking place…" This policy therefore provides general protection for European sites.
Policy 16: Landscape and Green Infrastructure	None- this policy sets out principles for the protection of landscape and green infrastructure and will not result in new development.	n/a	No
Policy 17: Soils and Agricultural Land	None- this policy sets out principles for the protection of soil and agricultural land and will not result in new development	n/a	No
Policy 18: Historic Environment	None- this policy sets out principles for the projection of the historic environment and will not result in new development.	n/a	No
Policy 19: Protection and Enhancement of Amenity	None- this policy sets out principles for the protection of amenity and will not result in new development.	n/a	No This policy outlines that development proposals will only be permitted where it has been demonstrated "that consideration has been given to the amenity of the users of neighbouring land and/or property". This includes protection from light pollution, air quality (including dust and odours), noise and vibration, and vermin. This policy could therefore contribute to mitigation for impacts associated with non-physical disturbance or introduced species.
Policy 20: Health and Wellbeing	None- this policy sets out principles for considering health effects and will not result in new development.	n/a	No

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
Policy 21: Water Management	None- this policy sets out principles relating to water supply, water quantity, water quality and flood risk and will not result in new development.	n/a	No This policy states that proposals will be supported where it is demonstrated that there are no unacceptable adverse impacts to the water environment, including the flow and quality of surface waters and groundwater. Proposals must demonstrate that they conserve and enhance the water environment. This policy would contribute to mitigation for water quality/ quantity impacts.
Policy 22: Water Recycling Sites	Water recycling infrastructure (including associated infrastructure such as renewable energy) Changes in water use / treatment	Changes in water quality Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy permits new water recycling sites, which are likely to be close to watercourses. Water will need to be treated prior to discharge, but there may be a residual risk of water pollution. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 23: Transport Infrastructure Sites	Transport infrastructure Changes in vehicle traffic	Air pollution Non-physical disturbance Physical habitat loss/ damage/ fragmentation Loss/ damage/ fragmentation of functionally- linked habitat.	Uncertain – this policy permits infrastructure required for the sustainable transport of minerals and waste, within Transport Infrastructure Sites (TIS). This policy is therefore intended to reduce the adverse effects of transport (e.g. air pollution), but may alter traffic flows such that air pollution increases in some areas. Depending on the location of the development, there is also the potential for the loss of functionally-linked habitat; or non-physical disturbance (noise / light) if close to a European site. In theory, this policy could also permit development within a European site.
Policy 24: Transport	None- this policy sets out principles for siting development and managing transport impacts, but will not itself result in new development.	n/a	No This policy requires that development proposals minimise transport movements and distances travelled by road, through the use of sustainable methods such as rail and water. Where transportation by road is necessary, proposals should, where practicable, be well located in relation to the primary route network and must clearly demonstrate why transportation by road is justified and how movements on the highway will

Policy	Likely activities to result as a consequence of the proposal	Likely effect if proposal is implemented	Will the proposal have likely significant effects and therefore require Appropriate Assessment?
			be minimised. Development should demonstrate that vehicles movements will not have 'unacceptable adverse effects' on the natural environment. This policy will therefore contribute to mitigation for air pollution impacts.
Policy 25: Public Rights of Way	None- this policy sets out principles for the protection of rights of way and will not result in new development	n/a	No
Policy 26: Cumulative Impacts	None- this policy states that development will not be permitted where unacceptable cumulative impacts will occur, and will not result in new development.	n/a	No The policy requires development proposals to demonstrate that they will not have 'unacceptable adverse effects on the environment of an area' and that ''particular regard' should be had to the 'natural, built and historic environment'. This could contribute to mitigation for the type of impacts that tend to arise cumulatively, for example air pollution and changes in water quantity (although it is difficult for individual developments to mitigate cumulative effects).
Policy 27: Aerodrome Safeguarding Areas	None- this policy safeguards aerodrome uses and will not itself result in new development.	n/a	No