ESSENTIAL REFERENCE PAPER B

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East Herts
District Council

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East Herts District Plan Habitats Regulations Assessment

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1 Introduction

1.1 Background to the Project

1.1.1 AECOM was appointed by East Herts District Council to assist the Council in undertaking a Habitat Regulations Assessment of its District Plan (hereafter referred to as the 'Plan' or 'District Plan'). The objective of this assessment was to identify any aspects of the Plan that would cause an adverse effect on the integrity of Natura 2000 sites, otherwise known as European sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and, as a matter of Government policy, Ramsar sites), either in isolation or in combination with other plans and projects, and to advise on appropriate policy mechanisms for delivering mitigation where such effects were identified.

1.1.2 An assessment of housing need across the East Herts and West Essex Housing Market Area (HMA) has been conducted, which was then used as the basis for developing the District Plan. The HMA covers Epping Forest District Council, Harlow Council, East Herts District Council and Uttlesford District Council. The HMA developed a series of different Options for quanta and distribution of housing in each of the Authority boundaries, focussed on growth within the broad Harlow area. To underpin this, traffic modelling and an air quality impact assessment regarding impacts on Lee Valley SPA/Ramsar site and Epping Forest SAC was undertaken of each of the Options. Data from that analysis is used to inform this HRA.

1.2 Legislation

1.2.1 The need for Appropriate Assessment is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2010. The ultimate aim of the Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*" (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

1.2.2 The Habitats Directive applies the precautionary principle to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

1.2.3 In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question:

Box 1: The legislative basis for Appropriate Assessment

Habitats Directive 1992

Article 6 (3) states that:

"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."

Conservation of Habitats and Species Regulations 2010

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

1.2.4 Over time the phrase 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Directive from screening through to Imperative Reasons of Overriding Public Interest (IROPI). This has arisen in order to distinguish the process from the individual stage described in the law as an 'appropriate assessment'. Throughout this report we use the term Habitat Regulations Assessment for the overall process and restrict the use of Appropriate Assessment to the specific stage of that name.

1.3 Scope of the Project

1.3.1 There is no pre-defined guidance that dictates the physical scope of a HRA of a Plan document. Therefore, in considering the physical scope of the assessment, we were guided primarily by the identified impact pathways (called the source-pathway-receptor model) rather than by arbitrary 'zones'. Current guidance suggests that the following European sites be included in the scope of assessment:

- All sites within the East Herts District boundary; and
- Other sites shown to be linked to development within the District boundary through a known 'pathway' (discussed below).

1.3.2 Briefly defined, pathways are routes by which a change in activity provided within a District Plan document can lead to an effect upon an internationally designated site. Guidance from the former Department of Communities and Local Government states that the HRA should be '*proportionate to the geographical scope of the [plan policy*]' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (CLG, 2006, p.6). More recently, the Court of Appeal [1] ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be '*achieved in practice'* to satisfied that the proposed development would have no adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a Core Strategy document)[2]. In this case the High Court ruled that for 'a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of reg 61 of the Habitats Regulations'.

1.3.3 There are three European sites that lie partly within East Herts:

- Lee Valley SPA;

[1] No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17th February 2015
[2] High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

- Lee Valley Ramsar site; and
- Wormley-Hoddesdonpark Woods SAC

1.3.4 Outside the District, the following site also requires consideration because there is potential for impacts stemming from the District Plan to create significant effects even though the site lies outside the authority boundary:

- Epping Forest SAC

1.3.5 Eversden & Wimpole Woods SAC (located 16km to the north of East Herts) was given preliminary consideration since the barbastelle bat population at that site is known to forage well outside the site boundary. However, work undertaken for the South Cambridgeshire Biodiversity Strategy identifies the area of key importance for the barbastelle bats for which the SAC was designated. The southern-most part of this area of importance is situated approximately on a line with Whaddon and Meldreth and thus approximately 10km north of East Herts. Since the District Plan does not propose any development outside the district boundary this SAC is therefore not considered further.

1.3.6 The reasons for designation of these sites, together with current trends in habitat quality and pressures on the sites, are indicated in Chapters 4 to 8. All the European sites are illustrated in Appendix A, Figure A1.

1.3.7 In order to fully inform the screening process, a number of recent studies have been consulted to determine likely significant effects that could arise from the East Herts District Plan. These include:

- Final Water Resources Management Plan, 2015-2020. Affinity Water) June 2014
- Rye Meads Water Cycle Study (Hyder Consultancy, October 2009);
- Core Strategies (and HRAs) for Harlow, Epping Forest District, Broxbourne District, Hertsmere Borough, London Borough of Waltham Forest, St Albans District, Uttlesford District, Stevenage Borough and Welwyn Hatfield District;
- Recreational activity, tourism and European site recreational catchment data – where available have used data that exists for individual European sites but in many cases these do not exist. In such circumstances have used appropriate proxy from other European sites designated for similar features and in similar settings;
- Hertfordshire County Council. Local Transport Plan. Volume 2. Transport Policy Document (April 2011)
- Lee Valley Regional Park Development Framework
- The UK Air Pollution Information System (www.apis.ac.uk); and
- Multi Agency Geographic Information for the Countryside (MAGIC)and its links to SSSI citations and the JNCC website (www.magic.gov.uk)

1.4 This Report

1.4.1 Chapter 2 of this report explains the process by which the HRA has been carried out. Chapter 3 explores the relevant pathways of impact. Chapter 4 contains an initial sift of District Plan policies to determine which present potential scope for impacts on European sites. Chapters 5 to 8 then provide more detailed screening (likely significant effects assessment) of each impact pathway. Each chapter begins with a consideration of the interest features and ecological condition of the site(s) and of the environmental processes essential to maintain their integrity. An assessment of the Plan in respect of each European site is then carried out mitigation strategies are proposed where necessary[3]. The key findings are summarised in Chapter 9: Overall Conclusions.

[3] Legal precedent confirms that it is perfectly acceptable to reference mitigation measures at the screening stage of HRA, if that is the stage at which they can be identified.

2 Methodology

2.1 Introduction

2.1.1 The HRA has been carried out in the continuing absence of formal central Government guidance, although general EC guidance on HRA does exist[4]. The former Department of Communities and Local Government (DCLG) released a consultation paper on the Appropriate Assessment of Plans in 20065. As yet, no further formal guidance has emerged. However, Natural England has produced its own internal guidance[6] as has the RSPB[7]. Both of these have been referred to alongside the guidance outlined in paragraph 1.2.3 in undertaking this HRA.

2.1.2 Figure 1 below outlines the stages of HRA according to current draft DCLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

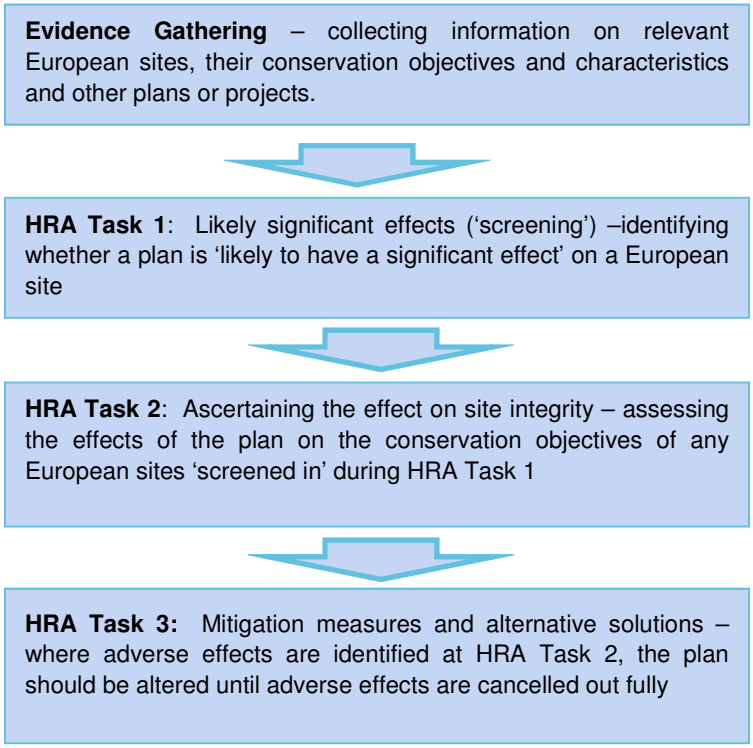


Figure 1: Four Stage Approach to Habitats Regulations Assessment. Source CLG, 2006.

[4] European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.
[5] CLG (2006) Planning for the Protection of European Sites, Consultation Paper
[6] http://www.ukmpas.org/pdf/practical_guidance/HRGN1.pdf
[7] Dodd A.M., Cleary B.E., Dawkins J.S., Byron H.J., Palframan L.J. and Williams G.M. (2007) *The Appropriate Assessment of Spatial Plans in England: a guide to why, when and how to do it.* The RSPB, Sandy.

2.2 HRA Task 1 - Likely Significant Effects (LSE)

2.2.1 Following evidence gathering, the first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

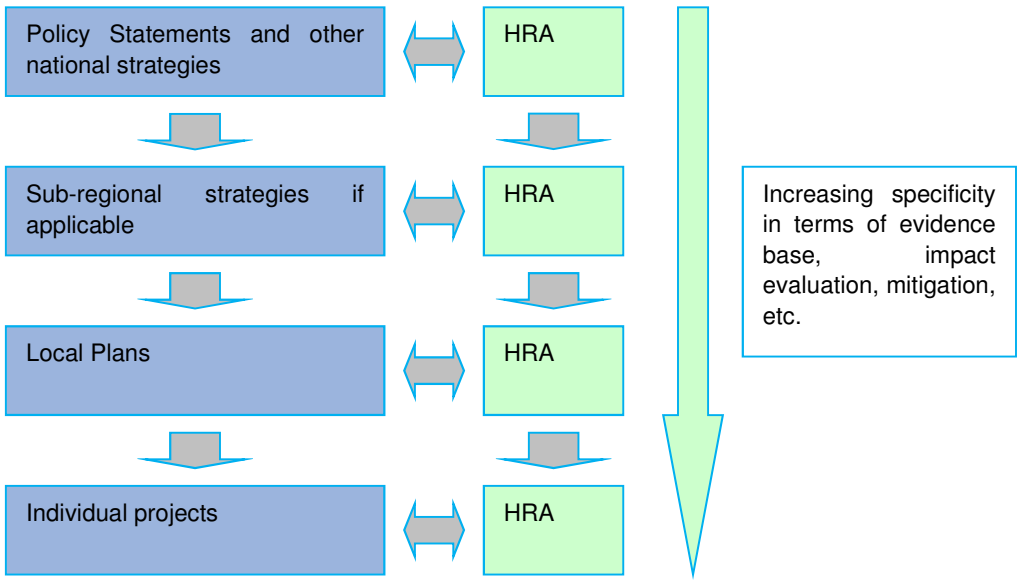
"*Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*

2.2.2 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites.

2.2.3 In evaluating significance, AECOM have relied on our professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.

2.2.4 The level of detail in land use plans concerning developments that will be permitted under the plans will never be sufficient to make a detailed quantification of adverse effects. Therefore, we have again taken a precautionary approach (in the absence of more precise data) assuming as the default position that if an adverse effect cannot be confidently ruled out, avoidance or mitigation measures must be provided. This is in line with the former Department of Communities and Local Government guidance and Court rulings that the level of detail of the assessment, whilst meeting the relevant requirements of the Conservation Regulations, should be 'appropriate' to the level of plan or project that it addresses. This 'tiering' of assessment is summarised in Box 2.

Box 2: Tiering in HRA of Land Use Plans



2.2.5 When discussing 'mitigation' for a District Plan document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since the District Plan document is a high-level policy document.

2.3 Principal Other Plans and Projects That May Act 'In Combination'

2.3.1 It is neither practical nor necessary to assess the 'in combination' effects of the Plan within the context of all other plans and projects within Hertfordshire and the neighbouring local authorities in south Cambridgeshire and west Essex. In practice therefore, in combination assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects relate to the additional

housing and commercial/industrial allocations proposed for other relevant Cambridgeshire, Essex and Hertfordshire authorities over the lifetime of the District Plan, particularly Epping Forest, Harlow and Uttlesford.

Table 1: Housing levels to be delivered across Hertfordshire and surrounding authorities, provided for context.

Local Authority	Total housing provided
North Hertfordshire	16,925[8] (2011-2031)
Uttlesford	These three authorities with East Herts are working together as part of a Strategic Market Area (SMA). Where impacts in combination such as air quality impacts are considered, these assessments will be based in the level of development provided within the SMA.
Epping Forest	
Harlow	
Broxbourne	7,123[9] (2014-2031)
Welwyn Hatfield	12,500[10] (2011-2031)
Stevenage	7,600[11] (2011-2031)

2.3.2 There are other plans and projects that are relevant to the 'in combination' assessment, most notably Thames Water's Final Water Resources Management Plan (WRMP) 2015-2040 (2014), Essex and Suffolk Water's Final WRMP (2014), Cambridge Water Company's WRMP (2014) and the Environment Agency's Upper Lee Abstraction Licensing Strategy (2013) and Review of Consents report for the Lee Valley SPA/Ramsar site. These are all taken into account in this assessment.

2.3.3 The Minerals and Waste Development Frameworks for Hertfordshire, Essex, London and Cambridgeshire are also of some relevance, since these may well contribute to increased vehicle movements on the road network within East Herts (and thereby contribute to air quality impacts). The Hertfordshire, Essex and Cambridgeshire Local Transport Plans to 2031 will also be important in determining vehicle movements on the highways network in the short term. However, the major impact is likely to be that of housing and commercial development within the surrounding districts as set out in Local Development Frameworks and these have therefore been the main focus of cumulative 'in combination' effects with regard to this HRA. In this context, we have also consulted the London Plan (Consolidated with Alterations 2016).

2.3.4 In relation to recreational activity, the following documents have been consulted for their plans and projects that may affect European sites in combination with development in East Herts: East Herts Parks and Open Spaces Strategy (2013); Lee Valley Regional Park Authority Site management Plan; Epping Forest Management Plan and visitor surveys[12]; Hoddesdonpark Wood Management Plan; Wormley Wood and Nut Wood Management Plan.

2.4 Air Quality Impact Assessment

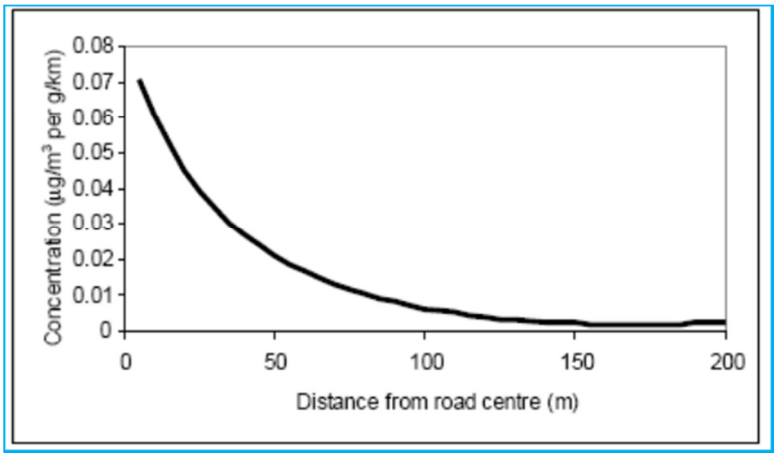
2.4.1 To support the HMA Options, traffic modelling and air quality impact assessment in line with the standard Design Manual for Roads and Bridges (DMRB) methodology[13] was undertaken comparing

[8] Proposed Submission Local Plan (2016)
[9] Regulation 18 full draft Local Plan for Broxbourne(2016)
[10] Welwyn Hatfield Borough Council emerging Local Plan (January 2015)
[11] Stevenage Borough Local Plan 2011-2031. Publication draft – January 2016
[12] At time of writing the Corporation of London have commissioned an analysis of their existing visitor survey data which is likely to identify a requirement for further surveys to refine the recreational catchment of Epping Forest SAC
[13] Design Manual for Roads and Bridges, Volume 11, Section 3 Part 1 (HA207/07) and subsequent Interim Advice Notes, coupled with reference to Air Quality Technical Advisory Group (AQTAG) and Institute of Air Quality Management guidance

the predicted change in vehicle flows on roads within 200m of Epping Forest SAC and Lee Valley SPA/ Ramsar site as a result of the development Options identified within the HMA, with that which would be expected to occur anyway over time due to background population growth and delivery of existing consents.

2.4.2 Since vehicle exhausts are situated very close to the ground the emissions only have a local effect within a narrow band along the roadside, well within 200m of the centreline of the road. Beyond 200m emissions will have dispersed sufficiently that atmospheric concentrations are essentially background levels. The rate of decline is steeply curved rather than linear. In other words concentrations will decline rapidly as one begins to move away from the roadside, slackening to a more gradual decline over the rest of the distance up to 200m

Figure 2: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)



2.4.3 There are two measures of relevance regarding air quality impacts from vehicle exhausts. The first is the concentration of oxides of nitrogen (known as NOx) in the atmosphere. The main importance is as a source of nitrogen, which is then deposited on adjacent habitats (including directly onto the plants themselves) either directly from turbulence (known as dry deposition) or washed out in rainfall (known as wet deposition). The deposited nitrogen can then have a range of effects, primarily growth stimulation or inhibition[14], but also biochemical and physiological effects such as changes to chlorophyll content. NOx may also have some effects which are un-related to its role in total nitrogen intake (such as the acidity of the gas potentially affecting lipid biosynthesis) but the evidence for these effects is limited and they do not appear to occur until high annual concentrations of NOx are reached The guideline atmospheric concentration of NOx advocated by Government for the protection of vegetation is 30 micrograms per cubic metre (μgm^{-3}), known as the Critical Level. This is driven by the role of NOx in nitrogen deposition and in particular in growth stimulation and inhibition. If the total NOx concentration in a given area is below the critical level, it is unlikely that nitrogen deposition will be an issue unless there are other sources of nitrogen unrelated to the road (e.g. ammonia). If it is above the critical level then local nitrogen deposition from road traffic could be an issue and should be investigated.

2.4.4 The second important metric is a direct determination of the rate of the resulting nitrogen deposition. Unlike NOx in atmosphere, the nitrogen deposition rate below which we are confident effects would not arise is different for each habitat. The rate (known as the Critical Load) is provided on the UK Air Pollution Information System website (www.apis.ac.uk) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year ($kgNha^{-1}yr^{-1}$).

2.4.5 For completeness, rates of acid deposition have also been calculated. Acid deposition derives from both sulphur and nitrogen. It is expressed in terms of kiloequivalents (keq) per hectare per year. The thresholds against which acid deposition is assessed are referred to as the Critical Load Function. The principle is similar to that for a nitrogen deposition Critical Load but it is calculated very differently.

[14] The addition of nitrogen is a form of fertilization, which can have a negative effect on habitats over time by encouraging more competitive plant species that can force out the less competitive species that are more characteristic of such habitats.

2.4.6 Design Manual for Roads and Bridges and the Air Quality Technical Advisory Group guidance advises that where the concentration within the emission footprint [i.e. the Process Contribution (PC), the contribution of the scheme in question] in any part of the European site(s) is 1% of the relevant long-term benchmark (Critical Level or Critical Load) or less, the emission is 'inconsequential' (in the words of AQTAG) and 'imperceptible' (in the words of DMRB) and not likely to have a significant effect alone or in combination with other projects and plans irrespective of the background levels[15].

2.4.7 A series of road links within 200m of Epping Forest SAC and the Lee Valley SPA/ Ramsar site were identified for further investigation. Road links in proximity to European designated sites are identified in Table 2.

Table 2: Location of Road Links analysed within 200m of Epping Forest SAC and Lee Valley SPA/Ramsar site

Road Link	Ecological Site	Distance of Link from Designated Site
A121 (two sections)	Epping Forest SAC	Adjacent
A104	Epping Forest SAC	Adjacent
B1393	Epping Forest SAC	Adjacent
B172	Epping Forest SAC	Adjacent
Theydon Road	Epping Forest SAC	Adjacent
A414	Lee Valley SPA/ Ramsar site	25 metres

2.4.8 For each of these roads and each of the HMA Options, transport modellers calculated the following scenarios:

- Do Minimum (i.e. traffic flows expected by 2033, without new (i.e. currently unpermitted) development identified within the HMA)
- Do Something (i.e. traffic flows expected by 2033 with the level of new development identified within the HMA)

2.4.9 Annual Average Daily Traffic (AADT) for each of these link locations was modelled based AADT information gathered in 2014. This is referred to as the Base Case.

2.4.10 Using these Scenarios, and information on average vehicle speeds and percentage heavy duty vehicles (both of which influence the emissions profile), Air quality specialists calculated expected NOx concentrations, nitrogen deposition rates and acid deposition rates for those road links where traffic flows were forecast to increase as a result of the HMA options. For some road sections (particularly around Wake Arms Roundabout) multiple transects were modelled to account for the influence of the predominant wind direction and emissions from the other nearby road links. All Links pass immediately adjacent to the Epping Forest SAC, except for the A414 which at its closest is located 25m from Lee Valley SPA/ Ramsar site.

2.4.11 The difference between the Do Minimum and Do Something scenarios is the contribution of the HMA (and thus the four Local/District Plans taken collectively: East Herts, Epping Forest, Harlow and Uttlesford) since the difference between Do Minimum and Do Something reflects the effect the adoption of the Local/District Plans would have compared to the situation that would arise anyway due to background population growth across the region and delivery of existing planning permissions. This difference is essentially the Process Contribution (PC).

2.4.12 The predictions of nitrogen deposition and annual mean NO_X concentrations for the PC are based on the assessment methodology presented in Annex F of the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 (HA207/07)[16] for the assessment of impacts on sensitive designated ecosystems due to highways works. Background data for the predictions for 2033 were sourced from the Department of Environment, Food and Rural Affairs (Defra) background maps for

[15] Design Manual for Roads and Bridges Interim Advice Note (IAN) 174/13 (2013) Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07) states that '*Where the difference in concentrations* [between the Do Minimum and Do Something Scenarios] *are less than 1% of the air quality threshold then the change at these receptors is considered to be imperceptible and they can be scoped out of the judgement on significance*'.
AQTAG position regarding In-combination guidance and assessment. Correspondence between AQTAG and PINS. March 2015 states that: '*AQTAG is confident that a process contribution* [the difference between Do Minimum and Do Something Scenarios] *< 1% of the relevant critical level or load (CL) can be considered inconsequential and does not need to be included in an in-combination assessment*'

[16] Design Manual for Roads and Bridges, HA207/07, Highways Agency

2013 projected forward to 2033[17]. Background nitrogen deposition rates were sourced from the Air Pollution Information System (APIS) website[18].

2.4.13 Guidance note HA207/07 advises that background rates are reduced by 2% per year to allow for an improvement in background air quality over the Local/District Plan period (2033) as a result of ongoing national initiatives to improve emissions and the expected improvement in vehicle emissions over that period. However, due to the uncertainty in the rate with which projected future vehicle emission rates and background pollution concentrations are improving, the assumption has been made that conditions in 2023 (the midpoint between the base year and the year of assessment) are representative of conditions in 2033 (the year of assessment). This approach is accepted within the professional air quality community and accounts for known recent improvements in vehicle technologies (new standard Euro 6/VI vehicles), whilst excluding the more distant and therefore more uncertain projections on the future evolution of the vehicle fleet.

2.4.14 Annual mean concentrations of NOx were calculated at two 200m transects modelled at 1m, 10m, 20m, 50m, 100m, 150m, and 200m back from all Links except the A414 which was measured at 25m, 50m, 100m, 150m, 200m from the Link. Predictions were made using the latest version of ADMS-Roads using emission rates derived from the Defra Emission Factor Toolkit (version 6.0.2) which utilises traffic data in the form of 24-hour Annual Average Daily Traffic (AADT)[19], detailed vehicle fleet composition and average speed. The end of the Local/District Plan (2033) period has been selected for the future scenario as this is the point at which the total emissions due to Plan traffic will be at their greatest.

2.4.15 The tables in Appendix C and Appendix D present the calculated changes in NOx concentration, nitrogen deposition and acid deposition due to the modelled Options on each of the Links resulting from development from the HMA compared to that which would occur in any case over the Plan period (2033). In these tables 'Baseline' refers to the current (2014) baseline flows. The key column/row is that which shows the difference between the DM and DS Scenarios (Change) – this identifies the contribution of development provided in the HMA, i.e. the Process Contribution.

2.4.16 For NOx, if the numbers in the Change column fall on or below 0.3 μgm^{-3} (i.e. 1% of the generic Critical Level for vegetation of 30 μgm^{-3}) then impacts can be screened out without further discussion. For nitrogen deposition, if the numbers in this column fall on or below 0.1 $kgNha^{-1}yr^{-1}$ (1% of the lowest point in the Critical Load range) then it can also be screened out.

[17] Air Quality Archive Background Maps. Defra, 2013. Available from: http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

[18] Air Pollution Information System (APIS) www.apis.ac.uk

[19] Derived from Peak Flow data

3 Pathways of Impact

3.1 Introduction

3.1.1 In carrying out an HRA it is important to determine the various ways in which land use plans can impact on internationally designated sites by following the pathways along which development can be connected with internationally designated sites, in some cases many kilometres distant. Briefly defined, pathways are routes by which a change in activity associated with a development can lead to an effect upon an internationally designated site. Following screening of the Plan, the following impact pathways are considered within this document.

3.1.2 Impact pathways for consideration are:

- Disturbance from recreational activities
- Atmospheric pollution
- Water abstraction
- Water quality

3.2 Disturbance from Recreational Activities and Urbanisation

3.2.1 Recreational use of an internationally designated site has potential to:

- Cause damage through mechanical/ abrasive damage and nutrient enrichment;
- Cause disturbance to sensitive species, particularly ground-nesting birds and wintering wildfowl; and
- Prevent appropriate management or exacerbate existing management difficulties.

Recreational pressure

3.2.2 Different types of internationally designated sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex.

Mechanical/abrasive damage and nutrient enrichment

3.2.3 Most types of terrestrial internationally designated site can be affected by trampling, which in turn causes soil compaction and erosion. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and move more erratically. Motorcycle scrambling and off-road vehicle use can cause serious erosion, as well as disturbance to sensitive species.

3.2.4 There have been several papers published that empirically demonstrate that damage to vegetation in woodlands and other habitats can be caused by vehicles, walkers, horses and cyclists:

- Wilson & Seney (1994)[20] examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
- Cole et al (1995a, b)[21] conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow and grassland communities (each tramped between 0 – 500 times) over five

[20] Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off road bicycles on mountain trails in Montana. *Mountain Research and Development* 14:77-88

[21] Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* 32: 203-214

mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. Cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks, but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.

- Cole (1995c)[22] conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampler weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier tramplers caused a greater reduction in vegetation height than lighter tramplers, but there was no difference in effect on cover.
- Cole & Spildie (1998)[23] experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse traffic was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance, but recovered rapidly. Higher trampling intensities caused more disturbance.

3.2.5 The total volume of dog faeces deposited on sites can be surprisingly large. For example, at Burnham Beeches National Nature Reserve over one year, Barnard[24] estimated the total amounts of urine and faeces from dogs as 30,000 litres and 60 tonnes respectively. The specific impact on Epping Forest has not been quantified from local studies; however, the fact that habitats for which the SAC is designated appear to be subject already to excessive nitrogen deposition, suggests that any additional source of nutrient enrichment (including uncollected dog faeces) will make a cumulative contribution to overall enrichment. Any such contribution must then be considered within the context of other recreational sources of impact on sites.

Disturbance

3.2.6 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[25]. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately the survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds[26].

3.2.7 The potential for disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. In addition, the consequences of disturbance at a population level may be reduced because birds are not breeding. However, winter activity can still cause important disturbance, especially as birds are particularly vulnerable at this time of year due to food shortages, such that disturbance which results in abandonment of suitable feeding areas through disturbance can have severe consequences. Several empirical studies have, through correlative analysis,

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Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* 32: 215-224

[22] Cole, D.N. (1995c) Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah

[23] Cole, D.N., Spildie, D.R. (1998) Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* 53: 61-71

[24] Barnard, A. (2003) Getting the Facts - Dog Walking and Visitor Number Surveys at Burnham Beeches and their Implications for the Management Process. *Countryside Recreation*, 11, 16 - 19

[25] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

[26] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

demonstrated that out-of-season (October-March) recreational activity can result in quantifiable disturbance:

- Underhill et al[27] counted waterfowl and all disturbance events on 54 water bodies within the South West London Water bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas.
- Evans & Warrington[28] found that on Sundays total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire, and attributed this to displacement of birds resulting from greater recreational activity on surrounding water bodies at weekends relative to week days.
- Tuite et al[29] used a large (379 site), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They found that on inland water bodies shoveler was one of the most sensitive species to disturbance. The greatest impact on winter wildfowl numbers was associated with sailing/windsurfing and rowing.
- Pease et al[30] investigated the responses of seven species of dabbling ducks to a range of potential causes of disturbance, ranging from pedestrians to vehicle movements. They determined that walking and biking created greater disturbance than vehicles and that gadwall were among the most sensitive of the species studied.
- In a three-year study of wetland birds at the Stour and Orwell SPA, Ravenscroft[31] found that walkers, boats and dogs were the most regular source of disturbance. Despite this, the greatest responses came from relatively infrequent events, such as gun shots and aircraft noise Birds seemed to habituate to frequent 'benign' events such as vehicles, sailing and horses, but there was evidence that apparent habituation to more disruptive events related to reduced bird numbers – i.e. birds were avoiding the most frequently disturbed areas. Disturbance was greatest at high tide and on the Orwell, but birds on the Stour showed greatest sensitivity.

3.2.8 A number of studies have shown that birds are affected more by dogs and people with dogs than by people alone, with birds flushing more readily, more frequently, at greater distances and for longer. In addition, dogs, rather than people, tend to be the cause of many management difficulties, notably by worrying grazing animals, and can cause eutrophication near paths. Nutrient-poor habitats such as heathland are particularly sensitive to the fertilising effect of inputs of phosphates, nitrogen and potassium from dog faeces[32] .

3.2.9 Underhill-Day[33] summarises the results of visitor studies that have collected data on the use of semi-natural habitat by dogs. In surveys where 100 observations or more were reported, the mean percentage of visitors who were accompanied by dogs was 54.0%.

3.2.10 However the outcomes of many of these studies need to be treated with care. For instance, the effect of disturbance is not necessarily correlated with the impact of disturbance, i.e. the most easily disturbed species are not necessarily those that will suffer the greatest impacts. It has been shown that, in some cases, the most easily disturbed birds simply move to other feeding sites, whilst others may remain (possibly due to an absence of alternative sites) and thus suffer greater impacts on their

[27] Underhill, M.C. *et al.* 1993. Use of Waterbodies in South West London by Waterfowl. An Investigation of the Factors Affecting Distribution, Abundance and Community Structure. Report to Thames Water Utilities Ltd. and English Nature. Wetlands Advisory Service, Slimbridge

[28] Evans, D.M. & Warrington, S. 1997. The effects of recreational disturbance on wintering waterbirds on a mature gravel pit lake near London. International Journal of Environmental Studies 53: 167-182

[29] Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62

[30] Pease, M.L., Rose, R.K. & Butler, M.J. 2005. Effects of human disturbances on the behavior of wintering ducks. *Wildlife Society Bulletin* 33 (1): 103-112.

[31] Ravenscroft, N. (2005) Pilot study into disturbance of waders and wildfowl on the Stour-Orwell SPA: analysis of 2004/05 data. Era report 44, Report to Suffolk Coast & Heaths Unit.

[32] Shaw, P.J.A., K. Lankey and S.A. Hollingham (1995) – Impacts of trampling and dog fouling on vegetation and soil conditions on Headley Heath. *The London Naturalist*, **74**, 77-82.

[33] Underhill-Day, J.C. (2005). A literature review of urban effects on lowland heaths and their wildlife. Natural England Research Report 623.

population[34] . A literature review undertaken for the RSPB[35] also urges caution when extrapolating the results of one disturbance study because responses differ between species and the response of one species may differ according to local environmental conditions. These facts have to be taken into account when attempting to predict the impacts of future recreational pressure on internationally designated sites.

3.2.11 Disturbing activities are on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration (such as those often associated with construction activities). Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.

3.2.12 The factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.

3.2.13 It should be emphasised that recreational use is not inevitably a problem. Many internationally designated sites are also nature reserves managed for conservation and public appreciation of nature. The Lee Valley Regional Park that encompasses the SPA and Ramsar sites is such an example. At these sites, access is encouraged and resources are available to ensure that recreational use is managed appropriately.

3.2.14 The Lee Valley SPA and Ramsar site and Wormley-Hoddesdonpark Woods SAC lie within the District boundary, whilst Epping Forest SAC is located 10km from the District boundary. As such they are theoretically vulnerable, to the effects of recreational pressure and/ or disturbances from construction activities resulting from development within East Herts.

3.2.15 It is therefore necessary to perform an initial screening exercise to determine whether the District Plan contains policy measures that could lead to a likely significant effects, either alone or 'in combination' with other plans and projects, through recreational pressure, on these internationally designated sites.

[34] Gill et al. (2001) - Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation,* **97**, 265-268

[35] Woodfield & Langston (2004) - Literature review on the impact on bird population of disturbance due to human access on foot. *RSPB research report* No. 9.

Urbanisation

3.2.16 This impact is closely related to recreational pressure, in that they both result from increased populations within close proximity to sensitive sites. Urbanisation is considered separately as the detail of the impacts is distinct from the trampling, disturbance and dog-fouling that results specifically from recreational activity. The list of urbanisation impacts can be extensive, but core impacts can be singled out:

- Increased fly-tipping - Rubbish tipping is unsightly but the principle adverse ecological effect of tipping is the introduction of invasive non-native species with garden waste. Non-native species can in some situations, lead to negative interactions with habitats or species for which internationally designated sites may be designated. Garden waste results in the introduction of invasive non-native species precisely because it is the 'troublesome and over-exuberant' garden plants that are typically thrown out[36]. Non-native species may also be introduced deliberately or may be bird-sown from local gardens.
- Cat predation - A survey performed in 1997 indicated that nine million British cats brought home 92 million prey items over a five-month period[37]. A large proportion of domestic cats are found in urban situations, and increasing urbanisation is likely to lead to increased cat predation

3.2.17 The most detailed consideration of the link between relative proximity of development to internationally designated sites and damage to interest features has been carried out with regard to the Thames Basin Heaths SPA.

3.2.18 After extensive research, Natural England and its partners produced a 'Delivery Plan' which made recommendations for accommodating development while also protecting the interest features of the internationally designated site. This included the recommendation of implementing a series of zones within which varying constraints would be placed upon development. While the zones relating to recreational pressure expanded to 5km (as this was determined from visitor surveys to be the principal recreational catchment for this internationally designated site), that concerning other aspects of urbanisation (particularly predation of the chicks of ground-nesting birds by domestic cats) was determined at 400m from the SPA boundary. The delivery plan concluded that the adverse effects of any development located within 400m of the SPA boundary could not be mitigated since this was the range over which cats could be expected to roam as a matter of routine and there was no realistic way of restricting their movements, and as such, no new housing should be located within this zone.

3.2.19 As such, screening is undertaken to determine whether the Plan could lead to likely significant effects upon Lee Valley internationally designated site, either alone or 'in combination' with other plans and projects, through impacts of urbanisation. This uses the 400m precedent as an indicator that urbanisation may be a consideration.

3.3 Atmospheric Pollution

3.3.1 This impact pathway has already been discussed in some detail in order to explain the assessment methodology. The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

Table 3: Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO_2, NOx and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased N emissions may cancel out any gains produced	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.

[36] Gilbert, O. & Bevan, D. 1997. The effect of urbanisation on ancient woodlands. British Wildlife 8: 213-218.
[37] Woods, M. et al. 2003. Predation of wildlife by domestic cats Felis catus in Great Britain. Mammal Review 33, 2 174-188

Pollutant	Source	Effects on habitats and species
	by reduced S levels.	
Ammonia (NH_3)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4+) - containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO_x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) can lead to both soil and freshwater acidification. In addition, NO_x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO_X and NH_3 emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions from NO_x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.
Sulphur Dioxide SO_2	Main sources of SO_2 emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO_2 emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

3.3.2 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil. Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NOx (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[38]. Emissions of NOx could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the plan.

[38] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php

3.4 Water abstraction

3.4.1 The East of England is generally an area of high water stress.

3.4.2 The East of England is particularly vulnerable to climate change now and in the future. It is already the driest region in the country and the predicted changes will affect the amount and distribution of rainfall, and the demand for water from all sectors. The average natural summer flows of rivers could drastically reduce; the period where groundwater resources are replenished could be shorter; and resources could become much more vulnerable. By 2050, climate change could reduce water resources by 10 -15% on an annual average basis, and reduce summer river flows by 50 -80%. Drought and floods may become more frequent in the future. The reliability of existing reservoirs, groundwater extractions and river intakes will change. Some infrastructure that is critical for providing water supplies may be more vulnerable to flooding. The delivery of housing and economic development throughout the region could therefore result in adverse effects on many internationally designated sites in the region including those listed in preceding sections.

3.4.3 The most recent full CAMS assessment for the Upper Lee found that the Management Unit for Rivers Lee, Mimram, Beane, Ash, Rib and Upper Stort was over-abstracted. Rye Meads SSSI component of the Lee Valley SPA/Ramsar site is situated within East Herts and is particularly sensitive to high levels of freshwater abstraction (resulting in a reduction in water levels within the SPA).

3.4.4 East Herts lies within the Affinity Water supply area, specifically their Central region, within WRZ 3 and 5. Approximately 60% of the Central region's water supply comes from groundwater sources (chalk and gravel aquifers) and 40% comes from surface water sources and imports from neighbouring water

3.5 Water quality

3.5.1 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

3.5.2 At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.

- Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

3.5.3 Sewage and some industrial effluent discharges contribute to increased nutrients in the European sites and in particular to phosphate levels in watercourses.

4 Initial Policy Sift

4.1.1 The tables below present an initial sift of policies and allocations within the District Plan, from the point of view of HRA.

Table 4: Screening assessment of Policies, other than those which make new site allocations (these are covered in Table 5)

Policy	Policy summary	HRA implications
Policy INT1 Presumption in Favour of Sustainable Development	This is a development management policy relating to sustainable development including reference to securing development that improves the economic, social and environmental conditions in the area, the requirement for development to accord with this Plan	No HRA implications. This is a development management policy providing for sustainable development. By definition sustainable development will not result in likely significant effects.
Policy DPS1 Housing, Employment and Retail Growth	Between 2011 and 2033 the council will provide a minimum of 16,390 new homes. Aims to achieve a minimum of 438-505 additional jobs each year (up to 11,110 over the plan period). Provide 10-11 hectares of new employment land for B1 (business)/B2 (general industry)/B8 (storage and distribution) uses. Encourage an additional 7,600m^2 of convenience and 6,100m^2 of comparison retail floorspace.	This policy provides for both residential and employment focused development. Potential HRA implications depending on the specific sites allocated.
Policy DPS2 The Development Strategy 2011-2033	Provides for the requirement of 16,390 new homes to 2033. Outlines the phasing requirement for new housing with 6,041 new houses required between 2017-2022. Prioritising brownfield sites in towns for mixed-use development, with the reaming housing need provided on greenfield sites. Development in the villages shall be delivered in accordance with local initiatives led by Parish Councils	This policy provides for residential development. Potential HRA implications depending on the specific sites allocated.
Policy DPS3 Housing Supply 2011-2033	The overall housing supply will meet projected housing need over the plan period 2011 to 2033.	This policy provides for both residential and employment focused development. Potential HRA implications depending on the specific sites allocated.
Policy DPS4 Infrastructure Requirements	Provides for appropriate phasing of development to ensure that infrastructure capacity is provided and 'impacts are satisfactorily mitigated in a timely manner'. Provides for the requirement of the following strategic infrastructure development: (a) a new Junction 7a on the M11; (b) upgrades to Junction 7 and 8 of the M11; (c) widening of the existing River Stort crossing, and provision of a second crossing; (d) improvements to the A414 through Hertford; (e) the Little Hadham bypass; (f) upgrades to the A602; (g) upgrades to the rail network;	No HRA implications. This policy does provide for new infrastructure schemes that could provide impact pathways that link to internationally designated sites. The levels of detail required to undertake HRA of these schemes is not available at this stage, although transport improvement schemes have been factored into air quality modelling mentioned later in this report. Until these schemes are devised it is not possible to undertake screening of impact pathways relating to these schemes. However, where required HRA, of these schemes will be undertaken to ensure at the project level that no likely significant effect result. This provision is included in Policy NE1 (International, National and Locally Designated Nature Conservation Sites).

	(h) new schools and the expansion of existing schools; (i) healthcare facilities; (j) broadband telecoms; and (k) upgrades to waste water and water supply networks. Identifies how financial contributions will be secured.	
Policy DPS5 Review of the District Plan	This provides for the review of the District Plan under a variety of circumstances.	No HRA implications. This is a Plan management policy relating to its review.
Policy DPS6 Neighbourhood Planning	This policy supports development brought forward through Neighbourhood Development Plans in principal. It ensures that this development is in line with other policies within the Plan	No HRA implications. This policy supports development in accordance with other strategic documents, provided it is in-line with this Plan. It does not identify any quantum, location or type of development.
Policy GBR1 Green Belt	Provides for planning in the Green Belt to be in-line with the NPPF. Provides for the potential to amend the Green Belt boundary around Hertford Heath, Stanstead Abbotts & St Margarets, and Watton-at-Stone.	No HRA implications This is a development management policy relating to the Green belt.
Policy GBR2 Rural Area Beyond the Green Belt	Within the Rural Area Beyond the Green-Belt the Council will consider new buildings inappropriate with exceptions listed. Exceptions include: agricultural and forestry buildings; appropriate facilities for outdoor sport, outdoor recreation, including equine development, and for cemeteries; extensions and alterations to buildings; replacement of existing buildings; limited infilling; rural exception housing in line with Policy HOU$ (Rural Exception Affordable Housing Sites); accommodation for Gypsies and Travellers and Travelling Showpeople in accordance with Policy HOU9 (Gypsies and Travellers and Travelling Showpeople); development identified in the adopted Neighbourhood Plan; mining extraction; engineering operations; local transport infrastructure; re-use of buildings, and development brought forward under a Community Right to Build Order in accordance with Policy DPS6 (Neighbourhood Planning).	No HRA implications This is a development management policy relating to the Rural Area Beyond the Green-Belt. Whilst it does provide for development types that have potential to result in impact pathways linking to internationally designated sites, no location, or extent of development is identified and there is not sufficient detail of any type of development to undertake screening at this stage. Where required, HRA of these projects would be undertaken to ensure that no likely significant effect result. This provision is included in Policy NE1 (International, National and Locally Designated Nature Conservation Sites).
Policy BISH2 Bishop's Stortford Town Centre Planning Framework	Development proposals in Bishop's Stortford Town Centre will be expected to conform with, and positively contribute to, proposals contained within the Bishop's Stortford Town Centre Planning Framework, as appropriate.	No HRA implications. This is simply a development management policy referring to the Town Centre Planning Framework
Policy BISH11: Employment in Bishop's Stortford	I. In accordance with Policy ED1 (Employment), the following locations are designated as Employment Areas: (a) Raynham Road/Dunmow Road Industrial Estate (incorporating Stortford Hall Industrial Estate, The Links Business Centre, Raynham Road/Myson Way, Raynham Road West, and Raynham Road East between The Links Business Centre and Raynham Close); (b) Haslemere Estate; (c) Twyford Road; (d) Stansted Road (incorporating Goodliffe Park, Stort Valley Industrial Estate,	HRA implications Employment development can potentially lead to likely significant effects on European sites, mainly through air quality, water quality or water resource impacts. Much of this policy does not allocate any new employment sites but rather formally designates several existing areas as formal Employment Areas. However, the policy also proposes to create new employment sites or

	and Birchanger Industrial Estate); (e) Woodside; (f) Millside Industrial Estate; (g) Southmill Trading Estate. II. New Employment Areas will be identified in the following locations: (a) Bishop's Stortford North, as set out in Policy BISH3; (b) Bishop's Stortford South, as set out in Policy BISH5. III. New employment opportunities will come forward through mixed-use development at the following locations: (a) The Goods Yard, as set out in Policy BISH7; and (b) Old River Lane, as set out in Policy BISH8. IV. The Mill Site in Bishop's Stortford will remain as a designated Employment Area until such time that the land is presented as being available for redevelopment. The site will then be subject to the provisions of Policy BISH10 and should be brought forward for redevelopment as part of a comprehensive masterplan.	areas at Bishops Stortford North, Bishops Stortford South, The Goods Yard and Old River Lane. Each of these sites is considered in Table 5. The Mill Site is an existing employment area but is discussed as a potential long-term housing site in Table 5.
Policy BISH12: Retail, Leisure and Recreation in Bishop's Stortford	I. New retail and leisure facilities will be focused within the town centre and within the following locations: (a) the Old River Lane site, in accordance with Policy BISH7; (b) the Mill Site, in accordance with BISH9; and (c) the Goods Yard, in accordance with Policy BISH4. II. Development proposals in Bishop's Stortford should seek to enhance the public realm and create connections between existing and new retail and leisure facilities, including the Rhodes Centre. III. Opportunities to link into and extend the pedestrian circuit will be supported in principle and proposals that jeopardise such connections will be resisted. IV. To provide for day-to-day convenience retail and service needs, new Neighbourhood Centres will be designated in the following locations: (a) Bishop's Stortford North, west of Hoggate's Wood, in accordance with Policy BISH2 (I); (b) Bishop's Stortford North, between Hoggate's Wood and Farnham Road, in accordance with Policy BISH2 (II). (c) Bishop's Stortford South, in accordance with Policy BISH3; V. Opportunities to provide new indoor and outdoor sports facilities will be supported in principle in accordance with Policy CFLR1 V. The Green Wedges in Bishop's Stortford are designated as Local Green Spaces, within which Policy CFLR2 (Local Green Space) applies.	HRA implications This policy identifies new retail and leisure facilities or Neighbourhood Centres to be located on the Old River Lane Site, the Mill Site, the Goods Yard, Bishops Stortford North and Bishops Stortford South. Each of these sites is considered in Table 5.
Policy BUNT1 Development in Buntingford	In accordance with Policy DPS3 (Housing Supply 2011-2033), development proposals will be permitted within the town boundary as defined on the Policies Map, which will include: (a) a proportion of the overall windfall allowance for the District.	HRA implications, in as much as it identifies housing delivery in Buntingford
Policy BUNT3 Employment in	I. In accordance with Policy ED1 (Employment), the following locations are designated as Employment Areas:	HRA implications

Buntingford	(a) Park Farm; (b) Buntingford Business Park; (c) Watermill Industrial Estate (reserved for B1, B2 and small-scale B8 uses); (d) London Road Employment Area (reserved for B1(a), B1(c) and/or D1 uses). II. In addition, 3 hectares of land located to the north of Buntingford Business Park has been allocated as an extension to the existing Employment Area.	Employment development can potentially lead to likely significant effects on European sites, mainly through air quality, water quality or water resource impacts. Much of this policy does not allocate any new employment sites but rather formally designates several existing areas as formal Employment Areas. However, the policy also proposes to create a new employment site to the north of Buntingford. This site is considered in Table 5.
Policy HERT6 Employment in Hertford	I. In accordance with Policy ED1 (Employment), the following locations are designated as Employment Areas: (a) Caxton Hill; (b) Foxholes Business Park; (c) Hartham Lane; (d) Mead Lane - East of Marshgate Drive (including the provisions of the Mead Lane Urban Development Framework); (e) Mimram Road; (f) Warehams Lane; (g) Windsor Industrial Estate, Ware Road. II. In addition, in accordance with Policy ED1 (Employment), the following location is designated as an Employment Area reserved primarily for B1 use: (a) Pegs Lane.	No HRA implications Employment development can potentially lead to likely significant effects on European sites, mainly through air quality, water quality or water resource impacts. However, this policy does not allocate any new employment sites but rather formally designates several existing areas as formal Employment Areas.
Policy HERT7 Hertford Town Centre Urban Design Strategy	Development proposals in Hertford Town Centre will be expected to conform with, and positively contribute to, proposals contained within the Hertford Town Centre Urban Design Strategy, as appropriate.	No HRA implications. This is simply a development management policy referring to the Town Centre Urban Design Strategy
Policy SAWB5 Sports Pitch Provision	Allocation for sports pitches	No HRA implications. This allocates 14 hectares to the north of Leventhorpe School for sports pitches.
Policy WARE3 Employment in Ware	In accordance with Policy ED1 (Employment), the following locations are designated as Employment Areas: (a) Broadmeads; (b) Crane Mead; (c) Ermine Point/Gentlemen's Field*;	No HRA implications Employment development can potentially lead to likely significant effects on European sites, mainly through air quality, water quality or water resource impacts. However, this policy does not allocate any

	(d) Marsh Lane; (e) Park Road/Harris's Lane; (f) Star Street; and As per policy WARE2	new employment sites but rather formally designates several existing areas as formal Employment Areas.
Policy GA2 The River Stort Crossings	The Council will work with key stakeholders including Hertfordshire County Council, Essex County Council, Harlow Council, Hertfordshire LEP, and others as appropriate, to facilitate the delivery of the following transport improvements to crossings of the River Stort: A widening of the existing A414 crossing to enable a dualling of the northbound and southbound carriageways and provision of a new footway/cycleway, which will form part of a north-south sustainable transport corridor through Harlow; and A new vehicular, cycle and pedestrian crossing either to the east of the existing crossing (connecting the A414 to the River Way), or to the west of the existing crossing (connecting the A414 to Elizabeth Way).	No HRA implications. The River Stort is not connected to any European sites.
Policy HOU1 Type and Mix of Housing	Development management policy providing guidance relating to type and mix of new housing provision. Includes affordable housing, specialist housing, accessible and adaptable dwellings, self-buiild housing, accommodation for Gypsies and Travellers and Travelling Showpeople,	No HRA implications. A development management policy relating to type and mix of housing. It does not provide any location or quantum of housing.
Policy HOU2 Housing Density	A development management policy relating to housing density. Includes reference to effective use of land, design objectives, and adequate levels of public open space.	No HRA implications. A development management policy relating to housing density. It does not provide any location or quantum of housing.
Policy HOU3 Affordable Housing	A development management policy relating to affordable housing.	No HRA implications. A development management policy relating to affordable housing. It does not provide any location or quantum of housing
Policy HOU4 Rural Exception Affordable Housing Sites	A development management policy providing for rural exception affordable housing sites.	No HRA implications. A development management policy providing for rural exception affordable housing sites. It does not identify any location for development. It is assumed that rural exceptions would provide for a small number of new dwellings.
Policy HOU5 Dwellings for Rural Workers	A development management policy providing for dwellings for rural workers.	No HRA implications. A development management policy providing for dwellings for rural workers. It does not identify any location for development. It is assumed that this policy would provide for a small number of new dwellings.
Policy HOU6 Specialist Housing for Older	A development management policy providing for specialist housing for older and vulnerable people. It also provides for 530bed-spaces to help meet accommodation needs.	No HRA implications. This policy provides for 530 new bed-spaces for vulnerable and older

and Vulnerable People		people. It is assumed that occupants will have restricted mobility and as such would not contribute to recreational pressure or reduced air quality.
Policy HOU7 Accessible and Adaptable Homes	A development management policy providing for accessible and adaptable homes.	No HRA implications. A development management policy providing for accessible and adaptable homes. It does not identify any quantum, or location for development. There are no impact pathways present.
Policy HOU8 Self-Build Housing	A development management policy relating to the provision of self-build homes.	No HRA implications. This is a development management policy relating to the provision of self-build homes. It does not identify any quantum, or location for development There are no impact pathways present.
Policy HOU10 New Park Home Sites for Non-Nomadic Gypsies and Travellers and Travelling Showpeople	This is a development management policy relating to the provision of New Park Home Sites for Non-Nomadic Gypsies and Travellers and Travelling Showpeople.	No HRA implications. This is a development management policy relating to the provision of New Park Home Sites for Non-Nomadic Gypsies and Travellers and Travelling Showpeople. It does not provide any location or quantum of development.
Policy HOU11 Extensions and Alterations to Dwellings, Residential Outbuildings and Works Within Residential Curtilages	This is a development management policy relating to proposals for extensions and alterations to dwellings; residential outbuildings or extensions to existing outbuildings; and works within residential curtilages.	No HRA implications. This is a development management policy relating to proposals for extensions and alterations to dwellings; residential outbuildings or extensions to existing outbuildings; and works within residential curtilages. It does not provide any location for development. It is assumed that this policy is likely to result in a small increase in residential provision.
Policy HOU12 Change of Use of Land to Residential Garden and Enclosure of Amenity Land	This is a development management policy relating to change of land use to residential garden and enclosure of amenity land. It states that the Council will seek to ensure the retention of amenity land/ open space. Landscaped areas around housing development and planning permission for the enclosure of such land into gardens will not usually be given.	No HRA implications. This is a positive development management policy that aims to retain public access to public land, which could potentially divert recreational pressure away from an internationally designated site.
Policy HOU13 Residential Annexes	This is a development management policy relating to residential annexes.	No HRA implications. This is a development management policy relating to residential annexes. It does not provide any location or quantum of development. It is assumed that this could result in a small increase in bed-spaces. Due to the anticipated very small scale of development, there are no impact pathways present.
Policy ED1	Reservation of land for industry comprising Use Classes B1 (Business), B2	This policy provides for employment focused development. Potential

Employment	(General Industrial) and where well related to the primary road network, B8 (Storage and Distribution). Within Employment Areas. Support of new employment uses in principle providing they are in a suitable location where access can be achieved by a choice of sustainable transport and do not conflict with other policies within this Plan. New employment floorspace should be energy efficient in construction and operation and have a fully integrated communications technology. Loss of an existing designated Employment Area will only be permitted under certain criteria The Mill Site in Bishop's Stortford will remain as a designated Employment Area until such time that the land is presented as being available for redevelopment. The site will then be subject to the provisions of Policy BISH2	HRA implications depending on the specific sites allocated.
Policy ED2 Rural Economy	Support sustainable economic growth in rural areas and proposals that create new employment generating uses or support the sustainable growth and expansion of existing businesses in the rural area will be supported in principle where they are appropriately and sustainably located and do not conflict with other policies within this Plan.	No HRA implications. This policy supports in principle sustainable economic growth and expansion in rural areas where they are appropriately and sustainably located and do not conflict with other policies within this Plan. This has potential to result in impact pathways linking to internationally designated sites. However, by definition sustainable development will not impact upon designated sites. Further, this policy does not provide any quantum or location of employment lead development. Whilst potential impact pathways are present such as linkages to atmospheric pollution, and recreational pressure, as this policy will be in-line with other policies of the Plan such as Policy NE1 (International, National and Locally Designated Nature Conservation Sites), it can be considered that this policy can be screened out.
Policy ED3 Communications Infrastructure	Provision or expansion of electronic communications networks, including high-speed broadband is supported in principle. This includes the provision of masts and visible structures.	No HRA implications. This is effectively a development management policy relating to the provision of communications infrastructure. Increased/ improved communications infrastructure has potential to result in the need for less journeys to be taken, resulting in an improvement in air quality, thus having a positive impact. This policy does however provide for communications masts which could impact upon Lee Valley SPA/ Ramsar site through collision risks depending on location of the masts. However, this policy does not provide any project details specific to this type of development so it is not possible to screen this impact at this stage, further Policy NE1 (International, National and Locally Designated Nature Conservation Sites).provides protection designated sites.

Policy ED4 Flexible Working Practices	Supports small-scale business purposes in dwellings in principle with development management criteria.	No HRA implications. This is a development management policy relating to small-scale development and flexible working practices. It does not provide any location, type or quantum of development. Due to the 'small-scale' of any development relating to this policy, it is likely that any development in-line with this policy would result in a perceptible impact. There are no realistic impact pathways present.
Policy ED5 Tourism	New tourism enterprises and extensions to existing tourism enterprises will be supported in principle where the facility meets identified needs which are not met by existing facilities, are appropriately located and do not conflict with other policies within this Plan. With regards to water-based facilities and development within environmentally sensitive area, no harm will occur to the quality of the environment and the health of the wildlife in line with the provisions of Policy CFLR4 (Water Based Recreation), Policy NE1 (International, National and Locally Designated Nature Conservation Sites) Policy NE2 (Species and Habitats)	Potential HRA implications. However, this policy ensures that no harm will occur to sensitive areas via the direct reference Policy NE1 (International, National and Locally Designated Nature Conservation Sites) which provides explicate protection for internationally designated sites.
Policy ED6 Lifelong Learning	This policy supports the provision of new educational establishments which support a range of learning and community needs such as further education and opportunities for lifelong learning will be supported in principle	No HRA implications. This is a development management policy relating to lifelong learning. No quantum, location or type of development is provided.
Policy RTC1 Retail Development	Main town centre uses will be supported in principle, where they contribute to maintaining the role and function, viability and vitality of the market town. The requirement for proposals for retail, leisure and office developments to provide an impact assessment. This policy provides further details relating to this requirement. The policy provides thresholds identifying the classification of major schemes within different settlements.	No HRA implications This is a development management policy relating to retail development. This policy does not provide any quantum or location of retail development. As such there are no impact pathways present.
Policy RTC2 Primary Shopping Area	This is a development management policy relating to Primary Shopping areas in Bishop's Stortford, Hertford and Ware.	No HRA implications. This is a development management policy relating to Primary Shopping areas in Bishop's Stortford, Hertford and Ware.
Policy RTC3 Primary Shopping Frontages	To protect the vitality and viability of the Primary Shopping Areas, within the Primary Shopping Frontages in Bishop's Stortford, Hertford and Ware, as defined on the Policies Map, proposals for Use Class A1 (shops) will be supported in principle as the preferred use, while Use Classes A1, A2 (financial and professional services), A3 (restaurants and cafes), A4 (drinking establishments) and A5 (hot food takeaways) will be supported in principle provided they have an active frontage and there remains an adequate provision of A1 and A2 uses which support its role as a Primary Shopping Frontage.	No HRA implications. This is a development management policy providing for the protection of Primary Shopping Areas. It does not provide any location or quantum of development.
Policy RTC4 Secondary Shopping Frontages	Within the Secondary Shopping Frontages in Bishop's Stortford, Buntingford, Hertford, Sawbridgeworth and Ware, proposals for development or changes of use to main town centre uses or those that will support the vitality and viability of the frontage or town centre as a whole (such as employment generating or	No HRA implications. This is a development management policy relating to Secondary Shop Frontages in Bishop's Stortford, Buntingford, Hertford, Sawbridgeworth

	activity generating uses) will be supported in principle.	and Ware. It does not provide any location or quantum of development.
Policy RTC5 District Centres, Neighbourhood Centres, Local Parades and Individual Shops	A development management policy supporting development or change of use to main town centre uses to District Centres, Neighbourhood Centres and Local Parades.	No HRA implications. This is a development management policy relating to District Centres, Neighbourhood Centres and Local Parades and individual shops. It does not identify any location, quantum or type of development.
Policy DES1 Landscape Character	Development proposals must demonstrate how they conserve, enhance or strengthen the character and distinctive features of the district's landscape. For major applications, or applications where there is a potential adverse impact on landscape character, a Landscape and Visual Impact Assessment and/or Landscape Sensitivity and Capacity Assessment should be provided to ensure that impacts, mitigation and enhancement opportunities are appropriately addressed. This policy provides the requirement for mitigation if damage to landscape character is unavoidable. Reference to the use of the Council's latest Landscape Character Assessment SPD.	No HRA implications. This is a development management policy relating to landscape character.
Policy DES2 Landscaping	Development proposals must demonstrate how they will retain, protect and enhance existing landscape features which are of amenity and/or biodiversity value. This policy provides the requirement for mitigation if damage to landscape character is unavoidable.	No HRA implications. This is a development management policy relating to landscaping.
Policy DES3 Design of Development	All development proposals, including extensions to existing buildings, must be of a high standard of design and layout to reflect and promote local distinctiveness. This policy provides further guidance relating to many aspects of design considerations.	No HRA implications. This is a development management policy relating to design.
Policy DES4 Crime and Security	This policy provides for reducing the opportunity for crime and the design of security features.	No HRA implications. This is a development management policy relating to crime and security. This is a positive policy as it has potential to reduce fly-tipping and vandalism within internationally sensitive habitats.
Policy DES5 Advertisements and Signs	This is a development management policy relating to advertisements and signs.	No HRA implications. This is a development management policy relating to advertisements and signs.
Policy TRA1 Sustainable Transport	To achieve accessibility improvements and promotion of sustainable transport in the district, development proposals should: be located in places which enable sustainable journeys to be made to key services and facilities to help aid carbon emission reduction; Ensure that a	No HRA implications. This is a development management policy relating to the provision of sustainable transport, which can improve air quality. This policy does

	range of sustainable transport options are available to occupants or users, which may involve the improvements; site layouts prioritise the provision of modes of transport other than the car; in the construction of major schemes, allow for the early implementation of sustainable travel infrastructure or initiatives; protect existing rights of way, cycling and equestrian routes; ensure that provision for the long-term maintenance of any of the above measures. This may require financial contributions; and comply with the provisions of the Local Transport Plan and/or Hertfordshire 2050 Transport Vision.	not identify any specific scheme, location, type or quantum of development. By definition sustainable development should not result in likely significant effect. This is a positive policy as it promotes and encourages the use of sustainable transport methods that have potential to result in a reduction in emissions of air pollutants.
Policy TRA2 Safe and Suitable Highway Access Arrangements and Mitigation	Development proposals should ensure that safe and suitable access can be achieved for all users. Site layouts, access proposals and any measures designed to mitigate trip generation produced by the development should: be acceptable in highway safety terms; not result in any severe residual cumulative impact; and not have a significant detrimental effect on the character of the local environment.	There are no HRA implications. This is a development management policy relating to safe and suitable highway access arrangements and mitigation.
Policy TRA3 Vehicle Parking Provision	This is a development management policy relating to parking provision.	No HRA implications. This is a development management policy relating to parking provision.
Policy CFLR1 Open Space, Sport and Recreation	Residential developments will be expected to provide on-site open spaces, indoor and outdoor sport and recreation facilities to provide for the needs arising from the development. Contributions towards off-site provision or the enhancement of existing facilities may be more appropriate for other types of provision. Facilities should be provided in accordance with the Council's latest evidence and in consultation with Sport England and the Council's Leisure and Environment Team. Where provision is made on-site as part of a development, applicants should detail how it will be maintained in the long term. Proposals for new open space, indoor and outdoor sport and recreation facilities which meet identified needs will be encouraged in suitable locations, served by a choice of sustainable travel options. Measures should be taken to integrate facilities into the landscape providing net benefits to biodiversity. This policy supports the retention and enhancement of existing open space, or indoor or outdoor sport and recreation facilities in principle, where they do not conflict with other policies within this Plan. Proposals that result in the loss or reduction of open space, indoor or outdoor sport and recreation facilities, including playing fields, will be refused unless certain criteria are met.	No HRA implications. This is a positive policy as it provides for the retention and enhancement of recreational facilities, (including open space), that's existence can resulting recreational activities being diverted away from internationally designated sites.
Policy CFLR2 Local Green Space	Provides protection from development within Local Green Spaces, other than in very special circumstances	No HRA implications. This policy provides for the retention of local green spaces except for in very special circumstances. This is a positive policy as it provides for the retention Local Green Space that's existence can resulting recreational activities being diverted away from internationally designated sites.
Policy CFLR3 Public Rights of	Proposals for development must not adversely affect any Public Right of Way and, where possible, should incorporate measures to maintain and enhance	No HRA implications.

Way	the Rights of Way network.	This is a development management policy relating to the retention, maintenance and enhancement if PRWs.
Policy CFLR4 Water Based Recreation	Proposals for water-based recreation will be supported in principle, where: the proposal does not have a significant adverse impact on the nature conservation interest, the proposal does not conflict with the relevant River Catchment Management Plan; and the proposal does not have an adverse impact on any flood alleviation works and does not impede the Environment Agency's access requirements to waterworks.	Potential HRA implications. This is a development management policy relating to water based recreation. Potential impact pathways relating to the Lee Valley SPA/ Ramsar site are: • Recreational pressure. It is noted that this policy does not encourage water-based recreation, but supports it in 'principle'. No location, type or scale of development is identified. This policy does provide for some level of protection to internationally designated sites ensuring that 'proposal does not have a significant adverse impact on the nature conservation interest'. Individual proposals will need to be assessed as per Policy NE1 to ensure no adverse effects on the SPA would result.
Policy CFLR5 The Lee Valley Regional Park	The District Council supports the Lee Valley Regional Park Development Framework, which will be treated as a material consideration in the determination of planning applications in this area. Proposals for leisure related developments within the Lee Valley Regional Park will be supported in principle provided that intensive land-use leisure activities and associated buildings are located as unobtrusively as possible near existing settlements and do not conflict with other policies within this Plan.	Potential HRA implications This is a development management policy relating to the Lee Valley Regional Park. The area of the Regional park includes that of the Lee Valley SPA and Ramsar site; as such any development within the Regional Park (or in close proximity) does have potential to result in likely significant effects upon the designated site. However, this policy does state that leisure development within the Park will be supported in principle provided it does not conflict with other policies within the Plan. Policy NE1 (International, National and Locally Designated Nature Conservation Sites) of this plan provides protection to the SPA and Ramsar site, ensuring that no likely significant effects will result from this policy relating to the Lee Valley Regional Park.
Policy CFLR6 Equine Development	Provides for small scale equine development (up to 10 stables) in accordance with criteria such as minimising visual intrusion, must demonstrate that existing structures cannot be reused, must be in-keeping with character of the area, do not harm the natural environment, and do not conflict with other policies within the Plan.	No HRA implications. This is a development management policy relating to small-scale equine development.
Policy CFLR7 Community Facilities	Provides for adequate and appropriately located community facilities in association with new development. This allows for either on-site facilities or financial contributions for off-site provision	No HRA implications. This is a development management policy relating to community facilities.
Policy CFLR8	Provides for the retention of community facilities except in certain	No HRA implications.

Loss of Community Facilities	circumstances.	This is a development management policy relating to retention of community facilities.
Policy CFLR9 Health and Wellbeing	All development shall be designed to maximise the impact it can make to promoting healthy communities and reducing health inequalities. This includes provision of infrastructure and encouraging physical exercise and health including promoted walking and cycling routes. Where new health facilities are planned, these should be located where there is a choice of sustainable travel options	No HRA implications. This is a development management policy relating to walking and cycling routes.
Policy CFLR 10 Education	Development that creates a potential increase in demand for education will be required to make appropriate provision for new facilities either on-site or by making a suitable contribution towards the improvement or expansion of nearby existing facilities. Facilities should be in an accessible location, served by a choice of sustainable travel options. Provide or retain a suitable provision of outdoor recreation space and playing fields, in accordance with Policy CFLR1.	No HRA implications. This is a development management policy relating to the provision of education.
Policy NE1 International, National and Locally Designated Nature Conservation Sites	Provides for protection of international, national, and local designated conservation sites. Where a site of International or National designation for nature conservation importance is adversely affected by the proposals, permission will be refused unless the District Council is satisfied that: there are imperative reasons of overriding public interest, which could be of a social or economic nature, sufficient to override the harm to the site; there are imperative reasons of overriding public interest relating to human health, public safety or benefits of primary importance to the environment Proposals should avoid impacts on sites of nature conservation value and wherever possible, alternative options which reduce or eliminate such impacts should be pursued. Where adverse impacts are unavoidable, measures to mitigate the impact should be considered. Where adequate mitigation measures are not possible, compensatory measures may be appropriate.	No HRA implications. This is a key policy within the Plan that provides protection for internationally designated.
NE2 Sites of Nature Conservation Interest (Non-Designated)	Provides for a net gain in biodiversity using the BIAC, and avoid harm to, or the loss of features that contribute to the local and wider ecological network. Mitigation hierarchy will be applied as required.	No HRA implications. This provides policy relating to sites of nature conservation (non-designated).
Policy NE3 Species and Habitats	Seek to enhance biodiversity and to create opportunities for wildlife. Identifies the requirement for up to date evidence to support proposals. Identifies the need to demonstrate how physical features will be maintained in the long term. Provides against the loss or significant damage to trees, hedgerows and ancient woodland. Proposals will be expected to protect and enhance locally important biodiversity sites and other notable ecological features of conservation value.	No HRA implications. This is a positive development management policy as it provides protection for species and habitats.

	Provides protection for species and habitats of Principal Importance. Development adjoining rivers or streams must provide a minimum of a 10m buffer of complimentary habitat between the built environment and the watercourse.	
Policy NE4 Green Infrastructure	Provides for the protection and enhancement of the network of accessible, multi-functional green infrastructure for its biodiversity, recreational, accessibility, health and landscape value. Proposals should avoid loss, fragmentation of green infrastructure network. Maximise opportunities for improvement of green infrastructure in accordance with the Council's Green Infrastructure Plan, its Parks and Open Spaces Strategy, the Hertfordshire Biodiversity Action Plan, Living Landscape Schemes, locally identified Nature Improvement Areas and any future relevant plans and programmes as appropriate. Maximise opportunities for urban greening. Consider the integration of green infrastructure into proposals. Contributions towards local green infrastructure projects will be sought where appropriate.	No HRA implications. This is a positive development management policy relating to green infrastructure. Green infrastructure can divert recreational pressure away from internationally designated sites.
Policy HA1 Designated Heritage Assets	This is a development management policy relating to designated heritage assets. It provides for their preservation and enhancement.	No HRA implications. This is a development management policy relating to designated heritage assets.
Policy HA2 Non-Designated Heritage Assets	This is a development management policy relating to non- designated heritage assets.	No HRA implications. This is a development management policy relating to non- designated heritage assets.
Policy HA3 Archaeology	This is a development management policy relating to archaeological assets.	No HRA implications. This is a development management policy relating to archaeological assets.
Policy HA4 Conservation Areas	This is a development management policy relating to Conservation Areas.	No HRA implications. This is a development management policy relating to Conservation Areas.
Policy HA5 Shopfronts in Conservation Areas	This is a development management policy relating to shop fronts in Conservation Areas.	No HRA implications. This is a development management policy relating to shop fronts in Conservation Areas.
Policy HA6 Advertisements in Conservation Areas	This is a development management policy relating to advertisement in Conservation Areas.	No HRA implications. This is a development management policy relating to advertisement in Conservation Areas.
Policy HA7 Listed Buildings	This is a development management policy relating to listed buildings.	No HRA implications.

		This is a development management policy relating to listed buildings.
Policy HA8 Historic Parks and Gardens	This is a development management policy relating to historic parks and gardens.	No HRA implications. This is a development management policy relating to historic parks and gardens. The use of parks and gardens by the public has potential to divert recreational pressure away from internationally designated sites.
Policy HA9 Enabling Development	'Enabling development which would secure the future of a significant place, but would be contrary to other planning policy objectives, should be unacceptable unless:… The proposal does not materially detract from the archaeological, architectural, historic, artistic, landscape or nature conservation of the site or its setting'	No HRA implications. This is a development management policy to enable development. No type, location, or quantum of development is identified. Whilst this policy does allow for deviation from policies within the Plan, it ensures that any proposal must not materially detract from the nature conservation of the site or setting.
Policy CC1 Climate Change Adaptation	All new development should; demonstrate how its design, materials, construction and operation minimise over heating in summer and reduce the need for heating in winter. Integrate green infrastructure from the beginning of the design process to contribute to urban greening, including the public realm.	No HRA implications. This is a positive development management policy relating to climate change. It provides for reduced energy use from heating/ cooling and the provision of green infrastructure which can act to divert recreational pressure away from internationally designated sites.
Policy CC2 Climate Change Mitigation	All new developments should demonstrate how carbon dioxide emissions will be minimised across the development site. Carbon reduction should be met on site. Re-use and recycling of existing materials and the use of sustainable and local sourcing should be undertaken.	No HRA implications. This is a development management policy relating to climate change mitigation. It is positive as it encourages a reduction in carbon dioxide emissions and a reduction in use of carbon products, and the re-use, recycling, and use of sustainable and locally resourced materials. All these interventions have potential to reduce emissions contributing to atmospheric pollution, reduce water use, and improve water quality.
Policy CC3 Renewable and Low Carbon Energy	A development management policy relating to renewable and low carbon energy. It details that development will be permitted subject to environmental assets, and, local transport networks air quality and human health.	No HRA implications. This is a development management policy relating to renewable and low carbon energy. This policy acknowledges that development will be permitted subject to an assessment of environmental assets. The policy does not identify any type, location or quantum of development.
Policy WAT1 Flood Risk Management	The functional floodplain will be protected from inappropriate development. Development proposals should neither increase the likelihood or intensity of any form of flooding, nor increase the risk to people, property, crops or livestock from such events, both on site and to neighbouring land or further downstream. Development should take into account the impacts of climate change and should build in long term resilience against increased water levels.	No HRA implications. This is a development management policy relating to flood risk management. It does not identify and location, quantum or type of flood risk management. Point 2 of this policy ensures that proposals do not increase the likelihood or intensity of flood nor 'increase the risk to people, property, crops, or livestock'.
Policy WAT2	This is a development management policy relating to Source Protection Zones	No HRA implications.

Source Protection Zones	(SPZ) and provides the requirement for the need for the submission of an assessment of potential impacts and any mitigation measures required for: incinerators, waste transfer stations, vehicle dismantlers, metal recycling, waste treatment facilities and all other non landfill waste management activities, cemeteries, discharge of foul sewage to ground, cess pools, waste sites and underground storage of hazardous substances (i.e. petrol stations), new trade effluent discharges or stores, and storage of manure, slurry, sewage sludge and other farm waste.	This is a development management relating to SPZ's and the requirement for impact assessment for the identified scheme types within the SPZ.
Policy WAT3 Water Quality and the Water Environment	Development proposals will be required to preserve and enhance the water environment, ensuring improvements in surface water quality and the ecological value of watercourses and their margins and the protection of groundwater. Developers are required to retain an 8m buffer strip alongside all main rivers, and an appropriate buffer strip should be maintained at ordinary watercourses, along with an appropriate management plan. Opportunities for removal of culverts, river restoration and naturalisation are supported and additional culverting and development of river corridors will be resisted.	No HRA implications. This is a positive development management policy which has potential to improve water quality and reduce flooding.
Policy WAT4 Efficient Use of Water Resources	Aims to minimise the use of mains water by: incorporating water saving measures and equipment; incorporating the recycling of grey water and utilising natural filtration measures where possible; and designing residential development so that mains water consumption will meet a target of 110 litres or less per head per day.	No HRA implications. This is a positive development management policy relating to reducing water use. This has potential to reduce the amount of abstraction required.
Policy WAT5 Sustainable Drainage	Sustainable forms of drainage systems must be used in accordance with the SUDS hierarchy and provide long term management plans. Development should aim to achieve Greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. Drainage should be implemented in accordance with other policies within the Plan such as ensuring water efficiency and quality, biodiversity, amenity and recreation.	No HRA implications. This is a positive development management policy relating to sustainable drainage. It has potential to improve water quality.
Policy WAT6 Wastewater Infrastructure	Development proposals must ensure that adequate wastewater infrastructure capacity is available in tandem with development. This policy also provides for guidance for upgrading and expanding existing waste water treatment infrastructure. This includes text to ensure that it will have no adverse effect on the integrity of Special Protection Areas, Ramsar Sites and Special Areas of Conservation either alone or in combination with other projects and plans.	No HRA implications. Whilst the emission of water into watercourse from waste water treatment works has potential to impact upon internationally designated sites through a reduction in water quality, this policy provides explicit protection for internationally designated sites.
Policy EQ1 Contaminated Land and Land Instability	This is a development management policy relating to contaminated land.	No HRA implications. This is a development management policy relating to contaminated land.
Policy EQ2 Noise Pollution	This is a development management policy relating to noise pollution.	No HRA implications. This is a development management policy relating to noise pollution.

		This is a positive policy that could potentially help reduce the impact of disturbance to sensitive receptors from development in close proximity to an internationally designated site.
Policy EQ3 Light Pollution	This is a development management policy relating to light pollution	No HRA implications. This is a development management policy relating to light pollution. This is a positive policy that could potentially help reduce the impact of disturbance to sensitive receptors from development in close proximity to an internationally designated site.
Policy EQ4 Air Quality	Development and land uses should minimise potential impacts on local air quality both during construction and operation including the operation of heating, cooling and extraction units. It requires that applications should be supported by Air Pollution Assessment in line with the Council's Air Quality Planning Guidance Document. It provides for electrical vehicle charging points within new development. In order to minimise the impact of travel on local air quality, where major developments involve the introduction of new bus routes or significant changes to existing routes, service providers will be required, in agreement with Hertfordshire County Council's Transport, Access and Safety Unit, to ensure that the vehicles serving these locations will either be of 'hybrid' type or meet the latest 'Euro' emissions regulations	No HRA implications. This is a development management policy relating to air quality. This has potential to improve air quality.
Policy DEL1 Infrastructure and Service Delivery	The District Council will work in partnership with providers of infrastructure and services to facilitate the timely provision of infrastructure necessary to support sustainable development.	No HRA implications. This is a development management policy relating to the delivery of infrastructure and services. This policy provides for infrastructure improvements including to Sewage Treatment Works.
Policy DEL2 Planning Obligations	A development management policy relating to planning obligations	No HRA implications. This is a development management policy relating to planning obligations.

4.1.2 Table 5 below considers whether individual site allocations within the District Plan would have a likely significant effect. It does not consider likely significant effects in combination with all development across East Herts or further afield; that is incorporated into the following chapters.

Table 5: Screening assessment of Site Allocations

Policy	Site	Potential for likely significant effects alone?
Policy BISH1 Policy BISH7	Bishop's Stortford Goods Yard	None Sites are all located over 12km from Lee Valley SPA/Ramsar site, over 16km from Wormley-Hoddesdonpark Woods SAC and 17km from Epping Forest SAC
Policy BISH1 Policy BISH3	North of Bishop's Stortford	
Policy BISH1 Policy BISH4	Hadham Road Reserve Secondary School Site, Bishop's Stortford	
Policy BISH1 Policy BISH5	South of Bishop's Stortford	
Policy BISH1 Policy BISH6	Bishop's Stortford High School Site, London Road	
Policy BISH1 Policy BISH8	Land at Old River Lane, Bishop's Stortford	
Policy BISH1 Policy BISH9	Bishop's Stortford – East of Manor Links	
Policy BISH1 Policy BISH10	The Mill Site	
Policy HERT1 Policy HERT2	Hertford - Mead Lane Area	None Site is 4km from Lee Valley SPA/Ramsar site, 4.5km from Wormley-Hoddesdonpark Woods SAC and 13km from Epping Forest SAC
Policy HERT1 Policy HERT3	West of Hertford	None Site is 6km from Lee Valley SPA/Ramsar site, 3km from Wormley-Hoddesdonpark Woods SAC and 12km from Epping Forest SAC
Policy HERT1 Policy HERT4	North of Hertford	None Site is over 5km from Lee Valley SPA/Ramsar site, 6km from Wormley-Hoddesdonpark Woods SAC and 14km from Epping Forest SAC
Policy HERT1 Policy HERT5	South of Hertford	None Site is 4km from Lee Valley SPA/Ramsar site, 5km from Wormley-Hoddesdonpark Woods SAC and 13km from Epping Forest SAC
Policy SAWB1 Policy SAWB2	Sawbridgeworth – North of West Road	None Site is located over 9km from Lee Valley SPA/Ramsar site, over

Policy	Site	Potential for likely significant effects alone?
		13km from Wormley-Hoddesdonpark Woods SAC and 14km from Epping Forest SAC
Policy SAWB1 Policy SAWB3	Sawbridgeworth – South of West Road	None Site is located over 9km from Lee Valley SPA/Ramsar site, over 13km from Wormley-Hoddesdonpark Woods SAC and 14km from Epping Forest SAC
Policy SAWB1 Policy SAWB4	North of Sawbridgeworth	None Site is located over 10km from Lee Valley SPA/Ramsar site, over 14km from Wormley-Hoddesdonpark Woods SAC and 15km from Epping Forest SAC
Policy WARE1 Policy WARE2	North and East of Ware	None Site is located 740m from Amwell Quarry (Lee Valley SPA/Ramsar site) and 5.4km from Wormley-Hoddesdonpark Woods SAC
Policy EOS1	East of Stevenage	None Site is 15km from Lee Valley SPA/Ramsar site, 17km from Wormley-Hoddesdonpark Woods SAC and 27km from Epping Forest SAC
Policy GA1	Gilston Area	None Site is located 2.4km from Rye Meads (Lee Valley SPA/Ramsar site), 6.3km from Wormley-Hoddesdonpark Woods SAC and 11km from Epping Forest SAC
Policy EWEL1	East of Welwyn Garden City	None Site is 10km from Lee Valley SPA/Ramsar site, 6km from Wormley-Hoddesdonpark Woods SAC and 17km from Epping Forest SAC
Policy BUNT2	First School Site Allocation (educational site allocation)	None Sites are 15km from Lee Valley SPA/Ramsar site, 20km from Wormley-Hoddesdonpark Woods SAC and 29km from Epping Forest SAC
Policy BUNT3	Buntingford Business Park (employment allocation)	
Policy HOU9 Gypsies and Travellers and Travelling Showpeople	In addition to development management detail, this policy provides the following areas to provide accommodation for Gypsies and Travellers and Travelling Showpeople: **Gypsies and Travellers**	None, due to distance from European sites.

Policy	Site		Potential for likely significant effects alone?
	The Stables, Bayford	3 pitches	
	Birchall Garden Suburb, East of Welwyn Garden City	15 pitches	
	The Gilston Area	15 pitches	
	Travelling Showpeople		
	Gresley Park, East of Stevenage	5 plots	
	North and East of Ware	4 plots	
	The Gilston Area	8 plots	

4.1.3 It has been possible to dismiss urbanisation as an impact on the basis that the closest distance between a proposed District Plan housing or employment allocation and a European site is 730m.[39] All other proposed new housing, employment or school sites are at least 2.4km from the nearest European site. However, none of the other potential impact pathways can be dismissed without further analysis, due to the potential for in combination effects. Having completed the initial sift of policies and allocations, impact pathways are now discussed in more detail in the following chapters.

[39] Although Riverside Works, Amwell End at Stanstead Abbotts is located within 200m of Amwell Quarry (Lee Valley SPA/Ramsar site) this is an existing employment site rather than a new allocation

5 Recreational Pressure

5.1.1 The following policies and site allocations could not be dismissed in the initial sift from potentially posing likely significant effects upon the Lee Valley SPA/ Ramsar site, and Wormley-Hoddesdonpark Wood SAC, and Epping Forest SAC internationally designated sites as a result of increased recreational pressure. These are therefore discussed further in this chapter:

Policies

- Policy DPS1 Housing, Employment and Retail Growth
- Policy DPS2 The Development Strategy 2011-2033
- Policy DPS3 Housing Supply 2011-2033
- Policy BISH11: Employment in Bishop's Stortford
- Policy BISH12: Retail, Leisure and Recreation in Bishop's Stortford
- Policy BUNT1 Development in Buntingford
- Policy BUNT3 Employment in Buntingford
- Policy ED1 Employment

Site Allocations

5.1.2 Distances from internationally designated sites and the quantum of development to be delivered are identified in Table 5.

- All housing sites

5.1.3 Some policies within the Plan do provide a positive contribution that could result in a reduction in recreational pressure are as follows:

- Policy CFLR1 Open Space, Sport and Recreation: it provides for the retention and enhancement of recreational facilities, (including open space), that's existence can result in recreational activities being diverted away from internationally designated sites.
- Policy CFLR2 Local Green Space: it provides for the retention Local Green Space that's existence can result in recreational activities being diverted away from internationally designated sites.
- Policy NE4 Green Infrastructure: The provision of green infrastructure can divert recreational pressure away from internationally designated sites.
- Policy HOU12 Change of Use of Land to Residential Garden and Enclosure of Amenity Land: the retention of public access to public land, which could potentially divert recreational pressure away from an internationally designated site.

5.2 Lee Valley SPA and Ramsar site

5.2.1 The two parts of the SPA/Ramsar site within East Herts are Amwell Quarry (Amwell Nature Reserve) and Rye Meads Nature Reserve. These are managed by Hertfordshire and Middlesex Wildlife Trust and the RSPB. Both reserves are laid out in considerable detail with a network of hides (ten at Rye Meads, three at Amwell) and clearly marked footpaths/boardwalks with screening

vegetation that are specifically laid out and designed to route people away from the sensitive areas and minimise disturbance while at the same time accommodating high numbers of visitors. Moreover, no dogs are allowed (except registered assistance dogs) and the wet and marshy/open water nature of the habitats on site inherently limits off-track recreational activity, rendering it difficult to accomplish and unappealing. For these reasons it is considered that the vulnerability of Amwell Nature Reserve and Rye Meads Nature Reserve to the potential adverse effects of recreational activity that can affect other less well-managed sites is very low. Within Turnford and Cheshunt Pits, which lie outside East Herts but within the Lee Valley Country Park, recreational activity is similarly regulated through zoning of water bodies. The majority of the site is already managed in accordance with agreed management plans in which nature conservation is a high or sole priority.

5.2.2 It is also noted that the HRA of the Lee Valley Park Development Framework (UE Associates, 2009) was able to conclude that there would be no likely significant effect of the numerous measures and policies intended to increase public accessibility to the Regional Park (including those areas of international importance) due to the Regional Park Authority's overriding commitment to managing the Regional Park, their past experience of delivering increased access while avoiding disturbance and their ongoing commitment to visitor access management in the more sensitive parts of the Park. If proposals to improve accessibility in the Park can be concluded as being unlikely to lead to a significant effect, then logically, changes in the number of residents within the visitor catchment of the Park can be scoped out.

5.2.3 Recreational activity is therefore not considered further as an impact pathway with regard to this site. Currently, the SPA/Ramsar remains in favourable condition. **However, to maximise confidence that the SPA/Ramsar site is adequately protected, it is recommended that all new development deliver greenspace in-line with the Natural England ANG standard to ensure that it is self-sufficient.**

5.3 Wormley-Hoddesdonpark Woods SAC

5.3.1 The site is a large, attractive area of ancient woodland with extensive public access and close to large urban centres. The majority of the woods in the complex are in sympathetic ownership, with no direct threat (Hoddesdonpark Wood for example, is managed by The Woodland Trust). No visitor survey data that identifies the recreational catchment could be sourced for Wormley-Hoddesdonpark Woods. However, data does exist for other large woodland European sites, such as Ashdown Forest[40] and Epping Forest. These indicate that core visitor catchments (i.e. the zone within which the majority of regular visitors are concentrated) tend to lie between 2km-3km (Epping Forest) and 7km (Ashdown Forest) from the site. If the more precautionary figure of 7km is used, this zone would include Hertford and Ware within the recreational catchment of Wormley-Hoddesdonpark Woods SAC.

5.3.2 Natural England's Site Improvement Plan (SIP)[41] indicates that the site is heavily used by the public for recreational purposes. However, it also indicates that recreational activity is generally well-managed. Sensitive management of access points and routes by the site's main owners has been largely successful in mitigating the potential adverse effects of this high level of use. As such, general recreational pressure is not indicated in the Site Improvement Plan as a current or future obstacle to achieving or maintaining favourable conservation status and preserving the integrity of the SAC.

5.3.3 Recreation is actively promoted on this site and most recreation is concentrated on well-established paths. Most of the complex is covered by a High Forest Zone Plan (Hertfordshire County Council 1996) which sets out a framework for woodland management across the whole area. It aims to restore a varied age structure and natural stand types through sustainable forestry.

5.3.4 An increase in the population of Ware and Hertford associated with the delivery of currently unpermitted new housing may increase recreational activity within the SAC. However, the District Plan does not propose to allocate any new housing sites at all within 3km of the SAC and the nearest large housing site is 5km distant, to the east of Ware. Moreover, based on the issues

[40] Clarke RT, Sharp J & Liley D. 2010. Ashdown Forest Visitor Survey Data Analysis (Natural England Commissioned Reports, Number 048)
UE Associates and University of Brighton. 2009. Visitor Access Patterns on the Ashdown Forest: Recreational Use and Nature Conservation

[41] http://publications.naturalengland.org.uk/file/6541134543192064 [accessed 12/08/16]

identified in the Site Improvement Plan and the fact that concerns about recreational pressure on this site have not been flagged by Natural England during the preparation of the District Plan and its HRA, which commenced in 2012, there is no basis to conclude that such an increase would result in a likely significant effect on the SAC. However, the Site Improvement Plan does identify some visitor-related objectives and initiatives, to which it would be appropriate that East Herts District Council contributes.

In combination

5.3.5 The District Plan includes both new allocations (i.e. sites that do not currently have planning permission) and sites that have already received planning permission but which have not yet been delivered. The total amount of housing planned for East Herts over the District Plan period (considering new allocations and already permitted development) is 16,390 (2011-2033). However, this does not alter the conclusion of the HRA, since that conclusion is not based on the scale of growth in East Herts but on the fact that recreation does not appear to be a current or future concern as identified in the Site Improvement Plan, and that a mechanism that effectively manages recreational activity already exists for this site.

5.3.6 The HRA of the Broxbourne Local Plan is not yet publically available. However, the Sustainability Appraisal does discuss impacts on Wormley-Hoddesdonpark Woods SAC from development in Broxbourne and concludes that effects will not be significant, Some parts of Epping Forest District are likely to lie within the recreational catchment of the SAC, but these are all rural and are likely to receive relatively little new housing in the emerging Epping Forest Local Plan.

Recommendation

5.3.7 It is recommended that reference to a commitment by the Council to identified strategic initiatives (as identified in the SIP) is incorporated within the Plan. This includes:

- ***'Establish a 'light-weight' monitoring system for species or other site features likely to be sensitive to effects of public access (eg. vulnerable ground flora or veteran pollards close to main access points/routes);***
- ***Regularly review monitoring results and where feasible, modify access arrangements, signage etc to remedy adverse effects;'***
- ***'Identify areas still being damaged and the access points/routes used by illicit vehicle and for fly tipping; and,***
- ***'Where necessary, construct or repair barriers to prevent illicit access by vehicles, install more signage and CCTV cameras, and pursue prosecutions.'***

5.3.8 Further to this, it is also recommended that all new development deliver greenspace in-line with the Natural England ANG standard to ensure it is self-sufficient.

5.4 Epping Forest SAC

5.4.1 Epping Forest SAC receives a great many visits per year and discussions with the Corporation of London have identified long-standing concerns about increasing recreational use of the forest resulting in damage to its interest features. A programme of detailed formal visitor surveys has been undertaken in recent years. The most recent available visitor survey report[42] identifies that those living within 2km of the edge of the Forest comprise at least 95% of all visitors. However, although suitable for their original intended purpose, the Corporation of London have identified that these surveys may not be suitable to confirm a definitive core recreational catchment for the SAC and may underestimate the size of the core catchment. An analysis is currently being undertaken on behalf of the Corporation of London to confirm if any useful information can be extracted from these surveys, but otherwise it is possible that more detailed visitor survey work will be required. Any such survey, and any more refined assessment of impacts and mitigation solutions, would be undertaken within the scope of a strategic commitment that all the HMA authorities have made in a Memorandum of Understanding between the HMA authorities, Essex County Council, Hertfordshire County Council, Natural England and the Corporation of London.

[42] Alison Millward Associates. 2011. Epping Forest Visitor Survey 2011: Results Summary

5.4.2 That study is not available to inform this HRA of the East Herts District Plan. As such, a provisional assessment of likely recreational pressure is made. Since the recreational catchment of the SAC is likely to cross local authority boundaries, the analysis is inherently 'in combination'. Although the core recreational catchment of Epping Forest SAC cannot at this point be definitively confirmed, the settlement patterns around the SAC suggest that it would be reasonable to expect that most regular (i.e. weekly or daily) visitors to the SAC are likely to derive from the settlements of Loughton, Epping, Waltham Abbey, Theydon Bois, Chigwell and parts of the London Boroughs of Waltham Forest, Enfield and Redbridge, which all lie within 3km of the SAC. The nearest proposed housing site in East Herts is a large development at Gilston, north of Harlow and approximately 11km north of Epping Forest SAC. It is therefore reasonable to expect that development in East Herts district is unlikely to make a significant contribution to regular recreational visitors in the SAC.

5.4.3 However, that cannot be stated definitively at this point. Therefore, it is appropriate that East Herts shares in delivering the HMA-wide commitment set out in the Epping Forest SAC Memorandum of Understanding to undertake additional visitor survey of Epping Forest SAC if required to further refine the catchment. Once that survey work has been completed it may be possible to confirm that East Herts lies outside the core catchment, in which case no further participation in strategic mitigation solutions that may follow from any visitor survey (such as access management contributions) would be required. Since the commitment regarding recreational pressure is already provided in the Epping Forest SAC Memorandum of Understanding, which is a formal agreement, it does not need to be specifically referenced in the East Herts District Plan.

5.4.4 It is considered that the Epping Forest SAC Memorandum of Understanding, once signed by all parties, will provide an appropriate framework to ensure that Epping Forest SAC is protected from the adverse effects of new development and thus ensure no likely significant effect on the SAC would materialise in practice, either alone or in combination with other plans and projects.

5.4.5 **To maximise confidence that the SPA/Ramsar site is adequately protected, it is however also recommended that all new development deliver greenspace in-line with the Natural England ANG standard to ensure it is self-sufficient.**

6 Air quality

6.1.1 The following policies and site allocations could not be dismissed in the initial sift from potentially posing likely significant effects upon the Lee Valley SPA/ Ramsar site, and Wormley-Hoddesdonpark Wood SAC internationally designated sites as a result increased air pollution. Therefore further discussion is contained in this Chapter:

Policies

- Policy DPS1 Housing, Employment and Retail Growth
- Policy DPS2 The Development Strategy 2011-2033
- Policy DPS3 Housing Supply 2011-2033
- Policy BISH11: Employment in Bishop's Stortford
- Policy BISH12: Retail, Leisure and Recreation in Bishop's Stortford
- Policy BUNT1 Development in Buntingford
- Policy BUNT3 Employment in Buntingford
- Policy ED1 Employment

Site Allocations

6.1.2 Distances from internationally designated sites and the quantum of development to be delivered are identified in Table 5.

- All sites

6.1.3 There are also policies within the Plan do provide a positive contribution atmospheric improvements are as follows:

- Policy ED1 Employment: This policy does support employment which has potential to result in deterioration in air quality, however, this policy does provide for energy efficiency, ensuring sustainable transport can be used for access, and the use of fully integrated communications technology. These provisions have potential to result in improved air quality;
- Policy ED3 Communications Infrastructure: Increased/ improved communications infrastructure has potential to result in the need for less journeys to be taken, resulting in an improvement in air quality;
- Policy TRA1 Sustainable Transport: By definition sustainable development should not result in likely significant effect. This is a positive policy as it promotes and encourages the use of sustainable transport methods that have potential to result in a reduction in emissions of air pollutants; and,
- Policy CC2 Climate Change Mitigation: it encourages a reduction in carbon dioxide emissions and a reduction in use of carbon products, and the re-use, recycling, and use of sustainable and locally resourced materials. All these interventions have potential to reduce emissions contributing to atmospheric pollution.

6.2 Lee Valley SPA/Ramsar site

6.2.1 Parts of the Lee Valley SPA and Ramsar site are sensitive to deterioration in air quality, as the supporting habitat consists of terrestrial features that can be degraded by excessive deposition of pollutants. The Ramsar site is partly designated for its aquatic plant life, specifically the whorled water milfoil, which is dependent on calcareous water (and thus susceptible to acidification of the aquatic environment).

6.2.2 All forms of development within the Plan that would be likely to lead to increases in vehicle emissions within 200m of Lee Valley SPA and Ramsar could have potential to reduce air quality. The delivery of 16,390 new dwellings, including in specified areas in close proximity to the SPA/Ramsar, coupled with other employment and infrastructure development, is likely to lead to increased road traffic on routes within 200m of the designated site.

6.2.3 The only portion of the SPA/Ramsar site that that is located within 200m of a major road is Rye Meads SSSI located within 200m of the A414.

6.2.4 Traffic modelling and air quality impact assessment was undertaken to support the assessment of the different HMA Options. Option C resulted in the worst case change of traffic flows on the A414, with a total increase in AADT of 1750.

Table 6: HMA Transport Flow Data Summary

Link	Baseline (2014) AADT	2033 Do Minimum AADT	Option A AADT	Option B AADT	Option C AADT	Option D AADT	Option E AADT
A414 two way	20001	22798	23325	24520	24547	22299	21994

Table 7: Changes to traffic flows as a result of the five SMA Options

		Change in two–way AADT compared to DM. Positive numerals mean an increase, negative numerals mean a decrease				
Link	**2033 Do Minimum two way flows**	**Option A**	**Option B**	**Option C**	**Option D**	**Option E**
A414	22798	527	1723	1750	-499	-803

6.2.5 **Error! Reference source not found.** summarises the transport data for the HMA. **Error! Reference source not found.** identifies the changes in traffic flows on the A414 as a result of the HMA Options. The Design Manual for Roads and Bridges[43] states that if the change in flows between the Do Minimum and Do Something Scenarios is less than 1,000 AADT the air quality effect can be considered neutral and no further assessment is necessary. As can be seen in **Error! Reference source not found.**, the different SMA Options result in a variety of changes in AADT at each of the links, although in no case is there predicted to be an increase of more than 1,750 AADT for any HMA option. For the purpose of this assessment, the worst case change in traffic flows (Option E), even though this may not represent the final chosen option. This was subject to detailed air quality modelling, the results of which are provided in Appendix C.

6.2.6 At its closest, the SPA/Ramsar site is located 25m from the A414 behind a thick belt of trees, which will play some part in intercepting pollution from the road. The modelled annual mean NOx concentrations at this road link indicate that the change in NOx concentrations due to HMA traffic is not more than 1% of the Critical Load (i.e. 0.3µgm^{-3}). It is determined that at this level or below, the contribution of nitrogen deposition to a sensitive feature/ supporting habitat would not be significant and this is demonstrated by the nitrogen deposition calculations that have been undertaken. The most sensitive feature to changes in air quality is breeding bittern since it relies upon the fen, marsh and swamp habitats. The Critical Load for nitrogen deposition is 15kg/N/ha/yr (so 1% of this Critical Load is 0.15Kg/N/ha/yr). At its highest, Option E would contribute an increase in nitrogen deposition of 0.02Kg/N/ha/yr, which is much less than 1% of the Critical Load. As such it can be concluded that the level of development provided within the worst case Option (Option E) of the SMA would result in an imperceptible change in atmospheric pollution that would not lead to a likely significant effect

[43] Volume 11, Section 3, Part 1 (HA207/07)

upon Rye Meads SSSI (and thus the SPA/Ramsar site) either alone or in combination with other projects or plans.

6.3 Wormley-Hoddesdonpark Wood SAC

6.3.1 Wormley-Hoddesdonpark Woods SAC lies within 200m of the A10 at grid reference 535600,208750. However, this applies to a very small part of the site (approximately 500m^2) much of which is a track/path/arable field boundary and which constitutes approximately 0.01% of the SAC. Moreover it is situated on the edge of the 200m zone, being no closer to the A10 than 190m at any point.

6.3.2 As such, it is considered that increases in traffic movements on the A10 could not lead to a likely significant effect on the interest features of this SAC through changes in local air quality, due to the very small area of the SAC potentially affected and the very small extent to which it is likely to be affected given it is 190m from the road. Air quality on this site is not considered further. This conclusion was drawn in the initial HRA screening of emerging District Plan options in 2012 and was accepted by Natural England.

Figure 3: The area of Wormley-Hoddesdonpark Woods SAC within 200m of the A10.

6.4 Epping Forest SAC

6.4.1 As discussed in the methodology section, air quality in Epping Forest SAC was, like air quality along the A414 past the Lee Valley SPA/Ramsar site, subject to detailed analysis at the HMA level as part of the process of selecting an HMA-wide growth option. That analysis is provided in detail in Appendix D. However, it is summarised below.

6.4.2 There is relatively little difference between any of the Options. This is probably because all the Options have the same broad distribution for new housing i.e. clustered around Harlow, even though they vary in quantum and detailed distribution.

6.4.3 For all Options and all roads other than Theydon Road, there would be an increase in NOx concentration up to 10-20m from the roadside (depending on link modelled) that would be greater than 1% of the Critical Level. This varies from 0.4 µgm^{-3} (1.3% of the Critical Level) at the furthest distance, up to a maximum of 1.5 µgm^{-3} (5% of the Critical Level) immediately adjacent to the A104

under Option C. DMRB Interim Advice Note 174/12[44] classifies this as a 'small' change (which it defines in line with Institute of Air Quality Management practice as a change equivalent to 5% of the critical level or less). However, since it is over 1% of the Critical Level the contribution of the Options cannot be dismissed as imperceptible. It is therefore necessary to consider the implications of the elevated NOx. This is done by examining the resultant nitrogen and acid deposition, since these are the two primary pathways for NOx to affect vegetation (whether ground-based or epiphytic).

6.4.4 The calculations indicate that no modelled Option results in a change in nitrogen or acid deposition rate equivalent to (or even close to) 1% of the Critical Load on any road link. Therefore, it is possible to conclude in line with DMRB and AQTAG guidelines that all Options would make an imperceptible or inconsequential contribution to local nitrogen and acid deposition within Epping Forest SAC. Due to the ability to reach this conclusion it is not necessary to undertake an assessment of nitrogen deposition or acid deposition 'in combination' with other projects and plans because, as per DMRB and AQTAG, a contribution of less than 1% is so small that it is considered never to have a likely significant effect even in combination with other projects and plans. Not all NOx is deposited near the roadside; much is converted to other chemicals and/or dispersed more widely before being deposited. Therefore, the degree of change in nitrogen and acid deposition at a given distance from the roadside is always much smaller than the accompanying change in NOx concentrations.

6.4.5 The change in NOx concentrations at the roadside on several road links is predicted to be greater than 1% of the critical level (in the worst case, up to 5% of the critical level). Therefore, these cannot be described as imperceptible and require consideration 'in combination'. This is essentially achieved by examining the total Do Something NOx concentrations, as the Do Something scenario incorporates all expected future development including currently unimplemented planning permissions, plus background traffic growth. As per footnote 68, the Critical Level for NOx is set at 30 μgm^{-3} to capture the role of NOx in nitrogen deposition and particularly in growth effects. If nitrogen deposition due to a scheme can be dismissed as imperceptible even in combination, then whether the expected total NOx concentration is over 30 μgm^{-3} or not ceases to be particularly important and attention should be paid to other effects of NOx that may arise other than through its role as a source of nitrogen. These may include biochemical effects e.g. enzyme activity, chlorophyll content and physiological effects e.g. CO_2 assimilation or stomatal conductivity, although many of these changes may still be due to increased nitrogen rather than other effects of the gas such as acidity. Based on those studies, the physiological and biochemical effects of NOx do not appear to occur until much higher annual concentrations are reached. Even in epiphytic plants, no research has been sourced that indicates effects, other than via nitrogen, at lower concentrations. This is reflected in WHO (2000) which states that the '*general effect threshold … would be substantially higher if biomass production* [i.e. growth stimulation] *of crops is not assumed to be an adverse effect'*.[45] Reference to the data provided within the WHO report suggests that exposure to annual average concentrations below 100 μgm^{-3} are unlikely to cause direct biochemical or physiological effects based on the available studies and it may be that concentrations considerably above 100 μgm^{-3} would be required in the field before an effect was observed. From the tables above, the highest 'in combination' (Do Something) 2033 NOx concentration predicted on the modelled links from these Options is 56.5 μgm^{-3} immediately adjacent to the A121 between the Wake Arms Roundabout and the M25. This is certainly high enough for nitrogen deposition to be well above the minimum critical load but is well below the likely minimum NOx concentration at which other effects, unrelated to growth stimulation and nitrogen deposition, are likely to occur.

6.4.6 In summary therefore, based on the traffic flow data for the modelled links and using the criteria set by AQTAG, it can be concluded that there will be no adverse effect on the integrity of Epping Forest SAC from either option, either alone or in combination with other plans and projects.

6.4.7 <u>However</u>, even allowing for some improvement in background air quality to 2033 from improved emissions technology, the total nitrogen deposition rates adjacent to all modelled links will reach, or exceed, the lowest point of the currently used critical load range for Epping Forest SAC. As such, while the modelling indicates that none of the HMA Options can be 'blamed' for making a significant contribution to the future elevated nitrogen deposition rates, when all traffic is taken together there clearly will remain potential for a continued negative effect on the SAC by 2033. Therefore, while it may not be required as 'mitigation' it is considered appropriate that the HMA authorities pursue the

[44] The Design Manual for Roads and Bridges (Interim Advice Note 174/12 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07))

[45] WHO Regional Office for Europe, Copenhagen, Denmark, 2000. Air Quality Guidelines – Second Edition. Chapter 11

Memorandum of Understanding and use it as a basis to work cooperatively with The Corporation of London, Natural England and other partners to achieve material improvements in air quality and nitrogen inputs to Epping Forest SAC by 2033, such as through delivery of the Forest Transport Plan and Forest Nitrogen Action Plan. This would also be appropriate since it is recognised that transport modelling is predictive and it is impossible to know how accurate it will be until 2033, and it is recognised that some pollutants that have been identified of being of concern for the SAC (such as ammonia) cannot be accurately modelled and that there are currently difficulties modelling queuing traffic at Wake Arms Roundabout. Since the commitment to this work is set out in the Epping Forest SAC Memorandum of Understanding and this MoU is a formal document, the commitment does not need reproducing in the District Plan.

7 Water Abstraction

7.1.1 The following site allocations and policies could not be dismissed in the initial sift from potentially posing likely significant effects upon the Lee Valley SPA/ Ramsar site internationally designated sites as a result of changes to water levels due to abstraction for public water supply. They are therefore discussed further in this Chapter:

Policies

- Policy DPS1 Housing, Employment and Retail Growth
- Policy DPS2 The Development Strategy 2011-2033
- Policy DPS3 Housing Supply 2011-2033
- Policy BISH11: Employment in Bishop's Stortford
- Policy BISH12: Retail, Leisure and Recreation in Bishop's Stortford
- Policy BUNT1 Development in Buntingford
- Policy BUNT3 Employment in Buntingford
- Policy ED1 Employment

Site Allocations

- All sites

7.1.2 Policies within the Plan do provide a positive contribution towards reducing the need for water supply as follows:

- Policy ED1 Employment: This policy does support employment which has potential to result in deterioration in air quality, however, this policy does provide for energy efficiency, providing potential to result in reduce water use and the need for water supply;
- Policy CC2 Climate Change Mitigation: it encourages a reduction in carbon dioxide emissions and a reduction in use of carbon products, and the re-use, recycling, and use of sustainable and locally resourced materials. All these interventions have potential to reduce water use and the need for water supply;
- Policy WAT4 Efficient Use of Water Resources: measures provided within this policy have potential to reduce water use and the amount of water abstracted; and,
- Policy ED1 Employment: includes positive provisions including for energy efficiency, which has potential to result in lower water usage and the amount of water abstracted.

7.2 Lee Valley SPA/Ramsar site

7.2.1 The Lee Valley SPA/Ramsar site consists of four Sites of Special Scientific Interest, of which Turnford and Cheshunt Pits SSSI, Rye Meads SSSI and Amwell Quarry SSSI all lie on the Hertfordshire/Essex border. Walthamstow Reservoirs SSSI lies within London Borough of Waltham Forest. Walthamstow Reservoirs is a sealed storage reservoir and part of the public water supply

infrastructure for London. Rye Meads is unlikely to ever suffer from a shortage in water quantity due to its close relationship with Rye Meads Wastewater Treatment Works. The nearest proposed housing allocation to a relevant part of the SPA (Amwell Quarry) is 760m away, so direct water resource effects from specific development sites will not arise. However, the quarries could theoretically be adversely affected if groundwater abstraction for public water supply was sufficiently great to cause drawdown of water levels.

7.2.2 Public water supply for East Herts is handled by Affinity Water. It lies within the Central region, crossing the Lee and Stort Water Resource Zones. The Affinity Water Central region abstracts 60% of its water supply from groundwater sources with boreholes abstracting from chalk and gravel aquifers. The current Affinity Water Water Resource Management Plan covers the period up to 2040 and states that an HRA of the WRMP has been undertaken and that they have been able to demonstrate sufficient alternative supply options to ensure that adverse effects on European sites can be avoided. As such, it can be concluded that delivery of the East Herts District Plan will not result in adverse effects on Lee Valley SPA/Ramsar site through excessive water drawdown, either alone or in combination with other plans and projects.

8 Water Quality

8.1.1 The following site allocations and policies could not be dismissed in the initial sift from potentially posing likely significant effects upon the Lee Valley SPA/ Ramsar site internationally designated sites as a result of changes to water quality from treated wastewater discharge. They are therefore considered further in this Chapter:

Policies

- Policy DPS1 Housing, Employment and Retail Growth
- Policy DPS2 The Development Strategy 2011-2033
- Policy DPS3 Housing Supply 2011-2033
- Policy BISH11: Employment in Bishop's Stortford
- Policy BISH12: Retail, Leisure and Recreation in Bishop's Stortford
- Policy BUNT1 Development in Buntingford
- Policy BUNT3 Employment in Buntingford
- Policy ED1 Employment

Site Allocations

- All sites

8.1.2 Policies within the Plan do provide a positive contribution towards good water quality as follows:

- Policy CC2 Climate Change Mitigation: it encourages a reduction in carbon dioxide emissions and a reduction in use of carbon products, and the re-use, recycling, and use of sustainable and locally resourced materials. All these interventions have potential to improve water quality;
- Policy WAT3 Water Quality and the Water Environment: has potential to improve water quality and reduce flooding; and,
- Policy WAT5 Sustainable Drainage: has potential to improve water quality.

8.2 Lee Valley SPA/Ramsar site

8.2.1 Change in water quality is the main pathway through which the Lee Valley SPA/Ramsar site could be adversely affected. Two parts of the Lee Valley SPA/Ramsar site lie within East Herts: Amwell Quarry and Rye Meads. The nearest proposed development site to a part of Lee Valley SPA/Ramsar site is 760m distant, so direct surface water runoff effects on water quality will not arise. However, Rye Meads consists of non-operational land at and around the Rye Meads Wastewater Treatment Works (WwTW). Parts of the SPA consist of open water but other parts consist of fen or marsh vegetation that would theoretically be susceptible to nutrient enrichment from treated wastewater.

8.2.2 'Poor fens' (i.e. acidic fens) are strongly nitrogen limited. In other words, nitrogen availability is the factor which ultimately controls vegetation response to other nutrients and a small change in

nitrogen inputs can result in a major change in the vegetation composition. In contrast, other types of fen with a relatively alkaline pH (called 'rich' fens) such as those at Rye Meads are phosphorus-limited, meaning that phosphorus availability is the factor which ultimately controls vegetation response to other nutrients. This also applies to fluvial flood-plain grasslands like those at Rye Meads SSSI. In a phosphorus limited system, high nitrogen availability will not result in a deleterious effect on vegetation provided that phosphorus availability is controlled[46]. That is not to say that nitrogen inputs would therefore be irrelevant, but it does mean that when nitrogen is already in excess (and phosphorus inputs can be controlled) a proportionate response must be made to the risk posed by small additional nitrogen inputs. Effluent discharges from Rye Meads Sewage Treatment Works (STW) into Tollhouse Stream. The stream flows through the SSSI and has been known to back up into the marsh grassland parts of the SSSI during periods of high flow.

8.2.3 The current discharge consent for Rye Meads WwTW has been subjected to a review by the Environment Agency and Thames Water (Review of Consents) specifically for the purpose of determining whether the current consented phosphorus limits on the discharge are leading to an adverse effect on the Lee Valley SPA/Ramsar site, and if so, to amend the consent in order to avoid such an effect. As such, provided effluent from new development within the Rye Meads catchment can be accommodated within the existing volumetric discharge consent for the WwTW it can be concluded with confidence that an adverse effect on the SPA/Ramsar site is unlikely to occur from this pathway.

8.2.4 However, once the WwTW ceases to have capacity within its existing discharge consent for effluent from additional dwellings, it will be necessary for Thames Water to apply to the Environment Agency to increase the consented discharge volume, or direct flows to an alternative treatment facility. The Environment Agency is very unlikely to consent to an increase in discharge volume from the WwTW unless the phosphate concentration within the effluent can be further tightened to ensure no deterioration in water quality in Tollhouse Stream. There is a technical limit (known as the limit of Best Available Technology) to how much phosphorus removal a WwTW can incorporate. If this situation arises, there is a risk that future dwellings within the catchment could not be accommodated at Rye Meads WwTW, requiring an alternative treatment solution that does not as yet exist. Investigating these issues was one of the purposes of the Rye Meads Water Cycle Study (2009). Water quality is therefore an important pathway to investigate with regard to future development within the Rye Meads WwTW catchment.

8.2.5 With regard to East Herts, the key settlements of Hertford, Ware and Sawbridgeworth are all located within the catchment of Rye Meads WwTW, while development north of Harlow and east of Welwyn Garden City is also likely to be served by Rye Meads WwTW. The key settlements of Bishops Stortford and Buntingford are outside the catchment of Rye Meads WwTW. The bulk of wastewater volumes treated by the WwTW come from Stevenage, Welwyn Garden City and Harlow but settlements in East Herts also make a significant contribution.

8.2.6 Using less water per person will reduce the impact the new development on the hydraulic capacity at Rye Meads WwTW, allowing more development to be catered for within the existing capacity and delay the need for a larger volumetric discharge consent. However, East Herts District Council have confirmed that discussions with Thames Water has led the Company to confirm that following modelling in late 2015/early 2016 they are happy that Rye Meads STW can accommodate the growth proposed at the Gilston Area as well as growth in the wider Harlow area. The current predictions show that Rye Meads STW can relatively comfortably deal with known growth up to 2036. In the period from 2036 to 2041 the site becomes more stressed but not necessarily to an extent that would trigger an upgrade to the site.

8.2.7 Since 2036 to 2041 is beyond the District Plan period, it is therefore possible to conclude that the District Plan will not result in a water quality effect on Lee Valley SPA/Ramsar site either alone or in combination with other projects and plans.

[46] '*In a nutrient limited system, excess of the non-limiting nutrient may not result in any signs of enrichment in the vegetation as the plants are unable to make use of one nutrient without sufficient amounts of the other*'. Source: Understanding Fen Nutrients http://www.snh.gov.uk/docs/A416930.pdf

9 Conclusion

9.1.1 Provided that the recommendations made in this document are incorporated into the District Plan, it would be possible to conclude that the East Herts District Plan will not result in a likely significant effect, either alone or in combination, upon any European sites. This conclusion is contingent upon the signature, adoption and implementation of the Epping Forest SAC Memorandum of Understanding between the HMA authorities, Hertfordshire County Council, Essex County Council, Natural England and the Corporation of London. This will ensure that any issues that may arise regarding air quality or recreational pressure on Epping Forest SAC can be identified and addressed before they result in a likely significant effect.

9.1.2 The recommendations are as follows:

9.1.3 It is recommended that reference to a commitment by the Council to identified strategic initiatives to manage recreation at Wormley-Hoddesdonpark Woods (as identified in the SIP for that SAC) is incorporated within the Plan. This includes:

- ***'Establish a 'light-weight' monitoring system for species or other site features likely to be sensitive to effects of public access (eg. vulnerable ground flora or veteran pollards close to main access points/routes);***
- ***Regularly review monitoring results and where feasible, modify access arrangements, signage etc to remedy adverse effects;'***
- ***'Identify areas still being damaged and the access points/routes used by illicit vehicle and for fly tipping*; and,**
- ***'Where necessary, construct or repair barriers to prevent illicit access by vehicles, install more signage and CCTV cameras, and pursue prosecutions.'***

9.1.4 Further to this, it is also recommended that all new development deliver greenspace in-line with the Natural England ANG standard to ensure it is self-sufficient.

Appendix A. Figures

Appendix B. Background to Internationally Designated Sites

B.1 Epping Forest SAC

B.1.1 Introduction

Epping Forest SAC is located approximately 10km south of East Herts district. 70% of the 1,600 hectare site consists of broadleaved deciduous woodland, and it is one of only a few remaining large-scale examples of ancient wood-pasture in lowland Britain. Epping Forest supports a nationally outstanding assemblage of invertebrates, a major amphibian interest and an exceptional breeding bird community.

B.1.2 Reasons for Designation[47]

Epping Forest qualifies as a SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitats of:

- Beech forests on acid soils with *Ilex* and sometime *Taxus* in the shrublayer.
- Wet heathland with cross-leaved heath; and
- Dry heath

Secondly, the site contains the Habitats Directive Annex II species Stag beetle *Lucanus cervus*, with widespread and frequent records.

B.1.3 Current Pressures and Threats[48]

- Air pollution
- Under grazing
- Public disturbance
- Changes in species distribution
- Inappropriate water levels
- Water pollution
- Invasive species
- Disease

B.1.4 Conservation Objectives

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site

[47] JNCC (2015) Natura 200 Standard Data Form: Epping Forest SAC
[48] Natural England (2015). Site Improvement Plan: Epping Forest SAC

B.2 Lee Valley SPA and Ramsar Site

B.2.1 Introduction

The Lee Valley comprises a series of embanked water supply reservoirs, sewage treatment lagoons and former gravel pits along approximately 24 km of the valley. These waterbodies support internationally important numbers of wintering gadwall and shoveler, while the reedbeds support a small but internationally important population of bittern. In addition to the ornithological interest, the site also qualifies as a Ramsar site on account on rare and scarce plants and invertebrates present.

The Lee Valley SPA/Ramsar consists of four Sites of Special Scientific Interest, of which Turnford and Cheshunt Pits SSSI, Rye Meads SSSI and Amwell Quarry SSSI all lie on the Hertfordshire/Essex border. Walthamstow Reservoirs SSSI lies within London Borough of Waltham Forest. The Special Protection Area is managed by the Lee Valley Regional Park Authority and by Thames Water.

B.2.2 Reasons for Designation

The Lee Valley site is designated as an SPA[49]: for its Birds Directive Annex I and Ramsar site under criterion 6[50] for species that over-winter, and these are:

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

In addition, the site qualifies as a Ramsar under criterion 2[51], by supporting the nationally scarce plant species whorled water-milfoil *Myriophyllum verticillatum* and the rare or vulnerable invertebrate *Micronecta minutissima* (a water-boatman).

B.2.3 Current Pressures and Threats[52]

- Water pollution
- Hydrological changes
- Public disturbance
- Inappropriate scrub control
- Fishing
- Air pollution
- Inappropriate cutting and mowing
- Invasive species

B.2.4 Conservation Objectives[53]

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,

[49] http://jncc.defra.gov.uk/page-2047-theme=default [accessed 12/08/2016]
[50] http://jncc.defra.gov.uk/pdf/RIS/UK11034.pdf [accessed 12/08/2016]
[51] Ibid
[52] http://publications.naturalengland.org.uk/file/5788502547496960 [accessed 12/08/2016]
[53] http://publications.naturalengland.org.uk/file/5168095937167360 [accessed 12/08/2016]

- The distribution of the qualifying features within the site.

B.3 Wormley-Hoddesdonpark Woods SAC

B.3.1 Introduction

This SAC consists of two SSSIs – Wormley-Hoddesdonpark Woods North and Wormley-Hoddesdonpark Woods South and is situated on the southern border of East Herts, with part of the SAC in Broxbourne. The semi-natural woodland is of national importance as an example of lowland south-east sessile oak/hornbeam type with the pedunculate oak/hornbeam variant also present. Additionally, small ponds and streams are important habitats for bryophytes.

B.3.2 Reasons for Designation[54]

Wormley-Hoddesdonpark Woods qualifies as a SAC through its habitats, containing the Habitats Directive Annex I habitat:

- Oak-hornbeam forests – this is one of only two outstanding locations for such habitat in the UK.

B.3.3 Current Pressures and Threats[55]

- Disease
- Invasive species
- Air pollution
- Deer
- Illicit vehicle
- Woodland/ forestry management
- Recreation

B.3.4 Conservation Objectives[56]

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features'), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely

[54] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0013696 [accessed 12/08/2016]
[55] http://publications.naturalengland.org.uk/file/6541134543192064 [accessed 12/08/2016]
[56] http://publications.naturalengland.org.uk/file/6475250191564800 [accessed 12/08/2016]

Appendix C. Air Quality Impact Assessment: Lee Valley SPA/Ramsar site

Option A

A414												
	Annual Mean NOx Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
25	31.7	21.7	21.8	0.1	15.30	11.64	11.65	0.01	1.24	1.21	1.21	0.00
50	28.2	19.9	20.0	0.1	15.12	11.55	11.56	0.00	1.22	1.20	1.20	0.00
100	25.8	18.7	18.8	0.0	15.00	11.49	11.49	0.00	1.21	1.20	1.20	0.00
150	24.9	18.2	18.3	0.0	14.95	11.47	11.47	0.00	1.20	1.20	1.20	0.00
200	24.4	18.0	18.0	0.0	14.92	11.45	11.46	0.00	1.20	1.19	1.19	0.00

Option B

A414												
	Annual Mean NOx Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
25	31.7	21.7	22.0	0.3	15.30	11.64	11.66	0.02	1.24	1.21	1.22	0.00
50	28.2	19.9	20.1	0.2	15.12	11.55	11.56	0.01	1.22	1.20	1.21	0.00
100	25.8	18.7	18.8	0.1	15.00	11.49	11.50	0.01	1.21	1.20	1.20	0.00
150	24.9	18.2	18.3	0.1	14.95	11.47	11.47	0.01	1.20	1.20	1.20	0.00
200	24.4	18.0	18.1	0.1	14.92	11.45	11.46	0.00	1.20	1.19	1.19	0.00

Option C

A414												
	Annual Mean NOx Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
25	31.7	21.7	22.0	0.3	15.30	11.64	11.66	0.02	1.24	1.21	1.22	0.00
50	28.2	19.9	20.1	0.2	15.12	11.55	11.56	0.01	1.22	1.20	1.21	0.00
100	25.8	18.7	18.8	0.1	15.00	11.49	11.50	0.01	1.21	1.20	1.20	0.00
150	24.9	18.2	18.3	0.1	14.95	11.47	11.47	0.01	1.20	1.20	1.20	0.00
200	24.4	18.0	18.1	0.1	14.92	11.45	11.46	0.00	1.20	1.19	1.19	0.00

Option D

A414												
	Annual Mean NOx Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
25	31.7	21.7	21.6	-0.1	15.30	11.64	11.64	0.00	1.24	1.21	1.21	0.00
50	28.2	19.9	19.9	-0.1	15.12	11.55	11.55	0.00	1.22	1.20	1.20	0.00
100	25.8	18.7	18.7	0.0	15.00	11.49	11.49	0.00	1.21	1.20	1.20	0.00
150	24.9	18.2	18.2	0.0	14.95	11.47	11.47	0.00	1.20	1.20	1.20	0.00
200	24.4	18.0	18.0	0.0	14.92	11.45	11.45	0.00	1.20	1.19	1.19	0.00

Option E

A414												
	Annual Mean NOx Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
25	31.7	21.7	21.6	-0.1	15.30	11.64	11.64	-0.01	1.24	1.21	1.21	0.00
50	28.2	19.9	19.8	-0.1	15.12	11.55	11.55	0.00	1.22	1.20	1.20	0.00
100	25.8	18.7	18.7	-0.1	15.00	11.49	11.49	0.00	1.21	1.20	1.20	0.00
150	24.9	18.2	18.2	0.0	14.95	11.47	11.47	0.00	1.20	1.20	1.20	0.00
200	24.4	18.0	18.0	0.0	14.92	11.45	11.45	0.00	1.20	1.19	1.19	0.00

Appendix D.Air Quality Impact Assessment: Epping Forest SAC

Traffic flow data

The transport consultancy Jacobs used a spreadsheet model to generate flow data for the following roads within 200m of Epping Forest SAC:

- A121 (two sections);
- A104;
- B1393;
- B172; and
- Theydon Road

The flow data for each road are presented below as Annual Average Daily Traffic (AADT). Percentage heavy duty vehicles and average vehicle speeds are also provided. For the purposes of these analyses it was assumed that percentage HDV and average vehicle speeds would remain essentially similar to 2033; this is the standard assumption. Baseline is the AADT flow on each link as of 2014. Do Minimum is the change in flows due to delivery of existing planning permissions in the HMA and general background traffic growth as a result of population growth expected to 2033 without any of the HMA Options. The flows due to each HMA option are then shown in Columns 4 to 8. All Options A to E involve the same assumptions about employment traffic.

1	2			3	4	5	6	7	8
	Baseline (2014)			**2033 Do Minimum**	**Option A**	**Option B**	**Option C**	**Option D**	**Option E**
Link (NB = northbound lane etc.)	**AADT**	**% HDV**	**Speed (kph)**	**AADT**	**AADT**	**AADT**	**AADT**	**AADT**	**AADT**
B1393 NB	10593	2.9	62	12861	13719	13699	13713	13422	13827
B1393 SB	9477	1.3	45	12074	12853	12697	12858	12462	12646
B172 EB	3907	2.5	53	4472	4223	4222	4225	4190	4232
B172 WB	4241	4.9	40	4926	4992	4953	4957	4950	5035
A121 between Wake Arms Roundabout and Loughton NB	9980	1.2	19	11859	12075	12063	12051	11843	12181
A121 between Wake Arms Roundabout and Loughton SB	10430	2.1	56	12134	11607	11550	11589	11504	11593
A104 NB	8031	4.0	53	9680	9954	10000	10001	9669	10017
A104 SB	8165	2.7	48	10356	11684	11431	11599	11449	11660
A121 between Wake Arms Roundabout and the M25 EB	12228	2.8	34	13982	14029	13927	14001	14027	14074
A121 between Wake Arms Roundabout and the M25 WB	13008	3.5	40	15798	17075	16974	17023	16632	17130
Theydon Rd NB	4225	1.2	54	5174	5233	5251	5257	5092	5262
Theydon Rd SB	3677	1.5	53	4681	4976	4901	4973	4858	4903

The total change in two-way flows between Options A to E on the one hand and the Do Minimum Scenario on the other tells us the change specifically due to each Option (as distinct from the total change to 2033). These are the data that are used to determine the specific impact of each option in line with the Design Manual for Roads and Bridges. These data are summarised below. According to the Design Manual for Roads and Bridges guidance for assessing air quality impact of traffic, a two-way increase in flows of less than 1,000 AADT (assuming the percentage HDV and average vehicle speeds remain the same) means that '*the impact of the scheme can be considered to be neutral in terms of local air quality and no further work is needed'*. Nonetheless, in this exercise all changes in flows were subject to air quality calculation.

		Change in two–way AADT compared to DM. Positive numerals mean an increase, negative numerals mean a decrease				
Link	**2033 Do Minimum two way flows**	**Option A**	**Option B**	**Option C**	**Option D**	**Option E**
B1393	24,935	1,637	1,461	1,636	949	1,538
B172	9,398	- 183	- 223	- 216	- 258	- 131
A121 (between Wake Arms Roundabout and Loughton)	23,993	- 311	- 380	- 353	- 646	- 219
A104	20,036	1,602	1,395	1,564	1,082	1,641
A121 (between Wake Arms Roundabout and M25)	29,780	1,324	1,121	1,244	879	1,424
Theydon Rd	9,855	354	297	375	95	310

From examining the changes in flows due to each Option, it can be seen that the change in flows is fairly small in all cases. This is probably because:

1. Although the total amount of housing being planned under each option is large, a significant proportion of that housing already has planning permission (and is thus counted as part of the Do Minimum Scenario, since it would occur whether or not any of the Scenarios were chosen);

2. Of the housing that does not have planning permission, a large amount in each case is situated between 5km and 10km north of Epping Forest SAC around Harlow, such that there are plenty of opportunities for traffic generated by that housing to disperse across the network before it reaches Epping Forest; and

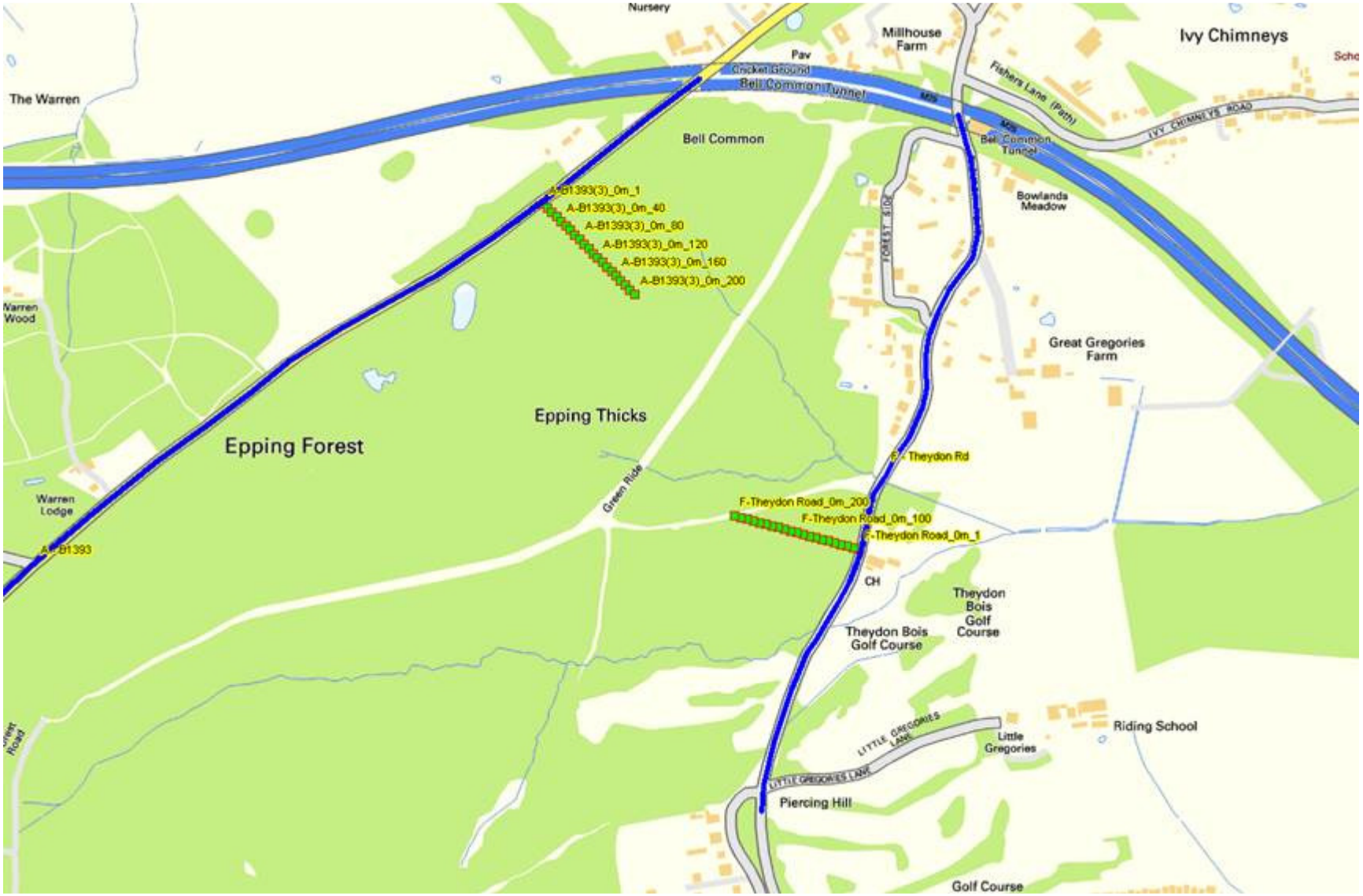
3. All of these scenarios involve some transport improvements and the model may have predicted that vehicle flows on some links will change due to those. Alternatively, the model may be assuming traffic is redeploying onto other roads for other reasons. For example, scrutiny of the data suggests that under each Option the traffic model expects slightly less traffic to head south from Wake Arms Roundabout to Loughton than would otherwise occur by 2033, but expects slightly more to move between Wake Arms Roundabout and the M25 in both directions.

It is important to remember that the numbers above are the changes in flows due to that option compared to the 2033 flows without that option. So, for example, Option D for Theydon Road is not saying that by 2033 flows will only have increased by 95 vehicles per day compared to 2014, but that a further 95 vehicles per day (average) is the difference which Option D would make compared to background traffic growth and delivery of existing planning permissions.

The two links (B172 and A121 from Wake Arms Roundabout to Loughton) that are predicted to experience an overall reduction in flows by 2033 due to every Option are not presented as air quality calculations below, since clearly the impact of the Options A to E will not be adverse compared to the situation without any Option.

Air quality calculations

For each of the roads air quality transects were calculated up to 200m back from the roadside as below. For some road sections (particularly around Wake Arms Roundabout) multiple transects were modelled to account for the influence of the predominant wind direction and emissions from the other nearby road links. In the summary tables below the worst case results are presented for each road link and option.


Nursery
Millhouse Farm
Ivy Chimneys
Pav
Cricket Ground
Bell Common Tunnel
The Warren
Bell Common
Fishers Lane (Path)
IVY CHIMNEYS ROAD
Bell Common Tunnel
Bowlands Meadow
A-B1393(3)_0m_1
A-B1393(3)_0m_40
A-B1393(3)_0m_80
A-B1393(3)_0m_120
A-B1393(3)_0m_160
A-B1393(3)_0m_200
Warren Wood
Great Gregories Farm
Epping Thicks
Epping Forest
F-Theydon Rd
Green Ride
F-Theydon Road_0m_200
F-Theydon Road_0m_100
F-Theydon Road_0m_1
Warren Lodge
A-B1393
CH
Theydon Bois Golf Course
Theydon Bois Golf Course
Riding School
LITTLE GREGORIES LANE
Little Gregories
Piercing Hill
Golf Course


Stable Shaw
Woodredon Farm
Long Running
Car Park
Wake Arms Roundabout
Oak Hill
Sunshine Plain
Copley Plain
Deershelter Plain
Wake Valley Pond
Hangboy Slade
Furze Ground
Birch Wood

When calculating Do Minimum NOx concentrations, air quality impact assessment guidance from Department for Transport (HA207/07, Annex F) advises that baseline concentrations should be reduced by 2% per annum in order to reflect expected improvements in background air quality in the future. However, we are aware that some regard this as overambitious. Therefore, in the tables below we have made the assumption that that conditions in 2023 (the midpoint between the base year and the year of assessment) are representative of conditions in 2033 (the year of assessment). This approach is accepted within the professional air quality community and accounts for known recent improvements in vehicle technologies (new standard Euro 6/VI vehicles), whilst excluding the more distant and tenuous projections regarding the evolution of the vehicle fleet.

Any process that involves the release of combustion products into atmosphere will contribute to atmospheric pollution, such that a plan or project that resulted in (for example) a single additional car journey on a given road through Epping Forest SAC will be contributing to pollution to some degree. With this principle in mind, the Air Quality Technical Advisory Group (AQTAG; consisting of Environment Agency, Natural England and Natural Resources Wales) has drawn a clear distinction between '*plans and projects considered to be inconsequential and never likely to have an in-combination effect (and so not included in any assessment of likely significant effect in-combination with a new plan or project) and those concluded to have 'no likely significant effect' (insignificant alone but which may need to be considered in the assessment of any other new plans or projects)*[57]*.* The threshold they use for deciding whether a plan or project (or in this case each HMA growth option) is inconsequential is '1% of the Critical Level' (for NOx)[58] or '1% of the Critical Load'[59] for nitrogen and acid deposition. Design Manual for Roads and Bridges advises that where the concentration within the emission footprint [i.e. the Process Contribution (PC), the contribution of the scheme in question] in any part of the European site(s) is 1% of the relevant long-term benchmark (Critical Level or Critical Load) or less, the emission is 'imperceptible' and not likely to have a significant effect alone or in combination with other projects and plans irrespective of the background levels[60].

In the tables that follow, each option is analysed for each road link. The air quality impact of each option is reflected in the 'Change' column, this being the difference between the 2033 Do Minimum Scenario and each HMA Option. Where this is less than 1% of the Critical Level or Load it is shown as a green cell. Where it is above 1% of the Critical Level or Load it is shown as an orange cell. Note that where the number given in a cell is 0.00 it does not literally mean that there will be no deposition but rather that it will be less than 0.01 kgN/ha/yr or keq/ha/yr and thus below the rate that can be modelled.

[57] AQTAG position regarding In-combination guidance and assessment. Correspondence between AQTAG and PINS. March 2015 states that: '*AQTAG is confident that a process contribution* [the difference between Do Minimum and Do Something Scenarios] *< 1% of the relevant critical level or load (CL) can be considered inconsequential and does not need to be included in an in-combination assessment'*

[58] The Critical Level for NOx is set for all vegetation at 30 μgm^{-3}. Experiments have shown that the different effects of NOx occur at different annual concentrations and some will not arise until concentrations of several hundred (or even thousand) micrograms per cubic metre are reached. However, the growth stimulation or inhibition nitrogen deposition effects arise at the lowest annual concentrations and 30 μgm^{-3} was chosen as the Critical Level on the basis that concentrations below this level are very unlikely to be accompanied by significant nitrogen deposition unless there are other sources of atmospheric nitrogen.

[59] The Air Pollution Information System (www.apis.ac.uk) gives 10 kgN/ha/yr as the lowest point in the Critical Load range for Epping Forest SAC.

[60] Design Manual for Roads and Bridges Interim Advice Note (IAN) 174/13 (2013) Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07) states that '*Where the difference in concentrations* [between the Do Minimum and Do Something Scenarios] *are less than 1% of the air quality threshold then the change at these receptors is considered to be imperceptible and they can be scoped out of the judgement on significance'*.

Option A

A121 between Wake Arms Roundabout and M25												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	92.1	55.0	56.5	1.5	17.77	13.13	13.20	0.06	1.36	1.24	1.24	0.01
10	60.0	36.9	37.7	0.8	16.47	12.34	12.38	0.04	1.23	1.16	1.16	0.00
20	48.6	30.4	30.9	0.5	15.95	12.03	12.06	0.03	1.17	1.12	1.13	0.00
50	37.8	24.4	24.7	0.3	15.43	11.74	11.75	0.01	1.12	1.09	1.09	0.00
100	32.8	21.7	21.8	0.2	15.19	11.60	11.61	0.01	1.10	1.08	1.08	0.00
150	30.9	20.6	20.7	0.1	15.09	11.55	11.56	0.01	1.09	1.07	1.07	0.00
200	29.9	20.1	20.2	0.1	15.04	11.52	11.53	0.00	1.08	1.07	1.07	0.00
B1393												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	59.6	38.5	39.8	1.4	16.60	12.51	12.57	0.06	1.24	1.17	1.18	0.01
10	43.0	28.2	28.9	0.7	15.84	12.02	12.06	0.04	1.16	1.12	1.13	0.00
20	36.7	24.3	24.8	0.5	15.54	11.83	11.86	0.03	1.13	1.10	1.11	0.00
50	30.7	20.6	20.8	0.3	15.24	11.64	11.66	0.01	1.10	1.08	1.09	0.00
100	28.0	18.9	19.1	0.1	15.10	11.56	11.57	0.01	1.09	1.08	1.08	0.00
150	27.0	18.3	18.4	0.1	15.05	11.53	11.53	0.01	1.08	1.07	1.07	0.00
200	26.5	18.0	18.1	0.1	15.02	11.51	11.52	0.00	1.08	1.07	1.07	0.00
A104												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	59.1	37.2	38.8	1.6	16.57	12.42	12.50	0.07	1.24	1.16	1.17	0.01
10	42.2	27.4	28.2	0.8	15.80	11.96	11.99	0.04	1.16	1.12	1.12	0.00
20	36.2	24.0	24.5	0.5	15.50	11.79	11.81	0.03	1.13	1.10	1.10	0.00

50	30.5	20.7	21.0	0.3	15.21	11.62	11.64	0.01	1.10	1.08	1.08	0.00
100	28.0	19.3	19.4	0.2	15.08	11.55	11.56	0.01	1.09	1.07	1.07	0.00
150	27.0	18.7	18.9	0.1	15.04	11.52	11.53	0.01	1.08	1.07	1.07	0.00
200	26.6	18.5	18.6	0.1	15.01	11.51	11.51	0.01	1.08	1.07	1.07	0.00
Theydon Road												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	41.3	26.5	26.8	0.3	15.48	11.81	11.83	0.01	1.22	1.19	1.19	0.00
10	34.9	22.4	22.6	0.1	15.16	11.61	11.62	0.01	1.18	1.17	1.17	0.00
20	32.8	21.1	21.2	0.1	15.06	11.55	11.55	0.01	1.17	1.16	1.16	0.00
50	31.0	20.0	20.0	0.1	14.96	11.49	11.49	0.00	1.16	1.16	1.16	0.00
100	30.2	19.5	19.6	0.0	14.92	11.46	11.46	0.00	1.16	1.16	1.16	0.00
150	30.0	19.4	19.4	0.0	14.91	11.45	11.46	0.00	1.16	1.15	1.15	0.00
200	29.9	19.3	19.3	0.0	14.91	11.45	11.45	0.00	1.16	1.15	1.15	0.00

Option B

Theydon Road												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	41.3	26.5	26.8	0.2	15.48	11.81	11.83	0.01	1.22	1.19	1.19	0.00
10	34.9	22.4	22.6	0.1	15.16	11.61	11.62	0.01	1.18	1.17	1.17	0.00
20	32.8	21.1	21.2	0.1	15.06	11.55	11.55	0.00	1.17	1.16	1.16	0.00
50	31.0	20.0	20.0	0.0	14.96	11.49	11.49	0.00	1.16	1.16	1.16	0.00
100	30.2	19.5	19.6	0.0	14.92	11.46	11.46	0.00	1.16	1.16	1.16	0.00
150	30.0	19.4	19.4	0.0	14.91	11.45	11.46	0.00	1.16	1.15	1.15	0.00
200	29.9	19.3	19.3	0.0	14.91	11.45	11.45	0.00	1.16	1.15	1.15	0.00

A121 between Wake Arms Roundabout and M25												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	92.1	55.0	56.2	1.3	17.77	13.13	13.19	0.05	1.36	1.24	1.24	0.01
10	60.0	36.9	37.5	0.7	16.47	12.34	12.37	0.03	1.23	1.16	1.16	0.00
20	48.6	30.4	30.9	0.4	15.95	12.03	12.06	0.02	1.17	1.12	1.13	0.00
50	37.8	24.4	24.6	0.2	15.43	11.74	11.75	0.01	1.12	1.09	1.09	0.00
100	32.8	21.7	21.8	0.1	15.19	11.60	11.61	0.01	1.10	1.08	1.08	0.00
150	30.9	20.6	20.7	0.1	15.09	11.55	11.55	0.00	1.09	1.07	1.07	0.00
200	29.9	20.1	20.1	0.1	15.04	11.52	11.52	0.00	1.08	1.07	1.07	0.00
B1393												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	65.8	41.3	42.6	1.3	16.60	12.52	12.57	0.06	1.33	1.26	1.27	0.01
10	47.5	30.1	30.8	0.6	15.78	11.99	12.02	0.03	1.25	1.21	1.21	0.00
20	41.1	26.2	26.6	0.4	15.47	11.80	11.82	0.02	1.21	1.19	1.19	0.00
50	35.0	22.4	22.6	0.2	15.17	11.61	11.62	0.01	1.18	1.17	1.17	0.00
100	32.3	20.7	20.8	0.1	15.03	11.52	11.53	0.01	1.17	1.16	1.16	0.00
150	31.2	20.1	20.2	0.1	14.98	11.49	11.50	0.00	1.16	1.16	1.16	0.00
200	30.7	19.8	19.8	0.1	14.95	11.48	11.48	0.00	1.16	1.16	1.16	0.00
A104												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	59.1	37.2	38.6	1.4	16.57	12.42	12.49	0.06	1.24	1.16	1.17	0.01
10	42.2	27.4	28.1	0.7	15.80	11.96	11.99	0.03	1.16	1.12	1.12	0.00
20	36.2	24.0	24.4	0.5	15.50	11.79	11.81	0.02	1.13	1.10	1.10	0.00
50	30.5	20.7	20.9	0.2	15.21	11.62	11.63	0.01	1.10	1.08	1.08	0.00

100	28.0	19.3	19.4	0.1	15.08	11.55	11.56	0.01	1.09	1.07	1.07	0.00
150	27.0	18.7	18.8	0.1	15.04	11.52	11.53	0.01	1.08	1.07	1.07	0.00
200	26.6	18.5	18.6	0.1	15.01	11.51	11.51	0.00	1.08	1.07	1.07	0.00

Option C

Theydon Road												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	41.3	26.5	26.8	0.3	15.48	11.81	11.83	0.02	1.22	1.19	1.19	0.00
10	34.9	22.4	22.6	0.2	15.16	11.61	11.62	0.01	1.18	1.17	1.17	0.00
20	32.8	21.1	21.2	0.1	15.06	11.55	11.55	0.01	1.17	1.16	1.16	0.00
50	31.0	20.0	20.0	0.1	14.96	11.49	11.49	0.00	1.16	1.16	1.16	0.00
100	30.2	19.5	19.6	0.0	14.92	11.46	11.46	0.00	1.16	1.16	1.16	0.00
150	30.0	19.4	19.4	0.0	14.91	11.45	11.46	0.00	1.16	1.15	1.15	0.00
200	29.9	19.3	19.3	0.0	14.91	11.45	11.45	0.00	1.16	1.15	1.15	0.00
A121 between Wake Arms Roundabout and M25												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	92.1	55.0	56.4	1.4	17.77	13.13	13.19	0.06	1.36	1.24	1.24	0.01
10	60.0	36.9	37.6	0.7	16.47	12.34	12.37	0.04	1.23	1.16	1.16	0.00
20	48.6	30.4	30.9	0.5	15.95	12.03	12.06	0.02	1.17	1.12	1.13	0.00
50	37.8	24.4	24.6	0.3	15.43	11.74	11.75	0.01	1.12	1.09	1.09	0.00
100	32.8	21.7	21.8	0.2	15.19	11.60	11.61	0.01	1.10	1.08	1.08	0.00
150	30.9	20.6	20.7	0.1	15.09	11.55	11.55	0.00	1.09	1.07	1.07	0.00
200	29.9	20.1	20.1	0.1	15.04	11.52	11.53	0.00	1.08	1.07	1.07	0.00

B1393												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	59.6	38.5	39.8	1.4	16.60	12.51	12.57	0.06	1.24	1.17	1.18	0.01
10	43.0	28.2	28.9	0.7	15.84	12.02	12.06	0.04	1.16	1.12	1.13	0.00
20	36.7	24.3	24.8	0.5	15.54	11.83	11.86	0.03	1.13	1.10	1.11	0.00
50	30.7	20.6	20.8	0.3	15.24	11.64	11.66	0.01	1.10	1.08	1.09	0.00
100	28.0	18.9	19.1	0.1	15.10	11.56	11.57	0.01	1.09	1.08	1.08	0.00
150	27.0	18.3	18.4	0.1	15.05	11.53	11.53	0.01	1.08	1.07	1.07	0.00
200	26.5	18.0	18.1	0.1	15.02	11.51	11.52	0.00	1.08	1.07	1.07	0.00
A104												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	59.1	37.2	38.8	1.5	16.57	12.42	12.49	0.07	1.24	1.16	1.17	0.01
10	42.2	27.4	28.2	0.8	15.80	11.96	11.99	0.04	1.16	1.12	1.12	0.00
20	36.2	24.0	24.5	0.5	15.50	11.79	11.81	0.03	1.13	1.10	1.10	0.00
50	30.5	20.7	21.0	0.3	15.21	11.62	11.64	0.01	1.10	1.08	1.08	0.00
100	28.0	19.3	19.4	0.2	15.08	11.55	11.56	0.01	1.09	1.07	1.07	0.00
150	27.0	18.7	18.8	0.1	15.04	11.52	11.53	0.01	1.08	1.07	1.07	0.00
200	26.6	18.5	18.6	0.1	15.01	11.51	11.51	0.00	1.08	1.07	1.07	0.00

Option D

Theydon Road												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	41.3	26.5	26.6	0.1	15.48	11.81	11.82	0.00	1.22	1.19	1.19	0.00
10	34.9	22.4	22.5	0.0	15.16	11.61	11.61	0.00	1.18	1.17	1.17	0.00
20	32.8	21.1	21.2	0.0	15.06	11.55	11.55	0.00	1.17	1.16	1.16	0.00
50	31.0	20.0	20.0	0.0	14.96	11.49	11.49	0.00	1.16	1.16	1.16	0.00
100	30.2	19.5	19.5	0.0	14.92	11.46	11.46	0.00	1.16	1.16	1.16	0.00
150	30.0	19.4	19.4	0.0	14.91	11.45	11.46	0.00	1.16	1.15	1.15	0.00
200	29.9	19.3	19.3	0.0	14.91	11.45	11.45	0.00	1.16	1.15	1.15	0.00
A121 between Wake Arms Roundabout and M25												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	92.1	55.0	56.0	1.0	17.77	13.13	13.18	0.04	1.36	1.24	1.24	0.00
10	60.0	36.9	37.4	0.5	16.47	12.34	12.36	0.02	1.23	1.16	1.16	0.00
20	48.6	30.4	30.8	0.3	15.95	12.03	12.05	0.02	1.17	1.12	1.13	0.00
50	37.8	24.4	24.6	0.2	15.43	11.74	11.75	0.01	1.12	1.09	1.09	0.00
100	32.8	21.7	21.8	0.1	15.19	11.60	11.61	0.01	1.10	1.08	1.08	0.00
150	30.9	20.6	20.7	0.1	15.09	11.55	11.55	0.00	1.09	1.07	1.07	0.00
200	29.9	20.1	20.1	0.1	15.04	11.52	11.52	0.00	1.08	1.07	1.07	0.00
B1393												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	65.8	41.3	42.2	0.8	16.60	12.52	12.55	0.04	1.33	1.26	1.27	0.00
10	47.5	30.1	30.5	0.4	15.78	11.99	12.01	0.02	1.25	1.21	1.21	0.00
20	41.1	26.2	26.4	0.3	15.47	11.80	11.81	0.01	1.21	1.19	1.19	0.00

50	35.0	22.4	22.5	0.1	15.17	11.61	11.61	0.01	1.18	1.17	1.17	0.00
100	32.3	20.7	20.8	0.1	15.03	11.52	11.53	0.00	1.17	1.16	1.16	0.00
150	31.2	20.1	20.1	0.1	14.98	11.49	11.49	0.00	1.16	1.16	1.16	0.00
200	30.7	19.8	19.8	0.0	14.95	11.48	11.48	0.00	1.16	1.16	1.16	0.00
A104												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	59.1	37.2	38.3	1.1	16.57	12.42	12.47	0.05	1.24	1.16	1.17	0.01
10	42.2	27.4	27.9	0.5	15.80	11.96	11.98	0.03	1.16	1.12	1.12	0.00
20	36.2	24.0	24.3	0.4	15.50	11.79	11.80	0.02	1.13	1.10	1.10	0.00
50	30.5	20.7	20.9	0.2	15.21	11.62	11.63	0.01	1.10	1.08	1.08	0.00
100	28.0	19.3	19.4	0.1	15.08	11.55	11.55	0.01	1.09	1.07	1.07	0.00
150	27.0	18.7	18.8	0.1	15.04	11.52	11.53	0.00	1.08	1.07	1.07	0.00
200	26.6	18.5	18.5	0.1	15.01	11.51	11.51	0.00	1.08	1.07	1.07	0.00

Option E

Theydon Road												
	Annual Mean Nox Conc. (ug/m3)				**Annual Mean N Dep (k N/ha/yr)**				**Annual Mean A Dep (keq/ha/yr)**			
Distance (m)	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**	**BL**	**DM**	**DS**	**Change**
1	41.3	23.3	23.5	0.2	15.48	10.21	10.22	0.01	1.22	1.18	1.18	0.00
10	34.9	20.2	20.3	0.1	15.16	10.06	10.06	0.00	1.18	1.17	1.17	0.00
20	32.8	19.2	19.3	0.1	15.06	10.01	10.01	0.00	1.17	1.16	1.16	0.00
50	31.0	18.3	18.3	0.0	14.96	9.96	9.97	0.00	1.16	1.16	1.16	0.00
100	30.2	17.9	18.0	0.0	14.92	9.95	9.95	0.00	1.16	1.15	1.15	0.00
150	30.0	17.8	17.9	0.0	14.91	9.94	9.94	0.00	1.16	1.15	1.15	0.00
200	29.9	17.8	17.8	0.0	14.91	9.94	9.94	0.00	1.16	1.15	1.15	0.00

A121 between Wake Arms Roundabout and M25												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	92.1	45.2	46.4	1.3	17.77	11.22	11.27	0.05	1.36	1.20	1.20	0.01
10	60.0	31.3	32.0	0.7	16.47	10.61	10.64	0.03	1.23	1.13	1.14	0.00
20	48.6	26.4	26.8	0.4	15.95	10.37	10.39	0.02	1.17	1.11	1.11	0.00
50	37.8	21.7	22.0	0.2	15.43	10.15	10.16	0.01	1.12	1.08	1.09	0.00
100	32.8	19.7	19.8	0.1	15.19	10.05	10.05	0.01	1.10	1.07	1.08	0.00
150	30.9	18.9	19.0	0.1	15.09	10.01	10.01	0.01	1.09	1.07	1.07	0.00
200	29.9	18.5	18.5	0.1	15.04	9.99	9.99	0.00	1.08	1.07	1.07	0.00
B1393												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	59.6	32.4	33.4	1.0	16.60	10.74	10.79	0.05	1.24	1.15	1.15	0.00
10	43.0	24.5	25.0	0.5	15.84	10.37	10.39	0.03	1.16	1.11	1.11	0.00
20	36.7	21.5	21.8	0.4	15.54	10.22	10.24	0.02	1.13	1.09	1.09	0.00
50	30.7	18.6	18.8	0.2	15.24	10.08	10.09	0.01	1.10	1.08	1.08	0.00
100	28.0	17.3	17.5	0.1	15.10	10.02	10.02	0.01	1.09	1.07	1.07	0.00
150	27.0	16.9	17.0	0.1	15.05	9.99	10.00	0.00	1.08	1.07	1.07	0.00
200	26.5	16.7	16.7	0.1	15.02	9.98	9.99	0.00	1.08	1.07	1.07	0.00
A104												
	Annual Mean Nox Conc. (ug/m3)				Annual Mean N Dep (k N/ha/yr)				Annual Mean A Dep (keq/ha/yr)			
Distance (m)	BL	DM	DS	Change	BL	DM	DS	Change	BL	DM	DS	Change
1	59.1	31.6	32.8	1.2	16.57	10.67	10.73	0.06	1.24	1.14	1.14	0.01
10	42.2	24.0	24.6	0.6	15.80	10.32	10.35	0.03	1.16	1.10	1.11	0.00
20	36.2	21.4	21.8	0.4	15.50	10.19	10.21	0.02	1.13	1.09	1.09	0.00
50	30.5	18.9	19.1	0.2	15.21	10.06	10.07	0.01	1.10	1.08	1.08	0.00

100	28.0	17.8	17.9	0.1	15.08	10.01	10.01	0.01	1.09	1.07	1.07	0.00
150	27.0	17.4	17.5	0.1	15.04	9.99	9.99	0.00	1.08	1.07	1.07	0.00
200	26.6	17.2	17.2	0.1	15.01	9.98	9.98	0.00	1.08	1.07	1.07	0.00

Interpretation

The key interpretation of the preceding tables is as follows:

1. There is relatively little difference between any of the Options. This is probably because all the Options have the same broad distribution for new housing i.e. clustered around Harlow, even though they vary in quantum and detailed distribution.

2. For all Options and all roads other than Theydon Road, there would be an increase in NOx concentration up to 10-20m from the roadside (depending on link modelled) that would be greater than 1% of the Critical Level. This varies from 0.4 μgm^{-3} (1.3% of the Critical Level) at the furthest distance, up to a maximum of 1.5 μgm^{-3} (5% of the Critical Level) immediately adjacent to the A104 under Option C. DMRB Interim Advice Note 174/12[61] classifies this as a 'small' change (which it defines in line with Institute of Air Quality Management practice as a change equivalent to 5% of the critical level or less). However, since it is over 1% of the Critical Level the contribution of the Options cannot be dismissed as imperceptible. It is therefore necessary to consider the implications of the elevated NOx. This is done by examining the resultant nitrogen and acid deposition, since these are the two primary pathways for NOx to affect vegetation (whether ground-based or epiphytic).

3. The calculations reported in the tables above indicate that no modelled Option results in a change in nitrogen or acid deposition rate equivalent to (or even close to) 1% of the Critical Load on any road link. Therefore, it is possible to conclude in line with DMRB and AQTAG guidelines that all Options would make an imperceptible or inconsequential contribution to local nitrogen and acid deposition within Epping Forest SAC. Due to the ability to reach this conclusion it is not necessary to undertake an assessment of nitrogen deposition or acid deposition 'in combination' with other projects and plans because, as per DMRB and AQTAG, a contribution of less than 1% is so small that it is considered never to have a likely significant effect even in combination with other projects and plans. Not all NOx is deposited near the roadside; much is converted to other chemicals and/or dispersed more widely before being deposited. Therefore, the degree of change in nitrogen and acid deposition at a given distance from the roadside is always much smaller than the accompanying change in NOx concentrations.

4. The change in NOx concentrations at the roadside on several road links is predicted to be greater than 1% of the critical level (in the worst case, up to 5% of the critical level). Therefore, these cannot be described as imperceptible and require consideration 'in combination'. This is essentially achieved by examining the total Do Something NOx concentrations, as the Do Something scenario incorporates all expected future development including currently unimplemented planning permissions, plus background traffic growth. As per footnote 68, the Critical Level for NOx is set at 30 μgm^{-3} to capture the role of NOx in nitrogen deposition and particularly in growth effects. If nitrogen deposition due to a scheme can be dismissed as imperceptible even in combination, then whether the expected total NOx concentration is over 30 μgm^{-3} or not ceases to be particularly important and attention should be paid to other effects of NOx that may arise other than through its role as a source of nitrogen. These may include biochemical effects e.g. enzyme activity, chlorophyll content and physiological effects e.g. CO_2 assimilation or stomatal conductivity, although many of these changes

[61] The Design Manual for Roads and Bridges (Interim Advice Note 174/12 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07))

may still be due to increased nitrogen rather than other effects of the gas such as acidity. Based on those studies, the physiological and biochemical effects of NOx do not appear to occur until much higher annual concentrations are reached. Even in epiphytic plants, no research has been sourced that indicates effects, other than via nitrogen, at lower concentrations. This is reflected in WHO (2000) which states that the '*general effect threshold … would be substantially higher if biomass production* [i.e. growth stimulation] *of crops is not assumed to be an adverse effect'*.[62] Reference to the data provided within the WHO report suggests that exposure to annual average concentrations below 100 μgm^{-3} are unlikely to cause direct biochemical or physiological effects based on the available studies and it may be that concentrations considerably above 100 μgm^{-3} would be required in the field before an effect was observed. From the tables above, the highest 'in combination' (Do Something) 2033 NOx concentration predicted on the modelled links from these Options is 56.5 μgm^{-3} immediately adjacent to the A121 between the Wake Arms Roundabout and the M25. This is certainly high enough for nitrogen deposition to be well above the minimum critical load but is well below the likely minimum NOx concentration at which other effects, unrelated to growth stimulation and nitrogen deposition, are likely to occur.

In summary therefore, based on the traffic flow data for the modelled links and using the criteria set by AQTAG, it can be concluded that there will be no adverse effect on the integrity of Epping Forest SAC from either option, either alone or in combination with other plans and projects.

However, it can also be seen from these tables that, even allowing for some improvement in background air quality to 2033 from improved emissions technology, the total nitrogen deposition rates adjacent to all modelled links will reach, or exceed, the lowest point of the currently used critical load range for Epping Forest SAC. As such, while the modelling indicates that none of the HMA Options can be 'blamed' for making a significant contribution to the future elevated nitrogen deposition rates, when all traffic is taken together there clearly will remain potential for a continued negative effect on the SAC by 2033. Therefore, while it may not be required as 'mitigation' it is considered appropriate that the HMA authorities pursue the Memorandum of Understanding and use it as a basis to work cooperatively with The Corporation of London, Natural England and other partners to achieve material improvements in air quality and nitrogen inputs to Epping Forest SAC by 2033, such as through delivery of the Forest Transport Plan and Forest Nitrogen Action Plan.

[62] WHO Regional Office for Europe, Copenhagen, Denmark, 2000. Air Quality Guidelines – Second Edition. Chapter 11

About AECOM

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