

Tunbridge Wells Borough: Ashdown Forest Air Quality Impact Assessment 2018

Traffic-Related Effects on Ashdown Forest SAC

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Rev No	Comments	Date
1	First issue	17/11/17
2	Revised issue	03/03/18
3	Final issue	20/03/18

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March 2018

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1 Introduction

- 1.1.1 Ashdown Forest is an extensive area of common land lying between East Grinstead and Crowborough entirely within Wealden District. The soils are derived from the predominantly sandy Hastings Beds. It is one of the largest single continuous blocks of heath, semi-natural woodland and valley bog in south-east England, and it supports several uncommon plants, a rich invertebrate fauna, and important populations of heath and woodland birds. It is both a Special Area of Conservation (SAC) and Special Protection Area (SPA)
- 1.1.2 The SPA is designated for its populations of breeding Dartford Warbler *Sylvia undata* and Nightjar *Caprimulgus europaeus*. The SAC is designated for its Annex I habitats, namely Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths; as well as for its Annex II species, namely Great Crested Newts.
- 1.1.3 Exhaust emissions from vehicles are capable of adversely affecting the protected heathland found in Ashdown Forest. Accordingly, in September 2017 AECOM undertook an air quality impact assessment for Lewes District Council and South Downs National Park Authority, which modelled forecast traffic growth on key roads within 200m of Ashdown Forest SAC over the period 2017 to 2033, including that expected due to the quantum and distribution of growth in the adopted Lewes Joint Core Strategy (as it relates to Lewes District outside the South Downs National Park) and the South Downs Local Plan. Tunbridge Wells Borough Council subsequently commissioned AECOM to use the same traffic and air quality models to undertake an analysis for the emerging Tunbridge Wells Local Plan. Sevenoaks District Council also commissioned an analysis.
- 1.1.4 The methodology used in this analysis is compliant with the requirement of the Conservation of Habitats and Species Regulations 2017 to consider whether an adverse effect on the integrity of a European site will result either alone, or in combination with other plans and projects.
- 1.1.5 In addition to determining the total cumulative 'in combination' effect on roadside air quality at Ashdown Forest SAC, the calculations presented in this analysis also consider the contribution of Tunbridge Wells Local Plan to that 'in combination' effect. This is necessary to determine whether the contribution is ecologically material and thus whether mitigation of that contribution is required.

2 Methodology

- 2.1.1 Vehicle exhaust emissions generally only have a local effect within a narrow band along the roadside, within 200m of the centreline of the road. Beyond 200m emissions are considered to 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.
- 2.1.2 There are two measures of particular relevance regarding air quality impacts from vehicle exhausts and which are modelled using standard forecasting. The first is the concentration of oxides of nitrogen (known as NO_x) in the atmosphere. In extreme cases NO_x can be directly toxic to vegetation but its main importance is as a source of nitrogen, which is then deposited on adjacent habitats. The guideline atmospheric concentration advocated by Government for the protection of vegetation is 30 micrograms per cubic metre ($\mu\text{g m}^{-3}$), known as the Critical Level, as this concentration relates to the growth effects of nitrogen derived from NO_x on vegetation.
- 2.1.3 The second important metric is a measure of the rate of the resulting nitrogen deposition. The addition of nitrogen is a form of fertilization, which can have a negative effect on heathland and other habitats over time by encouraging more competitive plant species that can force out the less competitive species that are more characteristic. Unlike NO_x 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 (APIS) website (www.apis.ac.uk) and is expressed as a quantity (kilograms) of nitrogen over a given area (hectare) per year ($\text{kgNha}^{-1}\text{yr}^{-1}$).
- 2.1.4 A third pollutant included in this assessment is ammonia emissions from traffic. In ecological terms ammonia differs from NO_x in that it is not only a source of nitrogen but can also be directly toxic to vegetation in relatively low concentrations. Using the process set out in Design Manual for Roads and Bridges, ammonia emissions for traffic are not normally calculated. However, for completeness, and in response to representations made by Wealden District Council, they have been included in this iteration of AECOM's modelling, both in terms of atmospheric concentrations and as a source of nitrogen.
- 2.1.5 Finally, and 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.

2.2 Traffic modelling

- 2.2.1 A series of road links within 200m of Ashdown Forest Special Area of Conservation (SAC) were identified for investigation. These links were chosen as they are all representative points on the busiest roads through the SAC and are also the roads likely to experience the greatest increase in flows over the period to 2033. As such, these are the roads where an air quality effect due to additional traffic growth is most likely to be observed.
- 2.2.2 Traffic data were generated for each of these links for three scenarios, described in this report as:
- Base Case
 - Do Nothing (DN)
 - Do Something (DS)
- 2.2.3 The Base Case uses measured flows, percentage Heavy Duty Vehicles (HDVs) and average vehicle speeds on the relevant links, as provided by Wealden District Council (WDC). The Wealden traffic counts were for 2014 (either undertaken in that year, or adjusted to that year). For the purposes of consistency with wider traffic modelling used to inform the Habitat Regulations Assessment (HRA) of the South Downs Local Plan, which use measured traffic counts from 2017, these data were 'grown' by AECOM transport planners to 2017. Since the

emerging Sevenoaks Local Plan is backdated to 2015, the emerging South Downs Local Plan and emerging Tunbridge Wells Local Plan to 2014 and the Joint Core Strategy to 2010, this means that housing and employment development that has been delivered and occupied prior to 2017 is allowed for in the measured baseline flows. However, this is also true for all other local authorities, so there is no disparity in treatment of local authorities in the modelling. Development that has been consented but not actually completed/occupied does not appear in the baseline flows.

- 2.2.4 The Do Nothing scenario is the term used in this report to describe the future flows on the same roads at the end of the Tunbridge Wells Local Plan period (2033), without consideration of the role of the Tunbridge Wells Local Plan, South Downs Local Plan, Sevenoaks Local Plan or Lewes Joint Core Strategy. This therefore presents the expected contribution of other plans and projects to flows by 2033, outside these four authorities. The end of the Local Plan period has been selected for the future scenario as this is the point at which the total emissions due to Tunbridge Wells Local Plan/Sevenoaks Local Plan/South Downs Local Plan/JCS traffic will be at their greatest. The scenario is calculated by extrapolating the observed traffic data. The Do Nothing scenario adds all traffic growth from 2017 to 2033 that will result in additional journeys on the modelled road links.
- 2.2.5 For the purposes of 'in combination' assessment (i.e. incorporating growth into the model due to multiple Local Plans and Core Strategies for surrounding authorities) it was decided that modelling the adopted Local Plans directly would not reflect actual housing growth in those authorities between 2017 and 2033 because:
1. Since most commence in 2006 they include a large number of allocations that are historic (i.e. already delivered and occupied) and these are already part of the measured base flows.
 2. Adopted plans for these authorities may not accurately reflect growth over the period 2017 to 2033 because, with the exception of Lewes Joint Core Strategy, all the adopted plans for the boroughs/districts immediately around Ashdown Forest SAC finish seven years before the South Downs Local Plan, which runs to 2033 whereas the adopted plans (other than the Lewes JCS) all run to 2026 or 2027. This means that there will be 6-7 years of growth which is not covered by most adopted plans.
- 2.2.6 Expected development in these authorities over the period 2017 to 2033 was therefore included in the model by using the National Trip End Model Presentation Program (TEMPRO). TEMPRO produces a growth factor that is applied to the measured flows. It is based on data for each local authority district in the UK (distributed by statistical Middle Layer Super Output Area¹) regarding future changes in population, households, workforce and employment (in addition to data such as car ownership) but is not limited to a given period of time. Traffic growth factors are utilised for the statistical Middle Layer Super Output Areas (MSOAs) within which the modelled links are located. TEMPRO has the advantages of being forecastable to 2033 and beyond, using growth assumptions that are regularly updated and distributed to the level of Middle-Layer Super Output Area (of which there are 21 in Wealden District alone) and of being an industry standard database tool across England meaning that modelling exercises that use TEMPRO will have a high degree of consistency.
- 2.2.7 The other authorities immediately surrounding Ashdown Forest are those in which development is most likely to influence annual average daily traffic flows through the SAC. For those authorities (Wealden, Mid-Sussex and Tandridge) scrutiny of the relevant adopted Local Plans or Core Strategies and the associated housing growth rates in TEMPRO resulted in the conclusion that the adopted plans (and TEMPRO) may currently underestimate growth to 2033 and this could in turn materially affect the estimation of 2033 AADT flows on the relevant roads. The decision was therefore made to raise the growth allowances for these authorities to reflect their most recent Objectively Assessed Need (OAN) at time of traffic modelling². The OAN figure was

¹ Middle Layer Super Output Areas are a geographical hierarchy designed to improve the reporting of small area statistics in England and Wales. They are a series of areas each of which has a minimum population of 5,000 residents. They have a mean population of 7,200 residents.

² Note that the Objectively Assessed Need figures in the Do Nothing component of the model date from June 2017. For Wealden District this broadly matches the growth rates that authority has used in its own modelling. In September 2017 the Government released a new Objectively Assessed Housing Need for each local authority. Other than Tunbridge Wells and Sevenoaks (whose elevated OAN is taken into account in this updated modelling), only 1 of the relevant authorities has a higher OAN using the Government method than the figure used in the previous Do Nothing modelling: Tandridge's OAN increases from 470 to 645. On the other hand, two of the authorities modelled in Do Nothing have OAN's lower than those used in the model (Wealden and Mid-Sussex). Therefore, given that the Government method is still out to

derived from published information released by the Councils themselves or (in the case of Mid-Sussex) by their Local Plan inspector. Although housing growth rates were adjusted upwards, expected broad housing distributions were not altered. Employment growth assumptions in TEMPRO for these authorities were not adjusted. The authorities and their quanta and broad distributions of housing growth as considered in our analysis are as follows:

- Wealden** – Adopted Local Plan Core Strategy Policy WCS1 specifies delivery of 4,525 dwellings over the period 2010 to 2027 (266 per annum). A new draft Local Plan has been consulted upon but is currently being updated and revised. Growth in Uckfield and Crowborough (as well as smaller settlements around the SAC such as Maresfield) is most likely to affect flows through the SAC, although development across the district is likely to contribute cumulatively. At Uckfield *'The [adopted] Local Plan will allow for a redevelopment of the towns retail centre providing some 10,000 m² of new retail space as well as the creation of 12,650 m² of employment space. It limits to 1000 the number of new homes to be built between now and 2027, and identifies Ridgewood as the most sustainable place for the growth needed to support the vibrancy of the town'*.³ The main focus of growth at Uckfield is an urban extension to the west of the town. At Crowborough: *'Wealden's [adopted] Core Strategy Local Plan, approved in 2012, allows for a significant amount of new housing in Crowborough, with supporting office space and commercial premises within the town at appropriate locations. It will see some 450 new houses built in existing settlements across Wealden each year up until 2027... Within Crowborough the Local Plan allows for some 140 new homes to be built in the town at Pine Grove and Jarvis Brook. It also allows for 160 new homes to be built in an urban extension to the south east of the town.'*⁴ The most recent Objectively Assessed Need for Wealden is 832 dwellings per annum. Since this is a substantial difference from that in the published Core Strategy the higher rate was used in the model, although it is accepted that this may overestimate the scale of growth that the next iteration of Wealden Local Plan actually proposes for the district.
- Mid-Sussex** – The submitted Local Plan (2014 – 2031) plans for 13,600 dwellings (800 dwellings per annum). A large part of the housing and employment development is intended to consist of a new strategic development (3,500 dwellings) north of Burgess Hill, 13km south-west of the SAC, as well as existing commitments in that same settlement. The submitted plan also proposes 600 dwellings at Pease Pottage, 12km west of the SAC and smaller levels of growth elsewhere. Housing in East Grinstead (and to a lesser extent Haywards Heath) is most likely to be relevant to flows through Ashdown Forest as East Grinstead lies on the A22 approximately 4km north of the SAC. These are both Category 1 settlements in the Local Plan's hierarchy and can therefore be expected to take a sizeable proportion of the dwellings expected to be allocated 'elsewhere in the district' over the plan period according to policy DP5. During the plan's Examination in Public, the Inspector identified in February 2017 that he was minded to increase the growth rate from 800 per annum to 1,026 per annum. Although it is now understood that number may be reduced, the 1,026 figure has been used in this analysis to be precautionary.
- Tandridge** – The adopted Core Strategy expects 2,500 dwellings from 2006 to 2026 at an average rate of 125 dwellings per annum. The majority of development will take place within the existing built up areas of Caterham, Warlingham, Whyteleafe, Oxted and Hurst Green. The new Local Plan is in the early stages of development (broad strategy published in March 2017 but no information on detailed scale or location of growth) with a forthcoming Garden Village consultation in autumn 2017. The most recent Objectively Assessed Need for Tandridge is 470 dwellings per annum. Since this is a substantial difference from that in the published Core Strategy the higher rate was used in the model as a precaution, although it is accepted that the level of growth in the final Local Plan for Tandridge may be less than this number. Tandridge are currently considering the location of a new Garden Village but the

consultation, and for consistency with the previous Lewes/South Downs work, the housing growth rates for Tandridge, Mid-Sussex and Wealden have been left as per the South Downs/Lewes model.

³http://www.wealden.gov.uk/Wealden/Residents/Planning_and_Building_Control/Planning_Policy/CoreStrategy/Planning_Core_Strategy_Uckfield.aspx (accessed 05/09/17)

⁴http://www.wealden.gov.uk/Wealden/Residents/Planning_and_Building_Control/Planning_Policy/CoreStrategy/Planning_Core_Strategy_Crowborough.aspx (accessed 05/09/17)

location is not determined at this point and therefore no specific location for this Garden Village was included in the modelling.

- 2.2.8 The Do Nothing (and thus Do Something) Scenario is therefore intentionally precautionary and allows for growth over the period to 2033 beyond that in adopted (or even published draft) Local Plans in those authorities immediately surrounding Ashdown Forest SAC. Both scenarios assume a consistent rate of housing delivery over the plan period. It is understood that a Statement of Common Ground is being produced between the various authorities around Ashdown Forest and included in that SoCG are detailed proposals for future modelling regarding traffic numbers that should be assumed. However, that agreement is still in progress and the traffic modelling used in this report was undertaken before that aspect of the agreement was devised. Therefore, this modelling may overestimate growth rates in some authorities, particularly Mid-Sussex District.
- 2.2.9 TEMPRO provides a consistent and standard approach to traffic forecasting when a large number of sources (e.g. local authority areas) are involved. However, a more nuanced forecast can be obtained by creating a bespoke model that manually distributes trips according to journey to work data. This approach provides a better understanding of where traffic associated with the proposed Local Plan development is likely to be most concentrated. Tunbridge Wells Borough Council therefore commissioned AECOM to extend the bespoke model already created for Lewes District, Sevenoaks District Council and South Downs National Park to cover Tunbridge Wells Borough. At this point, Tunbridge Wells Borough Council are at an early stage of plan development and therefore do not have definitive site allocations. However, they do have an Objectively Assessed Need and provided guidance on an appropriate broad distribution of development across the Borough, which was broken down into a number of sectors for traffic modelling purposes. AECOM was asked to model a housing delivery rate of 790 dwellings per annum in Tunbridge Wells Borough, including a possible 5,500 dwellings new settlement along the A21 between Pembury and Kippings Cross⁵.
- 2.2.10 In order to update the bespoke AECOM model, growth due to Tunbridge Wells Local Plan was essentially moved from the Do Nothing scenario (forecast using TEMPRO) to the Do Something scenario (forecast using the bespoke AECOM model). In order to minimise modelling artefacts that can be caused through moving growth between scenarios in new model runs, growth expected due to the JCS, Sevenoaks Local Plan and South Downs National Park Local Plan between 2017 and 2033 was left in the Do Something scenario. The 2033 Do Something scenario therefore includes bespoke modelling for Lewes District, Sevenoaks District, South Downs National Park and Tunbridge Wells Borough, although the relative contribution of Tunbridge Wells Borough to that Do Something forecast is identifiable.
- 2.2.11 The Do Something scenario reflects the combined role of the Tunbridge Wells Local Plan, Sevenoaks Local Plan, South Downs Local Plan, Lewes Joint Core Strategy and subsidiary Neighbourhood Plans by 2033, in addition to growth in other authorities. Detailed modelling of Local Plan/Neighbourhood Plan growth locations undertaken by the AECOM transport planning team was added to the adjusted TEMPRO growth for all other authorities. To build the Local Plan model, housing and employment sites in Tunbridge Wells, Sevenoaks District, Lewes District and the National Park (allocations in the Local Plan, Joint Core Strategy, allocations in Neighbourhood Plans, unimplemented planning permissions and windfall) were geographically assigned to 'distribution groups' across Tunbridge Wells Borough, Sevenoaks District, the National Park and Lewes District using GIS software. The distribution of each of these groups was calculated using Census 2011 journey to work data, and the trips associated with each distribution group then manually assigned across the network.
- 2.2.12 The 'in combination' growth scenario is therefore the Do Something flows, as these include existing traffic, all future journeys arising from within Tunbridge Wells Borough, the South Downs National Park, Sevenoaks District and Lewes District due to the Local Plan, Joint Core Strategy or Neighbourhood Plan proposals (from AECOM's model), and future traffic arising from all other authorities (from TEMPRO, adjusted for expected higher growth rates in some authorities). The difference between the Do Something scenario and the Do Nothing scenario illustrates the role of the Tunbridge Wells Local Plan, Sevenoaks Local Plan, JCS and South Downs Local Plan (and Neighbourhood Plans) in changing future flows compared to what would be expected without the Local Plan/Joint Core Strategy proposals.

⁵ This settlement and its location are not definitive since the plan is at an early stage of development. However, it was modelled as a worst-case since placing the new settlement further to the east of the borough would likely much reduce journey to work flows on the A26 through Ashdown Forest compared to that included in the AECOM model.

2.3 Air quality calculations

- 2.3.1 Using these scenarios and information on total traffic flow, average vehicle speeds and percentage Heavy Duty Vehicles (which influence the emissions profile), AECOM air quality specialists calculated expected NO_x concentrations, nitrogen deposition rates, ammonia concentrations and acid deposition rates at receptor points along each modelled road link. The predictions for NO_x and nitrogen deposition 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)⁶ for the assessment of impacts on sensitive designated ecosystems due to highways works⁷. Background data for NO_x and NO₂ were sourced from the Department of Environment, Food and Rural Affairs (Defra) background maps⁸. Background data for ammonia was sourced from monitoring undertaken at Ashdown Forest⁹.
- 2.3.2 The DMRB does not provide a method for forecasting ammonia emissions from traffic. A method has therefore been devised for this modelling. The methodology for this is presented in detail in Appendix D. The research undertaken in Ashdown Forest indicates that beyond 20m from the roadside ammonia contributions are expected to tend towards background and so the contribution of road sources would be limited beyond this point.
- 2.3.3 Given that the assessment year (2033) is a considerable distance into the future, it is important for the air quality calculations to take account of improvements in background air quality and vehicle emissions that are expected nationally over the plan period. Making an allowance for a realistic improvement in background concentrations and deposition rates is in line with the Institute of Air Quality Management (IAQM) position¹⁰ as well as that of central government¹¹. Background nitrogen deposition rates were sourced from the Air Pollution Information System (APIS) website¹². Although in recent years improvements have not kept pace with predictions, the general long-term trend for NO_x has been one of improvement (particularly since 1990) despite an increase in vehicles on the roads¹³. There is also an improving trend for nitrogen deposition, although the rate of improvement has been much lower than for NO_x¹⁴. The current DMRB guidance for ecological assessment suggests reducing nitrogen deposition rates by 2% each year between the base year and assessment year. However, due to some uncertainty as to the rate with which projected future vehicle emission rates and background pollution concentrations are improving, the precautionary assumption has been made in this assessment that not all improvements projected by DMRB (for nitrogen deposition) or Defra (for NO_x concentrations) will occur. With regards to background ammonia concentrations; as there is greater uncertainty associated with rates of improvement over time, background concentrations have been kept the same through all assessment years.
- 2.3.4 Therefore, the air quality calculations assume that conditions in 2023 (an approximate midpoint between the base year and the year of assessment) are representative of conditions in 2033 (the year of assessment). The effect on the 2033 data is equivalent to assuming a 0.75% per annum improvement in background NO_x concentrations and nitrogen deposition rates between 2017 and 2033. The approach of not assuming all projected improvements occur (known as Gap Analysis) 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 evolution of the vehicle fleet. No discussion is made in this analysis of the UK Government's recent decision to ban the sale of new petrol and diesel vehicles from 2040 since it would not affect the time period under consideration, but that announcement illustrates the general long-term direction of travel for

⁶ Design Manual for Roads and Bridges, HA207/07, Highways Agency

⁷ DMRB advocates a nitrogen deposition velocity of 0.1 cms⁻¹ for non-woodland vegetation and that velocity is therefore used in AECOMs modelling.

⁸ Air Quality Archive Background Maps. Available from: <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>

⁹ Ashdown Forest SAC, Air Quality Monitoring and Modelling, October 2017

¹⁰ http://www.iaqm.co.uk/text/position_statements/vehicle_NOx_emission_factors.pdf

¹¹ For example, The UK Government's recent national Air Quality Plan also shows expected improvements over the relevant time period (up to 2030) <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>

¹² Air Pollution Information System (APIS) www.apis.ac.uk

¹³ Emissions of nitrogen oxides fell by 69% between 1970 and 2015. Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579200/Emissions_airpollutants_statistical_release_2016_final.pdf [accessed 08/06/17]

¹⁴ Total nitrogen deposition (i.e. taking account of both reduced and oxidised nitrogen, ammonia and NO_x) decreased by 13% between 1988 and 2010. This is an improvement of 0.59% per annum on average.

roadside air quality in the UK and underlines that allowing for improvements in both vehicle emissions factors and background rates of deposition over long timescales is both appropriate and realistic.

- 2.3.5 Annual mean concentrations of NO_x were calculated at varied intervals back from each road link up to a maximum of 200m, with the closest distance being the closest point of the designated site to the road. Predictions were made using the latest version of ADMS-Roads using emission rates derived from the Defra Emission Factor Toolkit (version 8.0.1) which utilises traffic data in the form of 24-hour Annual Average Daily Traffic (AADT), %HDV and average speed. The tables in Appendix A present the calculated changes in NO_x concentration, nitrogen deposition and acid deposition 'in combination' (i.e. the difference between Do Something and the 2017 Base case) and the role played by Local Plan/Joint Core Strategy development compared to that which would occur in any case over the plan period (i.e. the difference between Do Something and Do Nothing).

Model verification

- 2.3.6 To assist in the verification of the AECOM model (produced December 2017) AECOM were provided with a partially redacted version of a report prepared for Wealden District Council by Air Quality Consultants ('AQC') (Ashdown Forest SAC, Air Quality Monitoring and Modelling, December 2017). This report provided grid references, distance to road (m) and NO₂/NO_x concentrations for a number of measurement locations. The measurement height of these diffusion tubes was not recorded in the AQC report and this has been taken as 2m to match the stated height of the Ammonia ALPHA samplers, which are also included within this report.
- 2.3.7 Using these diffusion tube data AECOM was able to model the latest version of the Ashdown Forest model (December 2017) which uses 2017 backgrounds based on the base year 2015 and the NO_x to NO₂ Calculator v6.1 for 2017 using All non-urban UK traffic for the local authority of Wealden.
- 2.3.8 This verification process calculated a model adjustment factor of 2.73¹⁵ with an RMSE of 4.2. The RMSE should ideally be within 10% of the relevant air quality criterion, but is acceptable where it is within 25% of the relevant air quality criterion, as is the case here¹⁶.

¹⁵ This adjustment factor (2.73) is higher than the main factors produced by AQC in their report. The modelling approach taken by AQC includes canyoning effects, time-varying emission profiles, CURED emission rates, terrain data and incorporates the effects of road gradient on NO_x emissions all of which may increase concentrations within close proximity to the road source where the verification diffusion tubes are located. It is also noted that the tube height of 2m is an assumption which would affect the overall factor if the tubes are at a different height.

¹⁶ Defra (2016), Local Air Quality Management Technical Guidance (TG16)

3 Results

3.1 Traffic modelling

- 3.1.1 The flows forecast by 2033, and how these differ between Do Nothing (without the Local Plans/JCS) and Do Something (*including* the Sevenoaks, Tunbridge Wells and South Downs Local Plans and the Lewes JCS) are presented overleaf.

Table 1. Traffic flow data used in the air quality modelling

A	B	C	D	E	F	G	H
Link ID	Link Description	Wealden Model Base 2014 AADT	2017 Base AADT	2033 DN AADT (traffic growth <u>excluding</u> Sevenoaks, Lewes, South Downs and Tunbridge Wells Local Plans)	2033 DS AADT (traffic growth <u>including</u> Sevenoaks, Lewes, South Downs and Tunbridge Wells Local Plans)	Difference between 2017 Base and DS (i.e. net traffic growth from 2017 to 2033)	Difference between DS and DN
6	A22 Royal Ashdown Forest Golf Course	11,480	11,509	12,887	13,167	1,658	280
33	A22 Wych Cross	12,340	12,371	13,852	14,009	1,638	157
34	A22 Nutley	11,360	11,389	12,752	12,915	1,526	163
37	A275 Wych Cross	4,530	4,542	5,085	5,413	871	328
38	A26 Poundgate	16,150	16,191	18,129	19,205	3,014	1,076

Table 2. Breakdown of Do Something scenario to show the relative contribution of Tunbridge Wells Borough to the change in flows between 2017 and 2033, expressed as AADT and as percentage of the difference between DS and DN

Link ID	Tunbridge Wells Local Plan (AADT)
6	0
33	0
34	0
37	69 AADT (21%)
38	542 AADT (50%)

The percentages in Table 2 can be applied to the difference between DS and DN in Appendix 1 to determine the relative contribution of Tunbridge Wells Local Plan to ammonia, NO_x, nitrogen deposition and acid deposition.

- 3.1.2 All links are forecast to experience an increase in traffic flows between 2017 and 2033 when all expected traffic growth sources (including the Tunbridge Wells Local Plan, Sevenoaks Local Plan, South Downs Local Plan, and Lewes JCS) are taken into account (Column G of Table 1).
- 3.1.3 It can be seen from Table 2 that, on most links, housing and employment delivery in Tunbridge Wells Borough is forecast to make little to no contribution in terms of Annual Average Daily Traffic, essentially because most roads through Ashdown Forest SAC do not constitute meaningful journey to work routes for residents of the Borough based on existing census data. The exception is the A26 at Poundgate where the model forecasts that the Tunbridge Wells Local Plan will be responsible for adding approximately 500 AADT to the total flows by 2033. Note that this traffic growth can be expected to occur incrementally over the plan period, matching the housing delivery trajectory.

3.2 Air quality calculations

Ammonia

- 3.2.1 Ammonia concentrations in atmosphere are discussed in this section. Ammonia as a source of nitrogen is discussed in the following section on nitrogen deposition.
- 3.2.2 There are two critical levels for ammonia in atmosphere, which represent the differing sensitivities of lower plants (lichens and mosses) and higher plants (all other vegetation) to the gas. The difference is because higher plants have a protective cuticle which makes them less vulnerable to the gas than lower plants. A judgment must be made over which is more appropriate in a given location. The lower critical level ($1 \mu\text{m}^{-3}$) is only appropriate to use in an HRA where the affected area within the modelled transect has a high lichen/bryophyte interest that is relevant to the integrity of the SAC habitat. Otherwise the higher critical level ($3 \mu\text{m}^{-3}$) is more appropriate. If concentrations are forecast to be below the critical level within the relevant part of the SAC then there is good reason to conclude no adverse effect will arise.
- 3.2.3 Heathlands can support a diverse terricolous lichen flora provided the sward is sufficiently open for colonisation. All heathland SACs therefore automatically have the lower critical level assigned to them on the UK Air Pollution Information System (www.apis.ac.uk) and APIS makes it clear that this is due to an *a priori* assumption of lichen/bryophyte interest somewhere in the site. However, APIS assigns critical levels to SACs fairly generically rather than basing the decision on location specific data. In practice there are many areas of heathland that do not support a diverse lichen flora, since management is very significant in influencing lichen diversity and abundance and closed dense swards are much less likely to support a terricolous lichen community than more open swards. In such cases the higher critical level of $3 \mu\text{m}^{-3}$ is a more appropriate reference threshold.
- 3.2.4 Some parts of Ashdown Forest SAC do support a diverse terricolous heathland lichen assemblage. However, Wealden District Council has produced habitat maps using Earth Observation (satellite imagery and airborne systems) and commissioned site vegetation surveys¹⁷. None of these data indicate the presence of a significant assemblage of terricolous heathland lichens adjacent to any of the modelled roads¹⁸ and such an assemblage would not be expected in these areas given the tall dense swards (including a high proportion of gorse, bracken, scrub and trees). This has been verified by site inspections undertaken by AECOM. Even in heathland that is not scrub and bracken encroached, diverse lichen assemblages will generally only occur where the sward is managed to keep it open to control dwarf shrub (i.e. heather) cover. As such, the higher critical level is considered more appropriate for the relevant roadside locations at Ashdown Forest SAC.
- 3.2.5 Bearing that in mind, modelling undertaken by Air Quality Consultants Ltd for Wealden District Council indicates that the $3 \mu\text{m}^{-3}$ critical level for these specific roadside locations is not exceeded and is not forecast to be exceeded. This is supported by AECOM's modelling (Appendix A). Therefore, using this critical level, no direct toxicity effects of ammonia are expected on the key habitats of the SAC, whether associated with traffic emissions or other sources such as agriculture.

¹⁷ Two interim ecological survey reports have been released so far, the most recent dated May 2016. These are available at http://www.wealden.gov.uk/Wealden/Residents/Planning_and_Building_Control/Planning_Policy/Evidence_Base/Planning_Evidence_Base_Habitat_Regulations_Assessment.aspx

¹⁸ Paragraph 3.3.2 of the 2015 interim botanical survey report for Ashdown Forest states that '*Varying amounts of bryophytes and lichens were recorded, with Cladonia present in some areas but not particularly prevalent along transects*'.

- 3.2.6 Nonetheless, for completeness, Table 3 below summarises the ammonia concentration results for both links relevant to Tunbridge Wells (A26 and A275) with reference to whether the lower critical level ($1 \mu\text{m}^{-3}$) is forecast to be exceeded at the nearest area of heathland based on AECOM modelling.

Table 3. Summary of ammonia results for the nearest areas of heathland to each modelled link, with reference to the $1 \mu\text{m}^{-3}$ critical level for ammonia

Link/Transect	Nearest area of heathland	Summary of results by reference to the $1 \mu\text{m}^{-3}$ critical level
Transect 38: A26 at Poundgate	Approximately 40m from the road, although most is more distant. Intervening habitat is woodland.	2033 ammonia concentrations are forecast to fall below $1 \mu\text{m}^{-3}$ by 30m from the road
Transect 37W: A275 at Wych Cross	Extensive areas approximately 5m from the road. Area within 15m of the road unlikely to support terricolous lichens as vegetation is tall, dense and gorse encroached, providing a closed sward.	2033 ammonia concentrations are forecast to fall below $1 \mu\text{m}^{-3}$ by 5m from the road
Transect 37E: A275 at Wych Cross	Extensive areas approximately 5m from the road. Area within 15m of the road unlikely to support terricolous lichens as vegetation is tall, dense and gorse encroached, providing a closed sward.	2033 ammonia concentrations are forecast to fall below $1 \mu\text{m}^{-3}$ by 5m from the road
Transect 6b_37_33: junction of A22 and A275	No heathland within 200m of the road; woodland occupies this zone.	2033 ammonia concentrations are forecast to fall below $1 \mu\text{m}^{-3}$ by 50m from the road

- 3.2.7 It can be seen that even if one were to use a reference critical level of $1 \mu\text{m}^{-3}$ the nearest areas of heathland would not be affected.

Oxides of Nitrogen

- 3.2.8 Appendix A shows the annual mean NOx concentrations for the Baseline, Do Nothing scenario and Do Something Scenario. It also shows the 'Projected Baseline'. This is the modelled NOx concentrations in the hypothetical scenario of no traffic growth to 2033 but allowing for improvements in vehicle emissions for the existing traffic and an associated reduction in background nitrogen deposition. It is presented such that the additional NOx emissions due to traffic growth can be visually separated from the reduction in NOx concentrations due to the improving baseline. When assessing the likely effects of the planned growth in Tunbridge Wells Borough by 2033, it is necessary to consider: i) the additional NOx emissions caused by growth in the region (DS - Proj BL); ii) the contribution of Tunbridge Wells growth to the additional emissions; and iii) the overall change in annual mean NOx concentrations by 2033, taking into account improvements in vehicle emissions standards as applied to both existing and future traffic (DS - BL).
- 3.2.9 Based on background mapping, adjusted for the effect of the road, the air quality calculations provided in Appendix A show that the 2017 baseline NOx concentrations are modelled to be above the $30 \mu\text{gm}^{-3}$ general Critical Level for vegetation at the roadside along all transects except for the A275.
- 3.2.10 The additional NOx emissions due to traffic growth 'in combination' to any heathland along the A26 (column 'DS-ProjBL' in Appendix A) would be approximately $7 \mu\text{gm}^{-3}$ by 2033, although it would drop away quickly, falling nearly 50% by 5m from the road and falling further to $1.08 \mu\text{gm}^{-3}$ at the nearest area of heathland, approximately 40m from the A26. The contribution of Tunbridge Wells Local Plan to additional NOx at the closest part of the SAC to the A26¹⁹ is forecast to be $1.4 \mu\text{gm}^{-3}$, falling to $0.2 \mu\text{gm}^{-3}$ by the nearest area of heathland. However, improvements in NOx emission factors would also apply to the existing vehicle fleet. When a cautious allowance is made for improved emission factors applied to all traffic (existing and future), NOx is expected to remain above the critical level, but is forecast to experience a net *reduction* of c. $20 \mu\text{gm}^{-3}$ at the closest point of the SAC to the A26. The improvements in vehicle emission factors expected to

¹⁹ 50% of the modelled difference between Do Something and Do Nothing in Appendix A i.e. 50% of the value in the DS-DN column

2033 are thus forecast to more than offset the increase in NO_x from an increase in the volume of vehicle movements.

- 3.2.11 The same pattern is forecast at the roadside of the A275. At the closest point of the SAC to the A275 the additional NO_x emitted due to traffic growth 'in combination' by 2033 would be approximately 2 µg_m⁻³, although it would fall off quickly, dropping c. 50% by 5m from the roadside. The contribution of Tunbridge Wells Local Plan to NO_x²⁰ would be a minimal 0.15 µg_m⁻³ at the roadside, falling to 0.08 µg_m⁻³ by the nearest area of heathland, c.5m from the road. When forecast improvements in emission factors across the vehicle fleet are taken into account, NO_x at this location is actually forecast to experience a net reduction of c. 6 µg_m⁻³ by 2033.
- 3.2.12 In summary, by 2033, NO_x concentrations on all modelled links are forecast to experience a net reduction due to changes in vehicle emissions, notwithstanding the projected increase in traffic on the roads, including that attributable to the Tunbridge Wells Local Plan²¹. The greatest net improvement is forecast to occur at the roadside on the link with the highest flows (c. 20 µg_m⁻³ on the A26), while the smallest net improvement is forecast to occur at the roadside on the link with the lowest flows (c. 6 µg_m⁻³ on the A275).

Nitrogen deposition

- 3.2.13 Since the ecologically significant role of NO_x is as a source of nitrogen the next step is to consider what effect this may have on nitrogen deposition rates, and this also factors in the role of ammonia as a source of nitrogen.²² Calculating nitrogen deposition rates rather than relying purely on scrutiny of NO_x concentrations has the advantage of being habitat specific (the critical level for NO_x is entirely generic; in reality different habitats have varying tolerance to nitrogen) and of being directly relatable to measurable effects on the ground through scrutiny of published dose-response relationships that do not exist for NO_x. Only the A26 and A275 are specifically discussed below since these are the only roads on which an increase in AADT is forecast due to the Tunbridge Wells Local Plan.
- 3.2.14 As with NO_x, Appendix A shows the annual mean nitrogen deposition rates for the Baseline, Do Nothing scenario and Do Something Scenario. It also shows the 'Projected Baseline'. This is the modelled nitrogen deposition rates in the hypothetical scenario of no traffic growth to 2033 but allowing for improvements in vehicle emissions for the existing traffic and an associated reduction in background nitrogen deposition. It is presented such that the additional nitrogen deposition due to traffic growth can be visually separated from the reduction in nitrogen deposition due to the improving baseline. When assessing the likely effects of the planned growth in Tunbridge Wells Borough by 2033, it is necessary to consider: i) the additional nitrogen deposition caused by growth in the region (DS - Proj BL); ii) the contribution of Tunbridge Wells growth to the additional nitrogen; and iii) the overall change in annual mean nitrogen deposition rates by 2033, taking into account improvements in vehicle emissions standards as applied to both existing and future traffic (DS - BL).
- 3.2.15 Although much of Ashdown Forest SAC (including the borders of many roads) is covered with woodland and the habitat is a feature of the SSSI, woodland is not a notified feature of the internationally important wildlife sites. Ashdown Forest SAC is designated for its heathland and it is this habitat on which the birds of Ashdown Forest SPA depend. In order to undertake the nitrogen deposition modelling it is necessary to select an appropriate deposition velocity and background deposition rate. Since heathland is the SAC habitat appropriate deposition velocities for this habitat were used in the modelling since deposition to other habitats (e.g. woodland) is not relevant to the assessment.
- 3.2.16 Critical loads are always presented as a range, which for heathland is 10 kgN/ha/yr to 20 kgN/ha/yr²³. The lowest part of the nitrogen Critical Load range has been used in this assessment as that is the most precautionary stance to take. The baseline for nitrogen deposition to heathland along A26 and A275 is above the Critical Load and has been modelled to

²⁰ 21% of the modelled difference between Do Something and Do Nothing in Appendix A

²¹ Appendix C contains a technical note confirming that traffic emissions are expected to reduce year on year during the modelled plan period notwithstanding traffic growth over that same timetable; i.e. the improving trend is consistent throughout the plan period.

²² Acid deposition rates for all transects on all modelled links are expected to improve over the plan period and the contribution of the Tunbridge Wells Local Plan to any retardation of that improvement is effectively zero, in that any contribution is too small to show in the model (i.e. it would affect the third decimal place or beyond, which are never reported in modelling). Acid deposition is therefore not discussed further in this document.

²³ APIS advises to use the high end of the range with high precipitation and the low end of the range with low precipitation and to use the low end of the range for systems with a low water table, and the high end of the range for systems with a high water table.

be c.16-20 kgN/ha/yr at the closest points to the road, declining to 13-14 kgN/ha/yr by 200m from the road. Measured data suggests that against some road links actual deposition rates are considerably higher. The results relating to the nearest areas of heathland are summarised in Table 4 below.

Table 4. Total additional nitrogen deposition due to growth 'in combination' at closest area of heathland

Link/Transect	Nearest existing area of heathland	Summary of results 'in combination'
Transect 38: A26 at Poundgate	Approximately 40m from the road, although most is more distant.	0.16 kgN/ha/yr at 40m from the road (0.98 kgN/ha/yr at the roadside)
Transect 37W: A275 at Wych Cross	Extensive areas approximately 5m from the road.	0.16 kgN/ha/yr at 5m from the road (0.28 kgN/ha/yr at the roadside)
Transect 37E: A275 at Wych Cross	Extensive areas approximately 5m from the road.	0.15 kgN/ha/yr at 5m from the road (0.26 kgN/ha/yr at the roadside)
Transect 6b_37_33: junction of A22 and A275	No heathland within 200m of the road	N/A

3.2.17 At the closest areas of heathland to modelled links relevant to Tunbridge Wells (along the A275) the worst-case additional deposition due to extra traffic is forecast to be c. 0.3 kgN/ha/yr at the roadside, declining nearly 50% by 5m from the roadside. The contribution of Tunbridge Wells Local Plan to nitrogen deposition at the roadside of the A275 would be a negligible 0.02 kgN/ha/yr²⁴, falling to effectively zero by 10m from the road.

3.2.18 Most importantly, the DS-BL column in Appendix A shows that the deposition from additional traffic (irrespective of source) is forecast to be offset by a much larger reduction in background deposition expected over the same timescale. As a result a net *reduction* in deposition of 1.6-1.9 kgN/ha/yr (depending on link) is actually forecast at the roadside notwithstanding traffic growth²⁵.

Ecological significance

3.2.19 The modelling demonstrates that there will be a net decreasing trend in nitrogen deposition rates to heathland within the SAC along the modelled links. Accordingly, the Local Plans will not have significant in-combination effects on the SAC by way of contributing to any net increase in nitrogen deposition.

3.2.20 It is however worth considering whether the Local Plans could have a significant effect on the SAC as a result of retarding the improvement of nitrogen deposition rates, as paragraph 3.2.17 and the modelling in Appendix A identify that the forecast improvement in deposition rates to heathland would be slightly lower due to expected traffic growth than in the hypothetical situation of no further traffic growth (compare column DS, which is the forecast 2033 deposition rates including traffic growth, with column 'Proj BL', which is the forecast 2033 deposition rates if there were no traffic growth). Drawing a conclusion on this matter requires ecological interpretation to determine whether an abstract retardation of improvement in nitrogen deposition is likely to result in a real terms ecological impact.

3.2.21 Deposition of nitrogen can cause a variety of responses in heathland: transition from heather to grass dominance, decline in lichens (such as *Cladonia* species), changes in plant biochemistry and increased sensitivity to stress²⁶. The physical, measurable and observable manifestations of these responses are generally in terms of reduction in species richness²⁷, reduction in cover (or increase in grass cover) and resulting changes in broad habitat structure. These responses are not independent: for example, reduction in species richness can cause, and in turn be exacerbated by, changes in habitat structure. Note that 'reduction in species richness' only

²⁴ 21% of the modelled difference between Do Something and Do Nothing for this link in Appendix A

²⁵ If the actual current roadside deposition rates are substantially higher than that included in the AECOM model, the percentage reduction in nitrogen deposition rate by 2033 would be the same but the actual reduction in deposition rate would be much greater.

²⁶ Caporn, S., Field, C., Payne, R., Dise, N., Britton, A., Emmett, B., Jones, L., Phoenix, G., S Power, S., Sheppard, L. & Stevens, C. 2016. Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance. Natural England Commissioned Reports, Number 210. Table 1 page 2

²⁷ This is a good indicator of the effect of nitrogen deposition on vegetation as it arises at low background deposition rates, is easily detectable and occurs across different habitats. The exception appears to be calcareous grassland where there is no correlation between nitrogen deposition and species richness; for that habitat, rather than there being a reduction in the average number of species per quadrat the reduced frequency of less competitive species appears to be offset by the increased frequency of more competitive species.

means that fewer species are recorded in a randomly placed 2m x 2m quadrat. Therefore, it does not mean species are 'lost' from the affected area; it simply means that at least one species occurs at a reduced frequency²⁸; it is therefore a relatively subtle metric.

- 3.2.22 Critical Loads have been in use for a number of years and have been defined as: '*a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*'. However, more recent studies²⁹ comparing deposition rate with reduction in species richness and other parameters indicate that the response of habitats such as heathland to long-term nitrogen deposition is curved for most parameters, with some of the sharpest losses in diversity occurring below the critical load³⁰. Moreover, those studies also indicate that the effect on species richness of adding a given amount of nitrogen in many habitats is not simple, linear and additive as is often assumed (i.e. 'x' amount of further nitrogen equates to 'x' amount of vegetation effect irrespective of current nitrogen dose) but is heavily influenced by the existing nitrogen deposition rate. It has thus become clear that the response of vegetation to nitrogen deposition is more nuanced than the 'black and white' critical load concept suggests.
- 3.2.23 The amount of extra nitrogen needed to cause a measurable ecological effect has been shown from a range of studies on a range of sites to be considerably greater in lowland heathland subject to high existing deposition rates than it is in those with low existing deposition rates. This is true for most parameters, whether that effect is defined in terms of reduction in species richness, reduction in species cover, or probability of species presence³¹. The only metric for which this relationship appears not to be true is with regard to increases in grass cover³². Putting it simply, a small amount of additional nitrogen is much less likely to significantly affect a heathland already subject to high inputs than it is to affect one subject to low inputs. Ultimately, it is the predicted effect on the site vegetation (and thus its ability to achieve its conservation objectives) that is the key factor in determining whether there will actually be a significant effect i.e. an effect on the integrity of a site, rather than NO_x concentrations or nitrogen deposition rates in the abstract. Therefore, it is possible for an increase in nitrogen deposition to fail to result in a measurable (and thus significant) ecological effect on the ground, even when the critical load is far exceeded, depending on the size of the 'dose'.
- 3.2.24 Given this background, it is necessary to refer to dose-response relationships and the forecast background deposition rate by 2033 to determine the ecological effect of a given retardation in nitrogen deposition rate. Since there is a significant improvement in nitrogen deposition rates in the Do Something scenario, the relevant question is whether there would be an ecological difference between any improvement in the vegetation due to the Projected Baseline and that resulting from the Do Something scenario. In real terms, would one expect a meaningful ecological difference in vegetation characteristics between an improvement in the rate of nitrogen deposition of 1.71 kgN/ha/yr and one of 1.55 kgN/ha/yr (the nearest area of heathland at receptor 38, the A26 at Poundgate) or between an improvement of 1.96 kg N/ha/yr and one of 1.68 kgN/ha/yr (adjacent to receptor 37W, A275 at Wych Cross), or between an improvement of 1.93 kgN/ha/yr and one of 1.67 kgN/ha/yr (receptor 37E, A275 at Wych Cross).
- 3.2.25 Reference to Appendix 5 of Caporn et al (2016) suggests that at background deposition rates of c. 15kgN/ha/yr (the approximate deposition rate forecast at the closest areas of heathland in this modelling) the forecast net reduction in nitrogen deposition at the most affected areas of heathland (a little less than 2kgN/ha/yr) could potentially result in an increase in species richness (whether grass species richness, moss species richness or total species richness) of up to c. 3-4% of the maximum. Using a total maximum species richness of 37 species³³ this would mean approximately 1-2 more species could be found in the sward on average. Such a reduction in deposition rates could also result in a reduction in grass (graminoid) cover of up to 1%³⁴ if other factors that are likely to have a much greater effect on species richness and grass cover than nitrogen deposition (such as management and drainage) are suitable.

²⁸ Caporn et al (2016), page 39

²⁹ Compiled and analysed in Caporn et al 2016

³⁰ Ibid. paragraph 5 page ii

³¹ Ibid. Tables 20-22, pages 57-60 show that, for lowland heathland, as background deposition rates increase the effect of adding a given amount of extra nitrogen decreases for most parameters

³² Grasses often benefit at the expense of other species in habitats subject to elevated nitrogen deposition and as such their abundance increases rather than decreases; however, grass cover is also heavily influenced by other factors unrelated to nitrogen deposition

³³ 37 species is the maximum species richness in the lowland heathland sample reported in Caporn et al (2016) and is the reference species richness for lowland heathland used throughout that report.

³⁴ Appendix 5, Caporn et al (2016)

- 3.2.26 Appendix 5 of Caporn et al (2016) also suggests that at a background deposition rate of 15 kgN/ha/yr the worst-case additional nitrogen deposition to heathland as a result of traffic growth (c. 0.3 kgN/ha/yr at the A275) could, if it constituted a net increase in deposition, result in a 0.1% increase in grass (graminoid) cover and a 0.6% reduction in species richness (whether grasses, mosses or total species richness) at the roadside (the change away from the roadside would be much less). However, expressing the change in species richness as a percentage takes no account of the fact that one cannot have a fraction of a species (for example, 0.6% of 37 species would be a reduction of 0.2 species, which is not possible). This interpretive problem is addressed by expressing the same data in relation to the nitrogen dose that would reduce species richness by at least 1 species. In practice this therefore defines the minimum nitrogen dose that would be expected to result in a change in the number of species recorded. Table 21 of Caporn et al (2016) shows that, based on the heathlands surveyed, at a background nitrogen deposition rate of c. 15 kgN/ha/yr species richness in lowland heathland would not be expected to change until a dose of c. 1.3 kgN/ha/yr.
- 3.2.27 In terms of changes in coarse habitat structure it is considered that the small forecast additional nitrogen deposition (equivalent to a maximum c. 2% of the deposition rate otherwise forecast in these locations by 2033) would not stimulate growth to such an extent that a material change in management burden occurred, and the structure of the sward is dictated primarily by management.
- 3.2.28 Bearing in mind that a net reduction in nitrogen deposition is actually being forecast, the most that might be expected by 2033 due to traffic growth on roads through the SAC is that one *might* record a reduction in percentage grass cover immediately adjacent to the A275 of 0.9%, as opposed to a potential 1% reduction in the hypothetical case of no traffic growth. Whether any difference would actually be observed in practice would depend heavily on other factors, because management regime in particular has a much greater influence than nitrogen deposition on parameters such as percentage grass cover and species richness. The total species richness (or number of moss species or grass species) would not be expected to be any different in practice than would be the case without any traffic growth.
- 3.2.29 This conclusion can be stated with a high degree of confidence for a number of reasons. First, AECOM has carried out sensitivity testing of nitrogen deposition rates using different deposition velocities. The AECOM model uses a nitrogen deposition velocity for heathland ('short vegetation') of 0.1 cms⁻¹. That accords with the DMRB guidance and is also very close to that used in Environment Agency guidance (which uses a figure of 0.15 cms⁻¹). However, the trends described above would still arise with much higher deposition velocities³⁵.
- 3.2.30 Secondly, the results hold true even if actual measured deposition rates are substantially higher than those extrapolated from Defra mapping, as is suggested by measured data provided by Wealden District Council³⁶. For example, at background deposition rates of 30 kgN/ha/yr, an additional 2.4 kgN/ha/yr would be required to reduce the average species richness of the sward.³⁷
- 3.2.31 Thirdly, the conclusions are supported by solid academic research. Southon et al (2013) studied over fifty heathlands across England at deposition rates of up to 32.4kgN/ha/yr and found that above 20 kgN/ha/yr '*... declines in species richness plateaued, indicating a reduction in sensitivity as N loading increased*'. The heathland sites covered by the research reported in Caporn et al (2016) had a wide geographic spread and were subject to a range of different 'conditions' but the identified trends were nonetheless observable. The fact that a given heathland site may not have been included in the sample cannot be a basis for the identified trend to be dismissed as inapplicable. On the contrary, the value of the available dose-response research is precisely in the fact that it covers a geographic range of sites subject to a mixture of different influences that might otherwise mask the nitrogen relationships if a given site was looked at in isolation. Caporn et al (2016) illustrates that consistent trends have been identified *despite* the differing geographic locations of those habitats and different conditions at the sites involved.
- 3.2.32 Heathland and acid grassland (a related habitat that is often found intermixed with heathland) have been particularly well studied across broad geographical, climatic and pollution gradients

³⁵ AECOM has undertaken sensitivity testing using deposition velocities of 0.24 cms⁻¹ and 0.34 cms⁻¹ to heathland (Environment Agency and DMRB guidance reserves such high deposition velocities for woodland). This still results in a large forecast net improvement in nitrogen deposition.

³⁶ AQC report- Ashdown Forest SAC, Air Quality Monitoring and Modelling, December 2017 update with some redacted locations reinstated

³⁷ Table 21 of Caporn et al 2016

covering different levels of soil organic matter, rates of nutrient cycling, plant species assemblages and management regimes. Despite this, the overall trends, including that a given 'dose' of nitrogen generally has less effect on a range of vegetation parameters (other than grass cover) as background deposition rates rise has been reported by various peer reviewed academic papers³⁸. Southon et al (2013) surveyed 52 heathlands across England and observed statistically significant trends despite the large differences in conditions of these heathlands. That paper specifically states that '*the biggest reductions in species number [were] associated with increasing N inputs at the low end of the deposition range*' and that '*The similarity of relationships between upland and lowland environments, across broad spatial and climatic gradients, highlights the ubiquity of relationships with N*'. Based on the consistent trend across the range of habitats studied (including wet habitats such as bogs as well as lowland heathland, upland heathland and dune systems) there is no basis to assume that the identified trends would not be applicable to all types of heath, including wet heath. Upland heathlands tend to be wetter than lowland heathlands due to climate differences and yet the same pattern has been observed as reported in Southon et al (2013).

- 3.2.33 Due to the existence of other influences (such as management) that have a much greater effect on relevant vegetation parameters than does nitrogen deposition, there can be no absolute certainty that the reported trends would be observed in a given part of Ashdown Forest. However, there is a reasonable scientific expectation that the observed relationships would be detected if Ashdown Forest was included in the broader sample.
- 3.2.34 Fourthly, although it is necessary to carry out an 'in-combination' assessment of effects, it remains relevant to consider the extent to which Tunbridge Wells contributes to that in-combination effect. On that assessment, Tunbridge Wells' contribution is negligible at the closest areas of heathland to all modelled links.
- 3.2.35 Finally, in discussions over the emerging Statement of Common Ground, Natural England advised that the impact assessment should only include those areas which are currently heathland rather than speculate about parts of the SAC that constitute other habitats (particularly woodland) and may or may not be put down to heathland at an unspecified point in the future. As set out above, in relation to the A26 at Poundgate, there is no significant presence of heathland within 40m of the roadside so the relevant comparison is an improvement in the rate of nitrogen deposition in the Projected Baseline of 1.71 kgN/ha/yr and an improvement in the Do Something Scenario of 1.55 kgN/ha/yr (rather than 2.73 kgN/ha/yr and 1.75 kgN/ha/yr). A retardation of improvement of 0.16 kgN/ha/yr is clearly not of any ecological significance. Nonetheless, as a final precautionary step and for completeness, those areas were included in the modelling presented in Appendix A on the hypothetical (and unrealistic) assumption that heathland might be created at the roadside at some stage in the future. This enables consideration of whether, in the event that proposals emerged during the period to 2033 to establish heathland at the most affected part of the modelled network, the deposition rates forecast would hinder that process. The most affected part of the network according to this modelling is the location where forecast additional nitrogen deposition due to traffic growth is greatest, irrespective of the habitat actually present, and is an area of woodland immediately adjacent to the A26.
- 3.2.36 In the event that plans emerged to establish heathland in the area immediately adjacent to the A26 this location would still experience a net reduction in nitrogen deposition rate of c. 1.75 kgN/ha/yr by 2033 compared to the baseline situation. Due to traffic growth over the period to 2033, this reduction in deposition rate would be c. 0.98 kgN/ha/yr less than might otherwise be the case. Reference to Appendix 5 of Caporn et al (2016) suggests that the contribution of all growth at the closest point to the A26 *may* be sufficient to reduce heathland species richness by 2% compared to what would otherwise occur at that location in the absence of traffic growth, but according to Table 21 of Caporn et al (2016) this is still less than the amount required to result in an actual reduction in the number of species recorded in a quadrat at the forecast background

³⁸ Stevens, C. J.; Dise, N. B.; Gowing, D. J. G. and Mountford, J. O. (2006). Loss of forb diversity in relation to nitrogen deposition in the UK: regional trends and potential controls. *Global Change Biology*, 12(10), pp. 1823–1833.

Southon GE, Field C, Caporn SJM, Britton AJ, Power SA (2013) Nitrogen Deposition Reduces Plant Diversity and Alters Ecosystem Functioning: Field-Scale Evidence from a Nationwide Survey of UK Heathlands. *PLoS ONE* 8(4): e59031. doi:10.1371/journal.pone.0059031

Stevens, Carly; Dupre, Cecilia; Dorland, Edu; Gaudnik, Cassandre; Gowing, David J. G.; Bleeker, Albert; Diekmann, Martin; Alard, Didier; Bobbink, Roland; Fowler, David; Corcket, Emmanuel; Mountford, J. Owen; Vandvik, Vigdis; Aarrestad, Per Arild; Muller, Serge and Dise, Nancy B. (2010). Nitrogen deposition threatens species richness of grasslands across Europe. *Environmental Pollution*, 158(9), pp. 2940–2945.

rate of 17 kgN/ha/yr³⁹. The contribution of Tunbridge Wells Local Plan to additional nitrogen at the closest part of the SAC to the A26 is forecast to be 0.17 kgN/ha/yr⁴⁰. However, the forecast deposition rate of c. 16-17 kgN/ha/yr (with or without future traffic growth) would not prevent heathland being established if there was ever a desire to do so. The ability to create heathland adjacent to the A26 is likely to be influenced much more by other factors such as management, soil pH, soil phosphate levels, drainage and the removal of tree trunks and root systems⁴¹.

³⁹ Using the relationships identified in NECR2010 species richness would need to be 50 species for a reduction in species-richness of 2% to equate to a reduction of 1 species.

⁴⁰ 50% of the modelled difference between Do Something and Do Nothing for this link in Appendix A

⁴¹ The process of creating, and then resurfacing/maintaining a significant road and buried roadside services (where these are present) or drainage, often results in changes to the underlying geology and hydrological function of the soils at the roadside, including from the importation of atypical fill material during historic road construction. These habitats can be further affected by surface water runoff all year round (depending on local topography) and salt spray from winter gritting. In addition, it is often desirable to retain a belt of permanent forestry adjacent to roads in order to serve as a buffer feature to the heathland and (for the SPA) the disturbance-sensitive bird populations that lie behind it. The area adjacent to the road is the area most affected by nitrogen deposition due to local traffic.

4 Conclusion

- 4.1.1 The development of nitrogen dose-response relationships for various habitats clarifies the rate of additional nitrogen deposition required to achieve a measurable effect on heathland vegetation. It is therefore possible to use these relationships to determine that a plan or collection of plans will not have an adverse effect. Such a plan would be one in which one could say with confidence that a) there would not be a significant difference in the vegetation whether or not that plan proceeded and b) there would not be a significant effect on the vegetation (and thus protection conveyed to the European site) whether or not the contribution of that plan was 'mitigated' (i.e. reduced to such an extent that it did not appear in the model at all). It would clearly be unreasonable to claim that such a plan caused an adverse effect 'in combination' or that it should be mitigated. The contribution of the Tunbridge Wells Local Plan falls within those parameters.
- 4.1.2 Since a) air quality in 2033 is forecast to be significantly better than in 2017 notwithstanding the precautionary assumptions made about both growth and improvements in vehicle emissions factors, b) no significant in combination retardation of vegetation improvement at the closest and most affected areas of heathland is expected and c) the contribution of Tunbridge Wells Local Plan to the 'in combination' scenario for those nearest areas of heathland is negligible, the modelling in Appendix A does not provide any basis to conclude an adverse effect on integrity of Ashdown Forest SAC or SPA from growth in Tunbridge Wells Borough over that period in combination with other plans. Since no net adverse effect on integrity is forecast, no mitigation as such would be required.
- 4.1.3 It should be noted that the assessment undertaken to inform this conclusion was precautionary. For example:
- The Design Manual for Roads and Bridges and Defra guidance recommend making a 2% reduction per annum in background emissions/deposition rates throughout the period from base year to assessment year in order to allow for improvements such as the introduction of Euro6 standard vehicles. AECOM took a considerably more cautious approach in this modelling which could therefore prove to underestimate improvements in background nitrogen deposition.
 - Rather than simply model the rates of growth set out in adopted or submitted Core Strategies and Local Plans, the AECOM model increased the housing delivery rates for those authorities immediately surrounding Ashdown Forest SAC (Wealden District, Mid-Sussex District and Tandridge District) to allow for additional growth in line with the most-recently expressed Objectively Assessed Need as of June 2017. In some cases (e.g. Mid-Sussex) this substantially increased the amount of housing allowed for over the period to 2033. In practice, therefore, growth around Ashdown Forest SAC may have been over-estimated. For example, the recent Government consultation on Objectively Assessed Need (OAN) proposes a significantly lower OAN for Wealden District than was allowed for in the AECOM model.
- 4.1.4 It is therefore concluded that no adverse effect upon the integrity of Ashdown Forest SAC is expected to result from development provided by the Tunbridge Wells Local Plan, even in combination with other plans and projects. This is due to a combination of a) an expected net improvement in air quality over the Local Plan period, b) the fact that, whether or not that improvement occurs to the extent forecast, the contribution of the Tunbridge Wells Local Plan to changes in roadside air quality is demonstrably ecologically negligible due to the very small magnitude and c) the precautionary nature of the modelling.
- 4.1.5 This conclusion is not intended to suggest that no active attempt should be made to reduce background NO_x concentrations and nitrogen deposition around Ashdown Forest as a matter of general good stewardship if that is what the authorities agree, and the authorities already have a forum for collaborative involvement in this issue via the working group that has recently been convened by South Downs National Park Authority. The aforementioned forum will also be important in monitoring long-term trends in roadside air quality within Ashdown Forest SAC at regular (e.g. five-year) intervals, in order to track the forecast improvements and, if necessary, trigger updates to the modelling and its conclusions during the plan period. The first practical outcome of this forum is a multi-authority agreement to prepare a Statement of Common Ground

(SoCG) relating to nitrogen impacts on Ashdown Forest. The SoCG will include actions such as a Site Nitrogen Action Plan (SNAP) for the SAC/SPA to address sources of background nitrogen such as agriculture and existing traffic. This forum will provide a further safeguard to ensure that changes in traffic flows and vehicular emissions stemming from development do not result in adverse effects upon the integrity of Ashdown Forest SAC in isolation or in combination.

Appendix A. Detailed Modelling Results

Ammonia Concentrations

Receptor 38: the A26 at Poundgate

Lookup		Distance From Road (m)	Annual Mean NH ₃ Conc. (ug/m3)			Change	
ID	Road Link		BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
1	38_0m	0	2.32	2.47	2.58	0.11	0.26
2	38_5m	5	1.61	1.69	1.75	0.06	0.15
3	38_10m	10	1.31	1.36	1.41	0.05	0.10
4	38_15m	15	1.15	1.19	1.23	0.04	0.08
5	38_20m	20	1.05	1.08	1.11	0.03	0.06
6	38_30m	30	0.93	0.95	0.97	0.02	0.05
7	38_40m	40	0.86	0.88	0.89	0.02	0.04
8	38_50m	50	0.81	0.83	0.84	0.01	0.03
9	38_60m	60	0.78	0.79	0.81	0.01	0.03
10	38_70m	70	0.76	0.77	0.78	0.01	0.02
11	38_80m	80	0.74	0.75	0.76	0.01	0.02
12	38_90m	90	0.72	0.73	0.74	0.01	0.02
13	38_100m	100	0.71	0.72	0.73	0.01	0.02
14	38_125m	125	0.69	0.69	0.70	0.01	0.01
15	38_150m	150	0.67	0.68	0.68	0.00	0.01
16	38_175m	175	0.66	0.67	0.67	0.00	0.01
17	38_200m	200	0.65	0.66	0.66	0.00	0.01

Receptor 37W – A275 at Wych Cross

Lookup		Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
ID	Road Link		BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
18	37W_0m	0	1.07	1.11	1.14	0.03	0.07
19	37W_5m	5	0.86	0.88	0.89	0.02	0.04
20	37W_10m	10	0.78	0.79	0.80	0.01	0.03
21	37W_15m	15	0.74	0.75	0.76	0.01	0.02
22	37W_20m	20	0.71	0.72	0.73	0.01	0.02
23	37W_30m	30	0.68	0.69	0.70	0.01	0.01
24	37W_40m	40	0.67	0.67	0.68	0.00	0.01
25	37W_50m	50	0.66	0.66	0.66	0.00	0.01
26	37W_60m	60	0.65	0.65	0.66	0.00	0.01
27	37W_70m	70	0.64	0.65	0.65	0.00	0.01
28	37W_80m	80	0.64	0.64	0.64	0.00	0.01
29	37W_90m	90	0.64	0.64	0.64	0.00	0.00
30	37W_100m	100	0.63	0.64	0.64	0.00	0.00
31	37W_125m	125	0.63	0.63	0.63	0.00	0.00
32	37W_150m	150	0.62	0.63	0.63	0.00	0.00
33	37W_175m	175	0.62	0.62	0.62	0.00	0.00

34		37W_200m	200	0.62	0.62	0.62	0.00	0.00
Receptor 37E – A275 at Wych Cross								
			Annual Mean Nox Conc. (ug/m3)			Change		
Lookup		Distance	BL	DN	DS			
ID	Road Link	From Road (m)	Base	(Base 2033)	(Scn1 2033)	(DS-DN)		(DS-BL)
35	37E_0m	0	1.03	1.06	1.09	0.03		0.06
36	37E_5m	5	0.84	0.86	0.87	0.02		0.03
37	37E_10m	10	0.77	0.78	0.79	0.01		0.02
38	37E_15m	15	0.73	0.74	0.75	0.01		0.02
39	37E_20m	20	0.71	0.72	0.72	0.01		0.02
40	37E_30m	30	0.68	0.69	0.69	0.00		0.01
41	37E_40m	40	0.66	0.67	0.67	0.00		0.01
42	37E_50m	50	0.65	0.66	0.66	0.00		0.01
43	37E_60m	60	0.65	0.65	0.65	0.00		0.01
44	37E_70m	70	0.64	0.65	0.65	0.00		0.01
45	37E_80m	80	0.64	0.64	0.64	0.00		0.01
46	37E_90m	90	0.64	0.64	0.64	0.00		0.00
47	37E_100m	100	0.63	0.64	0.64	0.00		0.00
48	37E_125m	125	0.63	0.63	0.63	0.00		0.00
49	37E_150m	150	0.63	0.63	0.63	0.00		0.00
50	37E_175m	175	0.62	0.62	0.63	0.00		0.00
51	37E_200m	200	0.62	0.62	0.62	0.00		0.00

Receptor 34 – A22 at Nutley								
			Annual Mean Nox Conc. (ug/m3)			Change		
Lookup		Distance	BL	DN	DS			
ID	Road Link	From Road (m)	Base	(Base 2033)	(Scn1 2033)	(DS-DN)		(DS-BL)
52	34_0m	0	1.70	1.79	1.80	0.01		0.11
53	34_5m	5	1.26	1.31	1.32	0.01		0.06
54	34_10m	10	1.06	1.10	1.11	0.01		0.04
55	34_15m	15	0.96	0.99	0.99	0.00		0.03
56	34_20m	20	0.89	0.91	0.92	0.00		0.03
57	34_30m	30	0.81	0.83	0.83	0.00		0.02
58	34_40m	40	0.77	0.78	0.78	0.00		0.02
59	34_50m	50	0.74	0.75	0.75	0.00		0.01
60	34_60m	60	0.72	0.73	0.73	0.00		0.01
61	34_70m	70	0.70	0.71	0.71	0.00		0.01
62	34_80m	80	0.69	0.70	0.70	0.00		0.01
63	34_90m	90	0.68	0.69	0.69	0.00		0.01
64	34_100m	100	0.67	0.68	0.68	0.00		0.01
65	34_125m	125	0.66	0.66	0.66	0.00		0.01
66	34_150m	150	0.65	0.65	0.65	0.00		0.00
67	34_175m	175	0.64	0.64	0.65	0.00		0.00
68	34_200m	200	0.64	0.64	0.64	0.00		0.00

Receptor 33 – A22 at Wych Cross								
			Annual Mean Nox Conc. (ug/m3)			Change		
Lookup		Distance	BL	DN	DS			
ID	Road Link	From Road (m)	Base	(Base 2033)	(Scn1 2033)	(DS-DN)		(DS-BL)
69	33_0m	0	1.36	1.42	1.43	0.01		0.07

70	33_5m	5	1.05	1.08	1.09	0.01	0.04
71	33_10m	10	0.92	0.94	0.94	0.00	0.03
72	33_15m	15	0.85	0.86	0.87	0.00	0.02
73	33_20m	20	0.80	0.82	0.82	0.00	0.02
74	33_30m	30	0.75	0.76	0.76	0.00	0.01
75	33_40m	40	0.72	0.73	0.73	0.00	0.01
76	33_50m	50	0.70	0.71	0.71	0.00	0.01
77	33_60m	60	0.69	0.69	0.69	0.00	0.01
78	33_70m	70	0.68	0.68	0.68	0.00	0.01
79	33_80m	80	0.67	0.67	0.67	0.00	0.01
80	33_90m	90	0.66	0.66	0.67	0.00	0.01
81	33_100m	100	0.66	0.66	0.66	0.00	0.00
82	33_125m	125	0.65	0.65	0.65	0.00	0.00
83	33_150m	150	0.64	0.64	0.64	0.00	0.00
84	33_175m	175	0.63	0.64	0.64	0.00	0.00
85	33_200m	200	0.63	0.63	0.63	0.00	0.00

Receptor 6b_37_33 – Junction of A22 and A275

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
			BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
86	6b_37_33_0m	0	1.42	1.48	1.51	0.03	0.09
87	6b_37_33_5m	5	1.26	1.31	1.33	0.02	0.07
88	6b_37_33_10m	10	1.18	1.22	1.24	0.02	0.06
89	6b_37_33_15m	15	1.12	1.16	1.17	0.02	0.05
90	6b_37_33_20m	20	1.07	1.11	1.12	0.01	0.05
91	6b_37_33_30m	30	1.00	1.03	1.05	0.01	0.04
92	6b_37_33_40m	40	0.95	0.98	0.99	0.01	0.04
93	6b_37_33_50m	50	0.91	0.93	0.94	0.01	0.03
94	6b_37_33_60m	60	0.87	0.89	0.90	0.01	0.03
95	6b_37_33_70m	70	0.85	0.86	0.87	0.01	0.03
96	6b_37_33_80m	80	0.82	0.84	0.85	0.01	0.02
97	6b_37_33_90m	90	0.80	0.82	0.82	0.01	0.02
98	6b_37_33_100m	100	0.79	0.80	0.81	0.01	0.02
99	6b_37_33_125m	125	0.75	0.77	0.77	0.00	0.02
100	6b_37_33_150m	150	0.73	0.74	0.74	0.00	0.01
101	6b_37_33_175m	175	0.71	0.72	0.72	0.00	0.01
102	6b_37_33_200m	200	0.70	0.70	0.71	0.00	0.01

Receptor 6b - A22 at Royal Ashdown Forest Golf Course

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
			BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
103	6b_3m	3	1.19	1.23	1.25	0.01	0.06
104	6b_8m	8	0.99	1.02	1.03	0.01	0.04
105	6b_13m	13	0.89	0.91	0.92	0.01	0.03
106	6b_18m	18	0.83	0.85	0.86	0.01	0.02
107	6b_23m	23	0.80	0.81	0.81	0.00	0.02
108	6b_33m	33	0.75	0.76	0.76	0.00	0.01
109	6b_43m	43	0.72	0.73	0.73	0.00	0.01

110	6b_53m	53	0.70	0.71	0.71	0.00	0.01
111	6b_63m	63	0.69	0.69	0.69	0.00	0.01
112	6b_73m	73	0.68	0.68	0.68	0.00	0.01
113	6b_83m	83	0.67	0.67	0.67	0.00	0.01
114	6b_93m	93	0.66	0.66	0.67	0.00	0.01
115	6b_103m	103	0.66	0.66	0.66	0.00	0.01
116	6b_128m	128	0.65	0.65	0.65	0.00	0.00
117	6b_153m	153	0.64	0.64	0.64	0.00	0.00
118	6b_178m	178	0.63	0.64	0.64	0.00	0.00
119	6b_203m	203	0.63	0.63	0.63	0.00	0.00

Receptor 6aSW – A22 at Royal Ashdown Forest Golf Course

Lookup		Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
ID	Road Link		BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
120	6aSW_0m	0	1.56	1.64	1.67	0.02	0.10
121	6aSW_5m	5	1.12	1.16	1.17	0.01	0.05
122	6aSW_10m	10	0.96	0.98	0.99	0.01	0.04
123	6aSW_15m	15	0.87	0.89	0.90	0.01	0.03
124	6aSW_20m	20	0.82	0.83	0.84	0.01	0.02
125	6aSW_30m	30	0.76	0.77	0.77	0.00	0.02
126	6aSW_40m	40	0.72	0.73	0.73	0.00	0.01
127	6aSW_50m	50	0.70	0.71	0.71	0.00	0.01
128	6aSW_60m	60	0.68	0.69	0.69	0.00	0.01
129	6aSW_70m	70	0.67	0.68	0.68	0.00	0.01
130	6aSW_80m	80	0.66	0.67	0.67	0.00	0.01
131	6aSW_90m	90	0.66	0.66	0.66	0.00	0.01
132	6aSW_100m	100	0.65	0.66	0.66	0.00	0.01
133	6aSW_125m	125	0.64	0.64	0.65	0.00	0.00
134	6aSW_150m	150	0.63	0.64	0.64	0.00	0.00
135	6aSW_175m	175	0.63	0.63	0.63	0.00	0.00
136	6aSW_200m	200	0.63	0.63	0.63	0.00	0.00

Receptor 6aSE – A22 at Royal Ashdown Forest Golf Course

Lookup		Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
ID	Road Link		BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
137	6aSE_0m	0	1.79	1.89	1.92	0.03	0.13
138	6aSE_5m	5	1.26	1.31	1.32	0.02	0.07
139	6aSE_10m	10	1.06	1.09	1.10	0.01	0.05
140	6aSE_15m	15	0.95	0.98	0.99	0.01	0.04
141	6aSE_20m	20	0.89	0.91	0.92	0.01	0.03
142	6aSE_30m	30	0.81	0.83	0.84	0.01	0.02
143	6aSE_40m	40	0.77	0.79	0.79	0.00	0.02
144	6aSE_50m	50	0.75	0.76	0.76	0.00	0.01
145	6aSE_60m	60	0.73	0.74	0.74	0.00	0.01
146	6aSE_70m	70	0.71	0.72	0.72	0.00	0.01
147	6aSE_80m	80	0.70	0.71	0.71	0.00	0.01
148	6aSE_90m	90	0.70	0.70	0.70	0.00	0.01
149	6aSE_100m	100	0.69	0.70	0.70	0.00	0.01
150	6aSE_125m	125	0.68	0.68	0.68	0.00	0.01

151	6aSE_150m	150	0.67	0.67	0.68	0.00	0.01
152	6aSE_175m	175	0.66	0.67	0.67	0.00	0.01
153	6aSE_200m	200	0.66	0.66	0.66	0.00	0.01

Receptor 6aNE – A22 at Royal Ashdown Forest Golf Course

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
			BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
154	6aNE_0m	0	1.53	1.61	1.63	0.02	0.10
155	6aNE_5m	5	1.14	1.18	1.20	0.01	0.06
156	6aNE_10m	10	0.98	1.01	1.02	0.01	0.04
157	6aNE_15m	15	0.90	0.92	0.93	0.01	0.03
158	6aNE_20m	20	0.85	0.86	0.87	0.01	0.02
159	6aNE_30m	30	0.78	0.80	0.80	0.00	0.02
160	6aNE_40m	40	0.74	0.76	0.76	0.00	0.01
161	6aNE_50m	50	0.72	0.73	0.73	0.00	0.01
162	6aNE_60m	60	0.70	0.71	0.71	0.00	0.01
163	6aNE_70m	70	0.69	0.70	0.70	0.00	0.01
164	6aNE_80m	80	0.68	0.69	0.69	0.00	0.01
165	6aNE_90m	90	0.67	0.68	0.68	0.00	0.01
166	6aNE_100m	100	0.66	0.67	0.67	0.00	0.01
167	6aNE_125m	125	0.65	0.66	0.66	0.00	0.01
168	6aNE_150m	150	0.64	0.65	0.65	0.00	0.00
169	6aNE_175m	175	0.64	0.64	0.64	0.00	0.00
170	6aNE_200m	200	0.63	0.64	0.64	0.00	0.00

Receptor 33N – A22 at Wych Cross

Lookup ID	Road Link	Distance From Road (m)	Annual Mean Nox Conc. (ug/m3)			Change	
			BL Base	DN (Base 2033)	DS (Scn1 2033)	(DS-DN)	(DS-BL)
171	33N_0m	0	1.32	1.38	1.39	0.01	0.07
172	33N_5m	5	1.02	1.05	1.05	0.01	0.04
173	33N_10m	10	0.89	0.92	0.92	0.00	0.03
174	33N_15m	15	0.83	0.84	0.85	0.00	0.02
175	33N_20m	20	0.79	0.80	0.80	0.00	0.02
176	33N_30m	30	0.74	0.75	0.75	0.00	0.01
177	33N_40m	40	0.71	0.72	0.72	0.00	0.01
178	33N_50m	50	0.69	0.70	0.70	0.00	0.01
179	33N_60m	60	0.68	0.68	0.68	0.00	0.01
180	33N_70m	70	0.67	0.67	0.67	0.00	0.01
181	33N_80m	80	0.66	0.66	0.67	0.00	0.01
182	33N_90m	90	0.65	0.66	0.66	0.00	0.00
183	33N_100m	100	0.65	0.65	0.65	0.00	0.00
184	33N_125m	125	0.64	0.64	0.64	0.00	0.00
185	33N_150m	150	0.63	0.64	0.64	0.00	0.00
186	33N_175m	175	0.63	0.63	0.63	0.00	0.00
187	33N_200m	200	0.63	0.63	0.63	0.00	0.00

NOx, Nitrogen Deposition and Acid Deposition

Receptor 38: the A26 at Poundgate

Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	73.83	46.59	51.01	53.74	2.73	7.15	-20.09	19.50	16.77	17.41	17.75	0.34	0.98	-1.75	1.59	1.49	1.53	1.56	0.02	0.07	-0.03
5	47.07	30.26	32.96	34.44	1.47	4.17	-12.64	16.88	14.58	14.97	15.17	0.20	0.59	-1.70	1.40	1.33	1.36	1.37	0.01	0.04	-0.03
10	35.91	23.49	25.37	26.44	1.06	2.95	-9.47	15.73	13.65	13.93	14.08	0.15	0.42	-1.66	1.32	1.27	1.29	1.30	0.01	0.03	-0.02
15	29.98	19.91	21.39	22.21	0.82	2.30	-7.78	15.12	13.16	13.38	13.49	0.11	0.33	-1.63	1.27	1.23	1.25	1.25	0.01	0.02	-0.02
20	26.19	17.63	18.82	19.50	0.68	1.88	-6.69	14.72	12.84	13.02	13.12	0.09	0.27	-1.60	1.25	1.21	1.22	1.23	0.01	0.02	-0.02
30	21.66	14.92	15.79	16.28	0.49	1.36	-5.38	14.24	12.47	12.60	12.67	0.07	0.20	-1.57	1.21	1.18	1.19	1.20	0.00	0.01	-0.02
40	19.09	13.38	14.07	14.45	0.38	1.08	-4.64	13.96	12.25	12.35	12.41	0.05	0.16	-1.55	1.19	1.17	1.17	1.18	0.00	0.01	-0.02
50	17.37	12.36	12.92	13.25	0.33	0.90	-4.12	13.78	12.11	12.19	12.24	0.05	0.13	-1.54	1.18	1.16	1.16	1.16	0.00	0.01	-0.01
60	16.17	11.63	12.10	12.38	0.27	0.75	-3.79	13.65	12.01	12.08	12.12	0.04	0.11	-1.53	1.17	1.15	1.15	1.16	0.00	0.01	-0.01
70	15.27	11.10	11.50	11.75	0.25	0.65	-3.52	13.55	11.93	11.99	12.03	0.03	0.10	-1.52	1.16	1.14	1.15	1.15	0.00	0.01	-0.01
80	14.56	10.68	11.04	11.26	0.22	0.58	-3.30	13.47	11.87	11.93	11.96	0.03	0.09	-1.52	1.16	1.14	1.14	1.14	0.00	0.01	-0.01
90	14.01	10.34	10.68	10.85	0.16	0.50	-3.17	13.41	11.83	11.88	11.90	0.03	0.08	-1.51	1.15	1.14	1.14	1.14	0.00	0.01	-0.01
100	13.55	10.07	10.36	10.52	0.16	0.45	-3.03	13.37	11.79	11.83	11.85	0.02	0.07	-1.51	1.15	1.13	1.14	1.14	0.00	0.00	-0.01
125	12.70	9.56	9.80	9.93	0.13	0.36	-2.77	13.27	11.72	11.75	11.77	0.02	0.05	-1.50	1.14	1.13	1.13	1.13	0.00	0.00	-0.01
150	12.11	9.21	9.41	9.51	0.11	0.30	-2.59	13.21	11.67	11.70	11.71	0.01	0.04	-1.50	1.14	1.12	1.13	1.13	0.00	0.00	-0.01
175	11.67	8.96	9.12	9.21	0.09	0.25	-2.47	13.16	11.63	11.65	11.67	0.01	0.04	-1.49	1.13	1.12	1.12	1.12	0.00	0.00	-0.01
200	11.35	8.76	8.90	8.98	0.08	0.22	-2.37	13.13	11.60	11.62	11.63	0.01	0.03	-1.49	1.13	1.12	1.12	1.12	0.00	0.00	-0.01

Receptor 37W – A275 at Wych Cross

Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	27.10	18.70	19.93	20.64	0.71	1.94	-6.46	15.69	13.73	13.91	14.01	0.10	0.28	-1.68	1.32	1.29	1.30	1.31	0.01	0.02	-0.02
5	19.43	13.96	14.63	15.02	0.38	1.06	-4.41	14.86	13.06	13.16	13.22	0.06	0.16	-1.64	1.26	1.24	1.25	1.25	0.00	0.01	-0.01
10	16.64	12.24	12.72	12.97	0.25	0.73	-3.67	14.55	12.82	12.89	12.93	0.04	0.11	-1.62	1.24	1.22	1.23	1.23	0.00	0.01	-0.01
15	15.17	11.34	11.71	11.90	0.19	0.56	-3.27	14.39	12.69	12.74	12.77	0.03	0.08	-1.61	1.23	1.21	1.22	1.22	0.00	0.01	-0.01
20	14.27	10.79	11.08	11.25	0.16	0.46	-3.02	14.29	12.61	12.65	12.68	0.02	0.07	-1.61	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
30	13.23	10.14	10.37	10.48	0.12	0.34	-2.75	14.17	12.52	12.55	12.57	0.02	0.05	-1.60	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
40	12.62	9.78	9.95	10.05	0.10	0.27	-2.57	14.10	12.47	12.49	12.51	0.01	0.04	-1.60	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
50	12.24	9.54	9.69	9.77	0.08	0.22	-2.47	14.06	12.43	12.46	12.47	0.01	0.03	-1.60	1.21	1.19	1.20	1.20	0.00	0.00	-0.01
60	11.97	9.38	9.51	9.57	0.07	0.20	-2.40	14.03	12.41	12.43	12.44	0.01	0.03	-1.59	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
70	11.78	9.26	9.37	9.43	0.06	0.17	-2.34	14.01	12.39	12.41	12.42	0.01	0.03	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
80	11.62	9.16	9.27	9.32	0.05	0.15	-2.30	13.99	12.38	12.39	12.40	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
90	11.50	9.09	9.18	9.23	0.05	0.14	-2.27	13.98	12.37	12.38	12.39	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
100	11.40	9.03	9.12	9.16	0.04	0.13	-2.24	13.97	12.36	12.37	12.38	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
125	11.22	8.92	8.99	9.03	0.03	0.11	-2.19	13.95	12.34	12.36	12.36	0.00	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
150	11.09	8.84	8.91	8.93	0.03	0.09	-2.16	13.93	12.33	12.34	12.35	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
175	11.00	8.78	8.84	8.87	0.02	0.08	-2.13	13.92	12.32	12.33	12.34	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	10.93	8.74	8.79	8.82	0.02	0.07	-2.11	13.92	12.32	12.33	12.33	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01

Receptor 37E – A275 at Wych Cross																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	25.65	17.80	18.92	19.57	0.66	1.77	-6.08	15.53	13.60	13.77	13.86	0.09	0.26	-1.67	1.31	1.28	1.29	1.30	0.01	0.02	-0.02
5	18.80	13.57	14.20	14.55	0.35	0.98	-4.25	14.79	13.00	13.10	13.15	0.05	0.15	-1.64	1.26	1.23	1.24	1.25	0.00	0.01	-0.01
10	16.23	12.00	12.45	12.70	0.25	0.70	-3.54	14.50	12.78	12.85	12.88	0.04	0.10	-1.62	1.24	1.22	1.22	1.23	0.00	0.01	-0.01
15	14.90	11.17	11.52	11.71	0.19	0.54	-3.18	14.36	12.66	12.72	12.74	0.03	0.08	-1.61	1.23	1.21	1.21	1.22	0.00	0.01	-0.01
20	14.05	10.66	10.95	11.11	0.17	0.45	-2.94	14.26	12.59	12.63	12.66	0.02	0.07	-1.61	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
30	13.09	10.06	10.27	10.39	0.11	0.32	-2.71	14.16	12.51	12.54	12.56	0.02	0.05	-1.60	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
40	12.53	9.72	9.89	9.98	0.09	0.26	-2.55	14.09	12.46	12.48	12.50	0.01	0.04	-1.60	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
50	12.18	9.51	9.65	9.73	0.07	0.22	-2.45	14.05	12.43	12.45	12.46	0.01	0.03	-1.59	1.21	1.19	1.20	1.20	0.00	0.00	-0.01
60	11.93	9.35	9.48	9.54	0.06	0.19	-2.39	14.03	12.41	12.42	12.43	0.01	0.03	-1.59	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
70	11.75	9.24	9.35	9.41	0.05	0.17	-2.34	14.01	12.39	12.41	12.41	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
80	11.60	9.15	9.26	9.30	0.05	0.15	-2.30	13.99	12.38	12.39	12.40	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
90	11.49	9.09	9.18	9.22	0.04	0.14	-2.27	13.98	12.37	12.38	12.39	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
100	11.40	9.03	9.12	9.16	0.04	0.13	-2.24	13.97	12.36	12.37	12.38	0.01	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
125	11.23	8.93	9.00	9.03	0.03	0.11	-2.20	13.95	12.35	12.36	12.36	0.00	0.02	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
150	11.12	8.86	8.93	8.95	0.03	0.09	-2.17	13.94	12.34	12.35	12.35	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
175	11.04	8.81	8.87	8.90	0.02	0.09	-2.15	13.93	12.33	12.34	12.34	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	10.98	8.77	8.83	8.85	0.02	0.08	-2.13	13.92	12.32	12.33	12.33	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
Receptor 34 – A22 at Nutley																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	52.42	32.83	35.67	36.22	0.55	3.39	-16.20	18.46	15.91	16.33	16.38	0.06	0.47	-2.08	1.52	1.44	1.47	1.48	0.00	0.03	-0.04
5	35.52	22.91	24.67	24.86	0.19	1.96	-10.65	16.76	14.55	14.81	14.84	0.03	0.29	-1.92	1.40	1.35	1.37	1.37	0.00	0.02	-0.03
10	27.98	18.50	19.76	19.89	0.14	1.39	-8.09	15.99	13.95	14.13	14.15	0.02	0.20	-1.84	1.35	1.30	1.32	1.32	0.00	0.01	-0.03
15	23.89	16.13	17.08	17.19	0.11	1.06	-6.70	15.56	13.61	13.76	13.77	0.02	0.16	-1.79	1.32	1.28	1.29	1.29	0.00	0.01	-0.02
20	21.32	14.62	15.39	15.50	0.11	0.88	-5.82	15.29	13.41	13.52	13.53	0.01	0.13	-1.76	1.30	1.27	1.27	1.27	0.00	0.01	-0.02
30	18.29	12.86	13.42	13.48	0.05	0.62	-4.81	14.97	13.16	13.24	13.25	0.01	0.09	-1.72	1.27	1.25	1.25	1.25	0.00	0.01	-0.02
40	16.54	11.85	12.30	12.36	0.05	0.51	-4.18	14.79	13.02	13.08	13.09	0.01	0.07	-1.70	1.26	1.24	1.24	1.24	0.00	0.01	-0.02
50	15.42	11.20	11.57	11.62	0.05	0.42	-3.80	14.67	12.93	12.98	12.99	0.01	0.06	-1.68	1.25	1.23	1.24	1.24	0.00	0.00	-0.02
60	14.63	10.73	11.05	11.08	0.03	0.35	-3.56	14.58	12.86	12.91	12.91	0.01	0.05	-1.67	1.25	1.23	1.23	1.23	0.00	0.00	-0.02
70	14.03	10.38	10.66	10.69	0.03	0.30	-3.35	14.52	12.81	12.85	12.86	0.00	0.05	-1.66	1.24	1.22	1.23	1.23	0.00	0.00	-0.01
80	13.57	10.12	10.36	10.39	0.03	0.27	-3.18	14.47	12.77	12.81	12.81	0.00	0.04	-1.66	1.24	1.22	1.22	1.22	0.00	0.00	-0.01
90	13.21	9.90	10.12	10.14	0.03	0.24	-3.07	14.43	12.74	12.78	12.78	0.00	0.04	-1.65	1.23	1.22	1.22	1.22	0.00	0.00	-0.01
100	12.91	9.73	9.93	9.95	0.02	0.22	-2.96	14.40	12.72	12.75	12.75	0.00	0.03	-1.65	1.23	1.22	1.22	1.22	0.00	0.00	-0.01
125	12.36	9.41	9.57	9.59	0.02	0.18	-2.77	14.34	12.67	12.70	12.70	0.00	0.03	-1.64	1.23	1.21	1.21	1.22	0.00	0.00	-0.01
150	11.98	9.19	9.32	9.33	0.01	0.14	-2.64	14.30	12.64	12.66	12.66	0.00	0.02	-1.64	1.23	1.21	1.21	1.21	0.00	0.00	-0.01
175	11.70	9.03	9.14	9.15	0.01	0.12	-2.55	14.27	12.62	12.64	12.64	0.00	0.02	-1.63	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
200	11.49	8.90	9.00	9.01	0.01	0.11	-2.48	14.25	12.60	12.62	12.62	0.00	0.02	-1.63	1.22	1.21	1.21	1.21	0.00	0.00	-0.01

Receptor 33 – A22 at Wych Cross																					
Annual Mean NOx (ug/m ³)								Annual Mean Total N Dep (kg N/ha/yr)								Annual Mean Total N Acid Dep (keq/ha/yr)					
Distance	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
From Road (m)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	39.24	25.44	27.50	27.75	0.25	2.30	-11.49	16.89	14.64	14.94	14.98	0.04	0.34	-1.91	1.41	1.35	1.37	1.38	0.00	0.02	-0.03
5	27.31	18.33	19.56	19.69	0.14	1.36	-7.61	15.65	13.66	13.84	13.86	0.02	0.20	-1.79	1.32	1.28	1.29	1.30	0.00	0.01	-0.03
10	22.37	15.39	16.25	16.34	0.08	0.95	-6.03	15.13	13.25	13.38	13.39	0.01	0.14	-1.73	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
15	19.75	13.82	14.51	14.56	0.05	0.74	-5.18	14.85	13.03	13.13	13.14	0.01	0.11	-1.70	1.26	1.24	1.24	1.24	0.00	0.01	-0.02
20	18.08	12.82	13.39	13.44	0.05	0.62	-4.64	14.67	12.90	12.98	12.98	0.01	0.09	-1.68	1.25	1.23	1.23	1.23	0.00	0.01	-0.02
30	16.09	11.64	12.05	12.10	0.05	0.46	-3.98	14.45	12.73	12.79	12.80	0.01	0.07	-1.66	1.24	1.22	1.22	1.22	0.00	0.00	-0.02
40	14.94	10.97	11.31	11.34	0.03	0.37	-3.60	14.33	12.64	12.69	12.69	0.00	0.05	-1.64	1.23	1.21	1.21	1.21	0.00	0.00	-0.02
50	14.20	10.52	10.80	10.83	0.03	0.31	-3.37	14.25	12.57	12.61	12.62	0.00	0.04	-1.63	1.22	1.20	1.21	1.21	0.00	0.00	-0.01
60	13.66	10.21	10.45	10.47	0.02	0.27	-3.18	14.19	12.53	12.57	12.57	0.00	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
70	13.28	9.97	10.18	10.21	0.02	0.24	-3.07	14.15	12.50	12.53	12.53	0.00	0.03	-1.62	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
80	12.96	9.79	9.98	10.00	0.02	0.21	-2.97	14.12	12.47	12.50	12.50	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
90	12.71	9.64	9.81	9.83	0.02	0.19	-2.88	14.09	12.45	12.48	12.48	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
100	12.51	9.52	9.67	9.69	0.02	0.18	-2.82	14.07	12.43	12.46	12.46	0.00	0.02	-1.61	1.21	1.19	1.20	1.20	0.00	0.00	-0.01
125	12.13	9.29	9.42	9.43	0.01	0.15	-2.69	14.03	12.40	12.42	12.42	0.00	0.02	-1.60	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
150	11.86	9.13	9.24	9.26	0.01	0.13	-2.61	14.00	12.38	12.40	12.40	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
175	11.67	9.02	9.11	9.13	0.01	0.11	-2.54	13.98	12.37	12.38	12.38	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	11.51	8.93	9.01	9.02	0.01	0.10	-2.49	13.96	12.35	12.37	12.37	0.00	0.01	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
Receptor 6b_37_33 – Junction of A22 and A275																					
Annual Mean NOx (ug/m ³)								Annual Mean Total N Dep (kg N/ha/yr)								Annual Mean Total N Acid Dep (keq/ha/yr)					
Distance	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
From Road (m)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	41.87	27.23	29.51	30.22	0.71	2.99	-11.65	17.13	14.83	15.16	15.25	0.09	0.42	-1.88	1.43	1.37	1.39	1.40	0.01	0.03	-0.03
5	35.43	23.41	25.23	25.74	0.52	2.34	-9.68	16.50	14.34	14.60	14.67	0.07	0.33	-1.83	1.38	1.33	1.35	1.35	0.00	0.02	-0.03
10	31.90	21.29	22.85	23.26	0.41	1.97	-8.64	16.15	14.06	14.29	14.35	0.06	0.29	-1.80	1.36	1.31	1.33	1.33	0.00	0.02	-0.03
15	29.64	19.93	21.32	21.68	0.35	1.75	-7.96	15.92	13.88	14.09	14.13	0.05	0.25	-1.79	1.34	1.30	1.31	1.32	0.00	0.02	-0.02
20	27.86	18.88	20.15	20.48	0.33	1.59	-7.39	15.74	13.74	13.93	13.97	0.04	0.23	-1.77	1.33	1.29	1.30	1.30	0.00	0.02	-0.02
30	25.22	17.30	18.37	18.65	0.27	1.35	-6.57	15.46	13.52	13.68	13.72	0.04	0.20	-1.74	1.31	1.27	1.28	1.29	0.00	0.01	-0.02
40	23.17	16.07	17.01	17.25	0.25	1.18	-5.91	15.24	13.35	13.49	13.52	0.03	0.17	-1.72	1.29	1.26	1.27	1.27	0.00	0.01	-0.02
50	21.56	15.11	15.92	16.14	0.22	1.03	-5.42	15.07	13.21	13.34	13.36	0.03	0.15	-1.70	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
60	20.30	14.36	15.07	15.26	0.19	0.91	-5.04	14.93	13.11	13.22	13.24	0.03	0.14	-1.69	1.27	1.24	1.25	1.25	0.00	0.01	-0.02
70	19.29	13.75	14.42	14.58	0.16	0.83	-4.71	14.83	13.02	13.12	13.15	0.02	0.12	-1.68	1.26	1.24	1.24	1.24	0.00	0.01	-0.02
80	18.44	13.25	13.84	14.01	0.16	0.76	-4.44	14.73	12.95	13.04	13.06	0.02	0.11	-1.67	1.26	1.23	1.24	1.24	0.00	0.01	-0.02
90	17.73	12.82	13.35	13.51	0.16	0.69	-4.22	14.66	12.89	12.97	13.00	0.02	0.10	-1.66	1.25	1.23	1.23	1.23	0.00	0.01	-0.02
100	17.13	12.46	12.97	13.10	0.14	0.64	-4.03	14.59	12.84	12.92	12.94	0.02	0.09	-1.66	1.25	1.22	1.23	1.23	0.00	0.01	-0.02
125	15.88	11.72	12.12	12.23	0.11	0.51	-3.65	14.46	12.74	12.80	12.82	0.02	0.08	-1.64	1.24	1.22	1.22	1.22	0.00	0.01	-0.01
150	14.98	11.17	11.52	11.60	0.08	0.44	-3.37	14.36	12.66	12.71	12.73	0.01	0.06	-1.63	1.23	1.21	1.21	1.21	0.00	0.00	-0.01
175	14.27	10.75	11.06	11.14	0.08	0.38	-3.13	14.28	12.60	12.65	12.66	0.01	0.06	-1.62	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
200	13.72	10.42	10.68	10.75	0.07	0.33	-2.97	14.22	12.56	12.59	12.60	0.01	0.05	-1.62	1.22	1.20	1.21	1.21	0.00	0.00	-0.01

Receptor 6b - A22 at Royal Ashdown Forest Golf Course																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
3	33.09	21.74	23.31	23.64	0.33	1.90	-9.44	16.21	14.09	14.33	14.37	0.05	0.28	-1.84	1.36	1.31	1.33	1.33	0.00	0.02	-0.03
8	25.55	17.30	18.35	18.56	0.22	1.27	-6.99	15.42	13.48	13.63	13.66	0.03	0.19	-1.76	1.31	1.27	1.28	1.28	0.00	0.01	-0.02
13	21.81	15.11	15.89	16.05	0.16	0.94	-5.76	15.03	13.17	13.29	13.31	0.02	0.14	-1.72	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
18	19.60	13.81	14.44	14.55	0.11	0.74	-5.05	14.79	12.99	13.08	13.10	0.02	0.11	-1.69	1.26	1.24	1.24	1.24	0.00	0.01	-0.02
23	18.13	12.95	13.49	13.57	0.08	0.62	-4.56	14.64	12.87	12.95	12.96	0.01	0.09	-1.67	1.25	1.23	1.23	1.23	0.00	0.01	-0.02
33	16.30	11.88	12.29	12.37	0.08	0.49	-3.93	14.44	12.72	12.78	12.79	0.01	0.07	-1.65	1.24	1.22	1.22	1.22	0.00	0.01	-0.02
43	15.20	11.24	11.55	11.63	0.08	0.39	-3.57	14.32	12.63	12.68	12.69	0.01	0.06	-1.64	1.23	1.21	1.21	1.21	0.00	0.00	-0.01
53	14.47	10.81	11.08	11.13	0.05	0.32	-3.33	14.24	12.57	12.61	12.61	0.01	0.05	-1.63	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
63	13.95	10.51	10.74	10.78	0.05	0.28	-3.16	14.19	12.52	12.56	12.57	0.01	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
73	13.54	10.28	10.48	10.52	0.04	0.25	-3.02	14.14	12.49	12.52	12.53	0.01	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
83	13.25	10.10	10.28	10.31	0.04	0.22	-2.93	14.11	12.47	12.49	12.50	0.01	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
93	13.00	9.95	10.12	10.15	0.04	0.20	-2.85	14.08	12.45	12.47	12.48	0.01	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
103	12.80	9.84	9.98	10.02	0.03	0.18	-2.78	14.06	12.43	12.45	12.46	0.01	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
128	12.42	9.62	9.74	9.77	0.03	0.15	-2.66	14.02	12.40	12.42	12.42	0.00	0.02	-1.60	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
153	12.16	9.46	9.57	9.59	0.02	0.13	-2.57	13.99	12.38	12.39	12.40	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
178	11.97	9.35	9.44	9.46	0.02	0.11	-2.51	13.97	12.36	12.37	12.38	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
203	11.83	9.27	9.35	9.36	0.02	0.10	-2.47	13.96	12.35	12.36	12.36	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
Receptor 6aSW – A22 at Royal Ashdown Forest Golf Course																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	52.74	33.68	36.72	37.27	0.55	3.58	-15.48	17.92	15.43	15.83	15.90	0.07	0.47	-2.02	1.48	1.41	1.44	1.44	0.01	0.03	-0.04
5	33.47	22.07	23.70	24.02	0.33	1.96	-9.44	16.09	13.98	14.20	14.24	0.04	0.26	-1.85	1.35	1.31	1.32	1.32	0.00	0.02	-0.03
10	26.29	17.80	18.92	19.14	0.22	1.34	-7.15	15.39	13.44	13.59	13.62	0.03	0.18	-1.77	1.30	1.27	1.28	1.28	0.00	0.01	-0.02
15	22.52	15.58	16.41	16.60	0.19	1.02	-5.92	15.02	13.16	13.27	13.29	0.02	0.14	-1.73	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
20	20.20	14.20	14.88	15.02	0.14	0.82	-5.18	14.79	12.98	13.07	13.09	0.02	0.11	-1.70	1.26	1.23	1.24	1.24	0.00	0.01	-0.02
30	17.50	12.61	13.10	13.19	0.08	0.57	-4.31	14.52	12.78	12.84	12.85	0.01	0.08	-1.67	1.24	1.22	1.22	1.23	0.00	0.01	-0.02
40	15.97	11.72	12.09	12.18	0.08	0.46	-3.79	14.37	12.66	12.71	12.72	0.01	0.06	-1.65	1.23	1.21	1.22	1.22	0.00	0.00	-0.02
50	15.01	11.15	11.47	11.52	0.05	0.37	-3.49	14.27	12.59	12.63	12.64	0.01	0.05	-1.64	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
60	14.33	10.75	11.01	11.06	0.05	0.31	-3.27	14.20	12.53	12.57	12.58	0.01	0.04	-1.63	1.22	1.20	1.21	1.21	0.00	0.00	-0.01
70	13.84	10.46	10.68	10.73	0.05	0.27	-3.11	14.15	12.50	12.53	12.53	0.01	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
80	13.46	10.24	10.43	10.47	0.04	0.24	-2.98	14.12	12.47	12.50	12.50	0.01	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
90	13.17	10.06	10.24	10.27	0.04	0.21	-2.90	14.09	12.45	12.47	12.47	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
100	12.93	9.92	10.08	10.11	0.03	0.19	-2.82	14.06	12.43	12.45	12.45	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
125	12.49	9.66	9.78	9.81	0.03	0.15	-2.68	14.02	12.39	12.41	12.42	0.00	0.02	-1.60	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
150	12.19	9.48	9.59	9.61	0.02	0.13	-2.58	13.99	12.37	12.39	12.39	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
175	11.98	9.36	9.45	9.47	0.02	0.11	-2.51	13.97	12.36	12.37	12.37	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	11.82	9.26	9.34	9.36	0.02	0.10	-2.46	13.95	12.34	12.35	12.36	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01

Receptor 6aSE – A22 at Royal Ashdown Forest Golf Course																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	62.84	39.74	43.54	44.09	0.55	4.35	-18.75	18.83	16.17	16.67	16.75	0.08	0.58	-2.08	1.55	1.46	1.50	1.50	0.01	0.04	-0.05
5	39.37	25.62	27.63	28.06	0.44	2.45	-11.30	16.65	14.43	14.70	14.75	0.05	0.33	-1.90	1.39	1.34	1.36	1.36	0.00	0.02	-0.03
10	30.66	20.44	21.87	22.14	0.27	1.70	-8.52	15.82	13.77	13.97	14.00	0.04	0.23	-1.82	1.34	1.29	1.31	1.31	0.00	0.02	-0.03
15	26.15	17.75	18.84	19.08	0.25	1.33	-7.07	15.38	13.43	13.58	13.61	0.03	0.18	-1.77	1.30	1.27	1.28	1.28	0.00	0.01	-0.02
20	23.34	16.08	16.98	17.17	0.19	1.09	-6.17	15.10	13.22	13.34	13.37	0.02	0.15	-1.74	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
30	20.06	14.13	14.80	14.93	0.14	0.80	-5.13	14.78	12.97	13.06	13.08	0.02	0.11	-1.70	1.26	1.23	1.24	1.24	0.00	0.01	-0.02
40	18.21	13.04	13.57	13.68	0.11	0.64	-4.53	14.59	12.83	12.90	12.92	0.01	0.09	-1.68	1.25	1.22	1.23	1.23	0.00	0.01	-0.02
50	17.03	12.35	12.80	12.89	0.08	0.54	-4.15	14.48	12.74	12.80	12.81	0.01	0.07	-1.66	1.24	1.22	1.22	1.22	0.00	0.01	-0.02
60	16.24	11.87	12.26	12.34	0.08	0.47	-3.90	14.40	12.68	12.73	12.74	0.01	0.06	-1.65	1.23	1.21	1.22	1.22	0.00	0.00	-0.02
70	15.64	11.52	11.88	11.96	0.08	0.44	-3.68	14.34	12.63	12.68	12.69	0.01	0.06	-1.64	1.23	1.21	1.21	1.21	0.00	0.00	-0.02
80	15.20	11.26	11.58	11.63	0.05	0.37	-3.57	14.29	12.60	12.64	12.65	0.01	0.05	-1.64	1.23	1.21	1.21	1.21	0.00	0.00	-0.01
90	14.85	11.05	11.36	11.41	0.05	0.36	-3.44	14.26	12.57	12.62	12.62	0.01	0.05	-1.63	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
100	14.55	10.88	11.16	11.21	0.06	0.33	-3.34	14.23	12.55	12.59	12.60	0.01	0.05	-1.63	1.22	1.20	1.21	1.21	0.00	0.00	-0.01
125	14.03	10.57	10.81	10.85	0.05	0.28	-3.18	14.17	12.51	12.55	12.55	0.01	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
150	13.65	10.35	10.56	10.60	0.04	0.25	-3.04	14.14	12.48	12.51	12.52	0.01	0.04	-1.62	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
175	13.38	10.19	10.37	10.42	0.04	0.23	-2.96	14.11	12.46	12.49	12.49	0.01	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
200	13.15	10.05	10.22	10.26	0.04	0.21	-2.89	14.08	12.44	12.47	12.47	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
Receptor 6aNE – A22 at Royal Ashdown Forest Golf Course																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	51.08	32.71	35.59	36.25	0.66	3.54	-14.83	17.79	15.33	15.72	15.80	0.08	0.47	-1.99	1.47	1.40	1.43	1.43	0.01	0.03	-0.04
5	34.10	22.46	24.12	24.48	0.35	2.02	-9.62	16.18	14.05	14.28	14.32	0.04	0.27	-1.86	1.36	1.31	1.33	1.33	0.00	0.02	-0.03
10	27.16	18.34	19.54	19.78	0.25	1.45	-7.38	15.51	13.53	13.69	13.73	0.03	0.19	-1.78	1.31	1.27	1.28	1.29	0.00	0.01	-0.02
15	23.45	16.13	17.05	17.25	0.19	1.11	-6.20	15.14	13.25	13.38	13.40	0.03	0.15	-1.74	1.29	1.25	1.26	1.26	0.00	0.01	-0.02
20	21.13	14.74	15.50	15.66	0.16	0.92	-5.47	14.91	13.07	13.18	13.20	0.02	0.13	-1.72	1.27	1.24	1.25	1.25	0.00	0.01	-0.02
30	18.32	13.08	13.64	13.75	0.11	0.67	-4.57	14.63	12.86	12.94	12.95	0.01	0.09	-1.68	1.25	1.23	1.23	1.23	0.00	0.01	-0.02
40	16.68	12.12	12.55	12.66	0.11	0.54	-4.02	14.47	12.74	12.80	12.81	0.01	0.07	-1.66	1.24	1.22	1.22	1.22	0.00	0.01	-0.02
50	15.61	11.48	11.84	11.92	0.08	0.44	-3.69	14.36	12.65	12.71	12.72	0.01	0.06	-1.65	1.23	1.21	1.21	1.21	0.00	0.00	-0.01
60	14.88	11.04	11.35	11.43	0.08	0.39	-3.45	14.29	12.60	12.64	12.65	0.01	0.05	-1.64	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
70	14.30	10.70	10.98	11.04	0.06	0.33	-3.27	14.23	12.55	12.59	12.60	0.01	0.05	-1.63	1.22	1.20	1.21	1.21	0.00	0.00	-0.01
80	13.87	10.44	10.69	10.74	0.05	0.30	-3.13	14.19	12.52	12.56	12.56	0.01	0.04	-1.63	1.22	1.20	1.20	1.20	0.00	0.00	-0.01
90	13.51	10.23	10.46	10.50	0.05	0.27	-3.01	14.15	12.49	12.52	12.53	0.01	0.04	-1.62	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
100	13.21	10.06	10.26	10.31	0.04	0.24	-2.91	14.12	12.47	12.50	12.51	0.01	0.03	-1.62	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
125	12.69	9.75	9.91	9.95	0.03	0.20	-2.74	14.07	12.43	12.45	12.46	0.00	0.03	-1.61	1.21	1.19	1.20	1.20	0.00	0.00	-0.01
150	12.32	9.53	9.67	9.70	0.03	0.16	-2.62	14.03	12.40	12.42	12.43	0.00	0.02	-1.60	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
175	12.05	9.37	9.49	9.52	0.02	0.14	-2.54	14.00	12.38	12.40	12.40	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	11.85	9.25	9.36	9.38	0.02	0.13	-2.47	13.98	12.37	12.38	12.38	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01

Receptor 33N – A22 at Wych Cross																					
Distance From Road (m)	Annual Mean NOx (ug/m ³)							Annual Mean Total N Dep (kg N/ha/yr)							Annual Mean Total N Acid Dep (keq/ha/yr)						
	BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change			BL	Proj BL	DN	DS	Change		
	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)	Baseline	Proj Baseline	(Base 2033)	(Scn1 2033)	(DS-DN)	(DS- ProjBL)	(DS- BL)
0	37.40	24.56	26.50	26.69	0.19	2.13	-10.71	16.70	14.51	14.79	14.82	0.03	0.31	-1.88	1.40	1.34	1.36	1.37	0.00	0.02	-0.03
5	26.02	17.73	18.86	18.97	0.11	1.23	-7.05	15.51	13.56	13.73	13.74	0.02	0.18	-1.77	1.31	1.28	1.29	1.29	0.00	0.01	-0.02
10	21.40	14.97	15.77	15.85	0.08	0.88	-5.55	15.02	13.18	13.30	13.31	0.01	0.13	-1.72	1.28	1.25	1.26	1.26	0.00	0.01	-0.02
15	18.94	13.50	14.11	14.19	0.08	0.69	-4.76	14.76	12.97	13.06	13.07	0.01	0.10	-1.69	1.26	1.23	1.24	1.24	0.00	0.01	-0.02
20	17.39	12.57	13.07	13.12	0.05	0.56	-4.27	14.59	12.84	12.92	12.92	0.01	0.08	-1.67	1.25	1.22	1.23	1.23	0.00	0.01	-0.02
30	15.53	11.47	11.84	11.87	0.03	0.40	-3.67	14.39	12.69	12.74	12.75	0.01	0.06	-1.65	1.23	1.21	1.22	1.22	0.00	0.00	-0.01
40	14.47	10.84	11.13	11.16	0.03	0.32	-3.31	14.28	12.60	12.64	12.65	0.00	0.05	-1.63	1.22	1.21	1.21	1.21	0.00	0.00	-0.01
50	13.79	10.42	10.67	10.69	0.03	0.27	-3.09	14.20	12.54	12.58	12.58	0.00	0.04	-1.62	1.22	1.20	1.21	1.21	0.00	0.00	-0.01
60	13.29	10.13	10.34	10.37	0.02	0.23	-2.93	14.15	12.50	12.53	12.53	0.00	0.03	-1.62	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
70	12.95	9.92	10.10	10.12	0.02	0.20	-2.82	14.11	12.47	12.50	12.50	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
80	12.67	9.75	9.92	9.94	0.02	0.18	-2.73	14.08	12.45	12.47	12.47	0.00	0.03	-1.61	1.21	1.20	1.20	1.20	0.00	0.00	-0.01
90	12.45	9.62	9.77	9.79	0.02	0.16	-2.66	14.06	12.43	12.45	12.45	0.00	0.03	-1.61	1.21	1.19	1.20	1.20	0.00	0.00	-0.01
100	12.27	9.52	9.65	9.67	0.02	0.15	-2.60	14.04	12.41	12.43	12.44	0.00	0.02	-1.60	1.21	1.19	1.19	1.19	0.00	0.00	-0.01
125	11.94	9.32	9.43	9.44	0.01	0.12	-2.50	14.00	12.39	12.40	12.40	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
150	11.71	9.18	9.28	9.29	0.01	0.11	-2.42	13.98	12.37	12.38	12.38	0.00	0.02	-1.60	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
175	11.54	9.08	9.16	9.18	0.01	0.09	-2.37	13.96	12.35	12.36	12.37	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01
200	11.42	9.01	9.08	9.09	0.01	0.08	-2.33	13.95	12.34	12.35	12.35	0.00	0.01	-1.59	1.20	1.19	1.19	1.19	0.00	0.00	-0.01

Appendix B. Extract from Caporn et al (2010)

Table 21 of Caporn et al (2010): Summary of relationships between long-term nitrogen deposition and species richness by habitat expressed as the amount of incremental N deposition (in kg N ha⁻¹ yr⁻¹) associated with a reduction in species richness of one species along the survey gradient sites. Modelled relationship only applied over N deposition range in which survey sites occurred; where no sites were surveyed at a given N deposition level '-' is shown.

Survey/ Habitat/	Max. species richness	Habitat/ species critical load kg N ha ⁻¹ yr ⁻¹	Increase in N deposition (in kg N ha ⁻¹ yr ⁻¹) required to reduce measured species richness by 1 at different background long-term N deposition levels					
			5 kg N	10 kg N	15 kg N	20 kg N	25 kg N	30 kg N
Upland heath (TU 2009)								
Total species richness	42 spp.	10-20	0.4 kg	0.8 kg	1.3 kg	1.7 kg	2.0 kg	2.4 kg
Upland heath (MRS)*								
Total species richness	16 spp.	10-20	1.7 kg	2.0 kg	2.5 kg	3.3 kg	5.0 kg	20.0 kg
Lowland heath (TU 2009)								
Total species richness	37 spp.	10-20	0.4 kg	0.8 kg	1.3 kg	1.7 kg	2.0 kg	2.4 kg
Bog (TU 2009)								
Total species richness	32 spp.	5-10			3.3 kg			
Sand dunes (TU 2009, all sites)								
Total species richness	77 spp.	8-15	0.1 kg	0.5 kg	1.1 kg	2.0 kg	-	-
Sand dunes TU 2009 (pH ≥6.5)								
Total species richness	77 spp.	8-15	0.3 kg	0.6 kg	0.9 kg	1.3 kg	-	-
Sand dunes TU 2009 + 2002 (Fixed dune grasslands)								
Total species richness	77 spp.	8-15	0.3 kg	0.6 kg	0.9 kg	1.3 kg	-	-
Acid grasslands (BEGIN)								
Total species richness	42 spp.	10-15	1.7 kg	1.7 kg	2.0 kg	2.0 kg	2.5 kg	2.5 kg

*in the upland heath MRS survey quadrat size was 0.5 x 0.5 m. This produced different results than the other surveys which used 2 x 2 m quadrats.

Appendix C. Annual Drop-off Calculations for Intermediate Years between 2017 and 2033

AECOM was asked to undertake calculations for intervening years between 2017 and 2033 (rather than simply the start year of 2017 and end year of 2033) in order to show whether NO_x emissions in any given year would increase for any period before a decrease was observed.

Traffic flow data for the interim years were derived from the 2033 traffic modelling for Tunbridge Wells Local Plan in late 2017. EFT v8.0.1 has been used to calculate annual drop off calculations to determine if there is a risk of an intermediate year having higher emissions than the scenarios currently tested by AECOM, although the latest modelling work for Ashdown Forest has used EFT v8.0.0. The differences in the EFT from V8.0.0 to v8.0.1 are reproduced below and should not affect this analysis. To confirm this interpretation the base 2017 and DN/DS 2033 traffic data used in the previous assessment has been reprocessed to confirm the suitability for comparison of the different EFT versions. Changes from EFT v8.0.0 to EFT v8.0.1:

- Bug fix to correct the bus and coach split on London roads when entering data using the Alternative Technologies traffic format input option only.
- Bug fixes to allow compatibility with Excel 2007 and 64-bit instances of Excel.

The drop off calculations have been calculated on the same basis as the 2033 assessment method utilised for the previous assessments, with only partial improvements assumed compared to DEFRA predictions. The emission year associated with each year of traffic data is as follows:

- Base 2017 traffic with 2017 emissions;
- 2020 traffic with 2018 emissions;
- 2023 traffic with 2019 emissions;
- 2025 traffic with 2020 emissions;
- 2028 traffic with 2021 emissions;
- 2031 traffic with 2022 emissions; and
- 2033 traffic with 2023 emissions (as presented in the assessments).

The following graphs, presented separately for the 'with' (DS) and 'without' (DN) plan scenarios, show the emissions per link for each of the above scenarios.

Figure 1. NOx Emission Rate (g/km/s) Per Year Per Link in DN Scenario

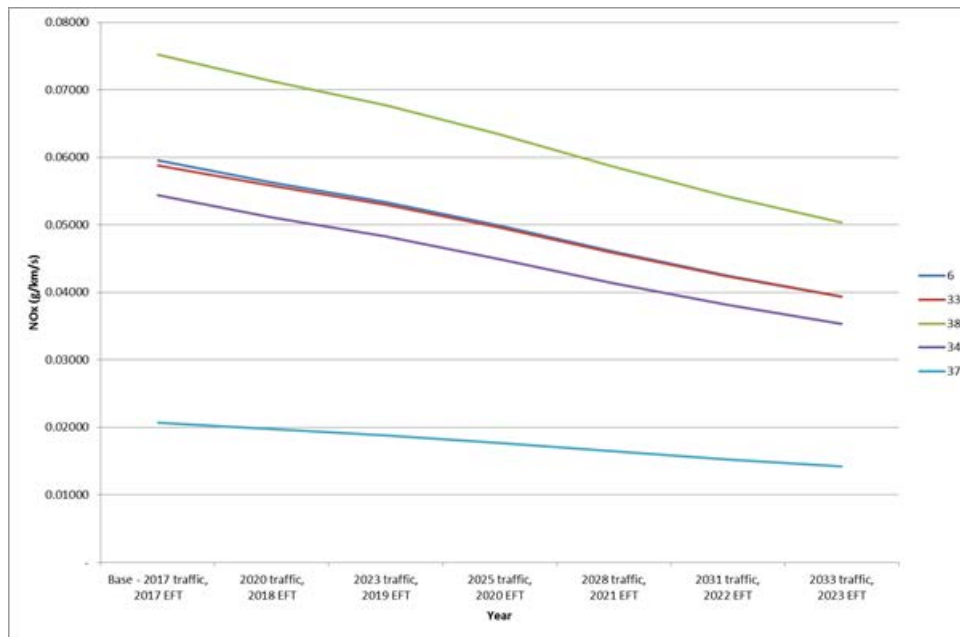
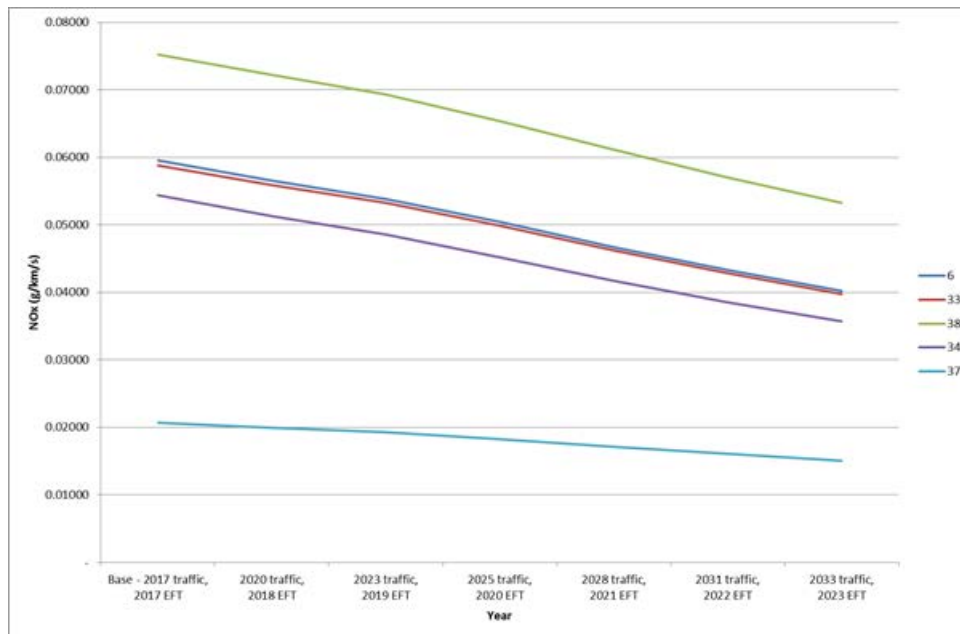


Figure 1 demonstrates that, for the DN scenario (i.e. all growth except Tunbridge Wells Local Plan, Lewes JCS and South Downs Local Plan), emission rates are projected to fall year on year for each link included in the AECOM modelling despite the growth in traffic projected in the DN scenario. Each coloured line below represents a separate link.

This effect is also present, although slightly less pronounced, in Figure 2, which represents the DS scenarios. The year on year fall in emissions trend remains the same. The effect is slightly less pronounced than in the DN graph due to the additional traffic from the Local Plans that are incorporated into the DS traffic flows.

Figure 2. NOx Emission Rate (g/km/s) Per Year Per Link in DS Scenario



This analysis has not been carried through into a dispersion model assessment as it is considered this presentation of emission rates clearly falling is sufficient to illustrate that despite the increase in vehicle numbers in the future the increases under the AECOM analysis approach are not of sufficient magnitude to result in an increase in emissions.

Summary

The interim year emissions calculations demonstrate that there are no points where the increase in traffic due to growth or the local plan offsets the improvements in emission rates over time (using conservative assumptions on improvements in emission rates). Therefore no change to standard assessment practice of considering the full plan period is proposed.

It is also essential to note that for vegetation long-term trends in air quality are more important than short-term fluctuations. The ecological effects of nitrogen deposition are most associated with persistent long-term exposure (i.e. many years). Whether growth will result (for example) in an increase in nitrogen deposition for a couple of years before improvements in emission factors and background rates ‘catch up’ would be less important than whether there will be a persistent net increase or decrease in deposition over the plan period.

Appendix D. Modelling ammonia emissions from traffic

Data Sources

The ammonia modelling has used 2015 road transport emission factors from the National Atmospheric Emissions Inventory website (NAEI, latest available data). This document produces average ammonia emission factors for various types of transport and environments in grams per kilometre (g/km). The NAEI road transport emission factors include average speed throughout the UK and the speeds used to derive these g/km emission rates may be different to the speeds used in the air quality model but this is a known limitation of the ammonia modelling.

Concentration data for the ammonia modelling from AQC transects has been made available in the partially redacted report however the coordinates of the monitoring locations have not been provided. All of the images and data relating the transects and location of the NH₃ sensors has been redacted save for the NO₂ monitored data maps (Figures A1.35 and A1.36 on pages 242/243 of AQC report). This NO₂ monitoring map has been used this to identify the location of the transects as both NO₂ and NH₃ were monitored on the transects. The transects have been identified from the following information:

- Transect 4 ends in monitoring location T18 and is near one of the AECOM modelled roads although NH₃ was not measured on this transect;
- Transect 1 is the only transect extending west as stated on page 14 of the AQC report;
- Transect 2 is opposite transect one as on page 88 it states “*The pattern of fall-off is much steeper for Transect 1 than for Transect 2 , which may reflect the influence of prevailing wind direction on roadside concentrations*”; and
- Transect 3 has “*relatively lower traffic volumes than the roads beside the other transects*” so must be located in isolation away from the other transects.

The AECOM model does not have a modelled link next to transect 3 therefore only transects 1 and 2 have been used to verify NH₃ predictions.

The coordinates for the NH₃ monitoring locations on transect 1 and 2 have been approximated as the specific coordinates for the monitored locations have been redacted. The approximate locations have been confirmed in Google Earth as the measurements sites are visible. These have been informed by the angle from the road in the NO₂ monitoring figure, distance from the road in the AQC report and given a height of 2m as the AQC report states that all ALPHA NH₃ models were at 2m.

A background concentration of 0.6 ug/m³ has been used from the NH₃ DELTA samplers in the AQC report which states that these were background locations.

The NH₃ measurement data in transects 1 and 2 as used in the verification are presented in Table 2.

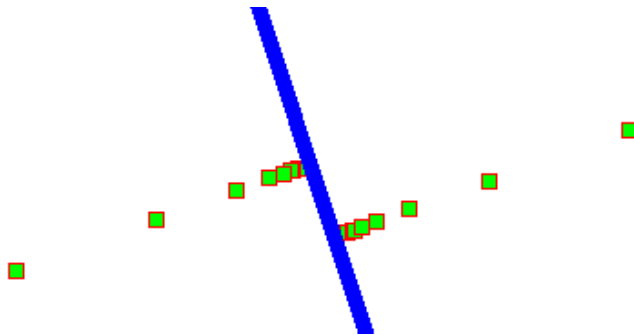
Table 2. Ammonia Monitoring

Transect	Distance from Road (m)	Measured Concentration (µg/m ³)
Transect 1	1.7	1.7
	2.5	1.3

	5.0	0.9
	10	0.9
	22	0.7
	100	0.6
Transect 2	1.7	1.4
	2.5	1.3
	5.0	1.0
	10	0.9
	22	0.7
	100	0.8

Source: AQC report- Ashdown Forest SAC, Air Quality Monitoring and Modelling, October 2017

Transects 1 and 2 are represented in the ADMS-Roads model as follows, with Transect 1 to the west, upwind of the road, and Transect 2 to the east, down wind of the road.



If the road was a notable source of ammonia it would be anticipated that Transect 2, as the downwind transect, would have higher concentrations than Transect 1. Whereas the measurement data shows the opposite trend at the closest points, with slightly higher ammonia concentrations upwind and identical concentrations at 5m.

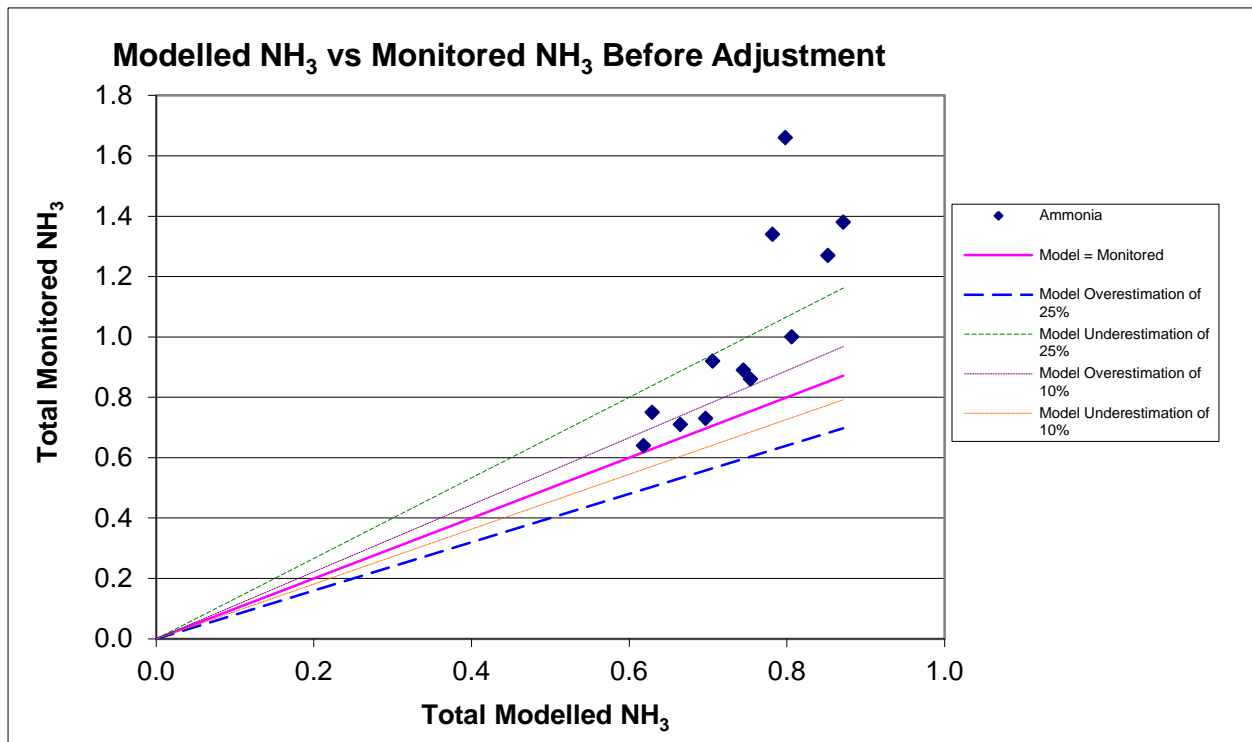
It can also be seen that concentrations of ammonia are very similar to measured background ammonia concentrations of $0.6 \mu\text{g}/\text{m}^3$ beyond 20m from the road. Any ammonia emissions due to the road are therefore considered to be observable in the measured data, but the patterns are less clear than would be expected from key road traffic pollutants (i.e. NO_x), even at the measurement points within 5m of the road and they are largely imperceptible beyond 20m.

The monitoring also shows an increase in ammonia concentrations at 100m on Transect 2, compared to closer points. This indicates that there is likely to be another source of ammonia in the vicinity of the monitoring and shows that other sources of ammonia may be more important locally than the road network.

Verification

Ammonia emissions were input based on a representative vehicle split for rural England in 2015 using data on vehicle fleet from the Emission Factor Toolkit published by Defra, and maintaining the light duty vehicle/heavy duty vehicle (LDV/HDV) split in the traffic data provided, using hot exhaust emission factors only from the NAEI 2015 road transport emission factors.

Plotting monitored vs modelled total NH₃ concentrations before any correction showed two clear patterns of behaviour with four points notably out of agreement with the rest of the dataset. These four points are the two closest points of each transect (at 1.7 and 2.5m) where concentrations are notably higher along with higher adjustment factors.



Using these input data an adjustment factor of **2.94** was calculated, with an RMSE of 0.2.

The adjustment of the ammonia model highlights that the ammonia model is less accurate close to the road source (e.g. at 1.7-2.5m from the road source). This supports the above observations of the measured ammonia concentrations that concentrations are most notably higher than background concentrations very close to the roads, as there is a larger under prediction at these verification locations closer to the road source. This under prediction doesn't appear to be due to canyoning effects as it is fairly open at this location. The resultant verification factor, if applied elsewhere, is therefore conservative as these closest points are included within the overall factor derived above.

Therefore, any ammonia predictions beyond this distance are likely to overestimate ammonia contributions, and beyond 20m, unless the road source is a much larger road than here, ammonia road contributions may not in reality be discernible at the ecosystem compared to normal ammonia background concentrations.

Assessment

Modelling has also been carried out to predict concentrations of ammonia and the influence of ammonia on nitrogen deposition rates using the methodology outlined above with the following assumptions for the assessment year:

- 2033 with and without the local plan traffic flows;
- 2023 traffic fleet mix (in keeping with NO_x predictions);
- 2015 ammonia emission rates (as projected rates are not available from the NAEI); and
- Measured background concentration of 0.6 µg/m³ (as projected concentrations are not available).

The contribution of ammonia to total nitrogen deposition was calculated using a deposition rate for ammonia of 0.02 m/s, taken from the CERC ADMS-Roads User Guide.

Even with the addition of ammonia as another source of nitrogen within the nitrogen deposition calculations, small rates of deposition are still predicted with a maximum change in deposition rate of 0.2 becoming 0.3 kg N ha⁻¹ yr⁻¹ at the edge of the road.

Appendix E. Commentary on Modelling Work Undertaken by Air Quality Consultants Ltd and on Wealden District Council's Response to South Downs Local Plan



Dr James Riley
AECOM
Midpoint
Alencon Link
Basingstoke,
Hampshire
RG21 7PP

Our Reference:

Date: 02 February 2018

SENT BY EMAIL ONLY

Dear Dr Riley,

Re: ASHDOWN FOREST HABITAT REGULATION ASSESSMENT

Thank you for the work you have been doing for Tunbridge Wells Borough Council in recent months, helping the Council grapple with the difficult issues arising out of the judgment in *Wealden DC v Secretary of State for Communities and Local Government* [2017] EWHC 351 (Admin).

The background is well known to you so I do not repeat it in detail here. Suffice to say that you have been assisting the Council in assessing whether planned growth in the Borough is likely – in combination with other plans and projects – to have significant adverse effects on the Ashdown Forest Special Area of Conservation ('SAC'). For this purpose, AECOM has produced a draft Air Quality Impact Assessment ('the AQIA'), assessing the likely air quality effects of planned growth in Tunbridge Wells Borough between 2017 – 2033 on the protected habitats in the Ashdown Forest. In parallel, AECOM has advised South Downs National Park on similar issues and produced a Habitats Regulations Assessment ('the HRA') of the emerging South Downs National Park Local Plan, which included a specific annex considering air quality issues specific to the Ashdown Forest. Both the AQIA and the HRA conclude that planned growth in each area is not likely – in combination with other plans and projects - to have significant adverse effects on the Ashdown Forest SAC.

As you know, Wealden District Council has made representations objecting to the methodology in the HRA (which is the same methodology used in the AQIA). It has published a report prepared by Air Quality Consultants ('the AQC Report') that adopts a different, non-standard, methodology and – in some respects – reaches different conclusions. Wealden has also made representations to a number of local authorities (including TWBC) objecting, in the absence of an appropriate assessment, to the determination of planning applications that are likely to generate traffic movements through the Ashdown Forest.

The local authorities affected by the Ashdown Forest air quality issues have formed an Ashdown Forest Working Group ('AFWG') to seek common ground and to narrow the issues in dispute. All parties are agreed that the authorities must act consistently with their legal duty to preserve the integrity of the protected habitat in the Ashdown Forest. The vast majority of participating authorities take the view that further growth can be achieved without breaching that duty and without the need for compensation or mitigation measures. Wealden DC, by contrast, appears to take the view that – in the absence of compensation or mitigation measures - further growth in the region is inconsistent with the legal duty under the Habitats Regulations.

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DX 3929 Tunbridge Wells website www.tunbridgewells.gov.uk

TWBC is anxious to ensure that it complies with its legal duties under the Habitats Regulations. In light of the AQC Report, the Council is aware that it might now be said that there is at least “reasonable scientific doubt” as to the question of whether the air quality impacts of planned growth in Tunbridge Wells Borough – in combination with other plans and projects - will have significant adverse effects on the integrity of the Ashdown Forest SAC. In informal discussions on this matter, you have expressed the view that (save for the issue of ammonia emissions that you have not yet assessed) there is no reasonable scientific doubt in relation to that question and you are confident that the methodology adopted in the HRA and the AQIA is appropriate and reliable.

With that in mind, the Council has provided you with (amongst other things): i) Wealden’s representations on the HRA; ii) the AQC Report; iii) the current draft of the Statement of Common Ground of the members of the AQWG; iv) a letter from Wealden DC to TWBC dated 10 January 2018 in relation to a planning application for development on Land South Of Woodham Hall; and v) the ‘Statement from Wealden District Council for the Ashdown Forest Local Authorities Group’ sent under cover of a letter from Wealden DC dated 30 January 2018.

The Council would like you / AECOM to consider that material and thereafter:

- (1) Finalise the TWBC AQIA, making amendments where necessary to take into account any new information, and providing an additional assessment of the likely effects of ammonia emissions on the Ashdown Forest SAC.
- (2) Produce an appendix to the AQIA to:
 - a. Explain why your assessment has not relied on the 1000 AADT threshold considered in the Wealden judgment.
 - b. Set out the key methodological differences between the AQC approach and the AECOM approach;
 - c. Explain why either i) the methodological differences between AECOM and AQC make no difference to the outcome of the assessment; or ii) the AECOM methodology is preferable. In particular:
 - i. Explain the evidential basis upon which AECOM has assumed an annual 1% decrease in background deposition rates and explain why that is a scientifically robust assumption notwithstanding historic over-estimates of predicted reductions and notwithstanding the AQC; and
 - ii. Explain the relevance of ecological interpretation in assessing the likely significant effects of air pollution on the SAC, and its significance in AECOM’s and AQC’s assessments
 - d. Give your expert opinion on whether all or any of the ‘scenarios’ modelled in the AQC Report are scientifically reasonable and, if so, what is the consequence for the Council’s ability to rely on AECOM’s conclusion that there are no likely significant adverse effects of planning growth in Tunbridge Wells Borough?
 - e. Address any miscellaneous points arising out of the representations made by Wealden DC in response to the HRA and/or in relation to planning applications to explain why the criticisms/representations made by Wealden DC are misplaced.

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- f. Explain the consequences of the results of the AQIA for the determination of planning applications in TWBC.

We would be grateful if you would provide the final AQIA and appendix by 9 February 2018.

Separately – but related - you have been working with the Council to consider options for revising the 7km zone for SAMM/SANG contributions relating to the Ashdown Forest's designation as a Special Protection Area. We would be grateful if you would provide a final report on that work by 9 February 2018.

Once we have had a chance to consider the final reports, the Council will produce a replacement Practice Note to guide planning decision makers when determining applications that may have an impact on the Ashdown Forest as a SAC / SPA.

Yours sincerely

A handwritten signature in black ink, consisting of a large 'S' followed by a stylized, cursive signature.

Stephen Baughen

Interim post: Building Control & Planning Policy Manager

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Appendix E. Commentary on modelling work undertaken by Air Quality Consultants for Wealden District Council and on Wealden District Council's response to the South Downs National Park Local Plan

In Stephen Baughen's letter dated 02/02/18 a series of points were set out (points 2a – 2e) that requested a response in addition to updating the Air Quality Impact Assessment. In those points AECOM was asked to:

'Produce an appendix to the AQIA to:

- a) Explain why your assessment has not relied on the 1000 AADT threshold considered in the Wealden judgment.*
- b) Set out the key methodological differences between the AQC approach and the AECOM approach;*
- c) Explain why either i) the methodological differences between AECOM and AQC make no difference to the outcome of the assessment; or ii) the AECOM methodology is preferable. In particular:*
- d) Explain the evidential basis upon which AECOM has assumed an annual 1% decrease in background deposition rates and explain why that is a scientifically robust assumption notwithstanding historic over-estimates of predicted reductions and notwithstanding the AQC;*
- e) Explain the relevance of ecological interpretation in assessing the likely significant effects of air pollution on the SAC, and its significance in AECOM's and AQC's assessments*
- f) Give your expert opinion on whether all or any of the 'scenarios' modelled in the AQC Report are scientifically reasonable and, if so, what is the consequence for the Council's ability to rely on AECOM's conclusion that there are no likely significant adverse effects of planning growth in Tunbridge Wells Borough?*
- g) Address any miscellaneous points arising out of the representations made by Wealden DC in response to the HRA and/or in relation to planning applications to explain why the criticisms/representations made by Wealden DC are misplaced'.*

The below response covers these points and constitutes the requested Appendix.

Point 1(a) – the use of the 1,000 AADT metric

The Wealden vs. Lewes case has undermined the value of the 1,000 AADT metric entirely. There are several fundamental points regarding the 1,000 AADT metric, which we cover below:

1. It was only ever intended as a shorthand method to decide whether it is worth doing actual air quality modelling; the figure of 1,000 AADT has no special air quality significance in itself (other than being widely agreed in the industry that, when translated into air quality modelling, a change of less than 1,000 AADT generally works out to be a change in nitrogen deposition rate so far below any damage threshold that it could be ignored);
2. It was only ever intended to be a first stage in the traffic/air quality assessment process. The core of the assessment process is the air quality modelling which is in any case a more robust way of examining impacts than simply scrutinising AADTs since it allows fleet composition, average vehicle speeds, habitat structure (in broad terms e.g. woodland or grassland), meteorology etc. to be taken into consideration, all of which influence deposition of pollutants.

Therefore, if you have undertaken air quality calculations anyway, the 1,000 AADT metric is irrelevant as its only value is in determining if it is worth performing such calculations. Since the High Court case the main practical change has been the general abandonment of the 1,000 AADT metric: to use it cumulatively requires all the detailed traffic modelling that one would need for the air quality calculations anyway, so one may as well proceed straight to the air quality modelling.

This has the advantage of being a much more nuanced assessment than simply summing AADTs (see point 2 above) and is also inherently cumulative/in combination due to the way the models are built.

Points 2(b) to 2(f) – comparison between the AECOM modelling and Air Quality Consultant's modelling

The key differences in modelling approach between the AQC work and AECOM work

The key differences in modelling approach between the AECOM and AQC assessments are:

- Pollutants considered;
 - Both assessments have considered NO_x concentrations, ammonia, nitrogen deposition and acid deposition;
 - AQC also considered nitric oxide (NO), nitrogen dioxide (NO₂), particulate ammonium (NH₄⁺), airborne reduced nitrogen (NH_x)² and particulate nitrate (NO₃)³.
- Air Quality model verification;
 - AQC utilised a single monitoring location for verification for Lewes Downs SAC. This monitoring point was located in a canyon location along the A26 (as described in Lewes Downs SAC Air Quality Assessment, Appendix A2 Modelling Methodology, paragraph A2.3) and was modelled using a canyon module to represent the specific reduced dispersion of pollutants associated with canyon locations and so higher concentrations within canyons. However, AQC did not use the canyon module elsewhere in the modelling indicating that the wider area (i.e. the Lewes Downs SAC under consideration) was not considered to be a canyon. The verification used therefore was optimised to describe pollutant concentrations at the canyon along part of the A26 and not the Lewes Downs SAC and so it is unclear how this will have better represented emissions within the ecosystem);
- Background concentrations;
 - AECOM used Defra background maps;
 - AQC also used Defra background maps but carried out an additional calibration step using national monitoring data uplifting NO_x background concentrations by 9.4% (as described in Lewes Downs SAC Air Quality Assessment, Appendix A2 Modelling Methodology, paragraph A2.8). The methodology for derivation of this factor is not provided fully in the document referenced (AQC, 2016, Deriving Background Concentrations of NO_x and NO₂ for use with CURED V2A), noting this calibration is based on background sites in the Automatic Urban and Rural Monitoring Network (AURN). However, the method does not indicate whether this calibration is based on all 'urban background' locations, 'suburban background' locations or 'rural background' locations, noting one example of a site at London Hillingdon that has been excluded. A review of Figure 6, (op cit.) suggests that approximately 50 background sites have been used, but that the relationship against the Defra background map is largely good, with a number of outlier points, suggesting that a wider review of sites, such as the review which excluded London Hillingdon had been carried out, may identify that there are other sites that should be excluded or that sites should be better grouped to describe specific types of site (e.g. urban or rural locations). This may then result in a different calibration factor being derived for 2014 for this type of location. It should also be noted that applying this same AQC calibration step to a baseline year of 2015 would result in a reduction of NO_x of 0.09%. Therefore, whilst this additional calibration step has been used the factor employed may or may not be appropriate for the Lewes Downs SAC.
 - In those projects where baseline data has been gathered AECOM presents annual averages. Very unusually, AQC have not presented their monitoring data for annual periods, despite this being possible for a large proportion of the data collected so showing normal year to year variations in pollutant concentrations is possible but not presented. Monitoring data is presented for 2 years of data collection up to the summer of 2016. Therefore, as the report was published in October 2017 three years of data should have been available for consideration. Although, data was installed at a variety of points within the study a large proportion of data is available for 24 months or a large percentage of 24 months.

However, curiously data is not presented as annual averages, but as a two year average. Significantly, this prevents the reader from understanding variations between the years of monitoring data as would be expected from annual monitoring surveys.

- Deposition rates;
 - AECOM used deposition rates taken from APIS using a standard fixed deposition velocity (based on DMRB guidance), although sensitivity testing has been undertaken using the higher velocities referenced in the AQC report.
 - AQC used an approach where deposition rates were taken from APIS and using a standard fixed deposition velocity and also a temporally-variable approach to calculating deposition fluxes. Paragraph 7.25 of the AQC report indicates that the modelling method used here involves much higher nitrogen deposition velocities than those used in standard modelling which will partly explain the greater forecast deposition rates that those identified in the AECOM report which uses the standard methods and deposition velocities.
- Future air quality assumptions (NO_x);
 - AECOM typically prepare two scenarios:
 - one assuming all Defra improvements (Emission Factor Toolkit (EFT)); and
 - one with background concentrations and emission rates from approximate midpoint (e.g. 2023 for a 2030 plan) – this second scenario represents reasonable worst case. For the purposes of the modelling of Ashdown Forest only this scenario is reported.
 - AQC presented three scenarios:
 - official predictions using Defra rates of improvement;
 - a sensitivity test using the in-house CURED approach; and
 - no improvements in air quality.
- Future air quality assumptions (nitrogen deposition)
 - AECOM assessments typically assume c.1% reduction per year in background deposition rate, which is half the amount advised in DMRB HA207/07 Annex F and so includes consideration of uncertainty in the rates of reduction over time in nitrogen deposition.
 - AQC prepared an assessment assuming that background nitrogen deposition rates will hold constant at the average 2013-2015 value, on the basis that there is a non-linear relationship between NO_x emissions and N-deposition rates.

The AQC modelling includes 24-hour NO_x (known as the short-term critical level). The ecological value of the 24hr NO_x metric is limited. The WHO (2000) guidelines include a short-term (24 hour average) NO_x critical level of 75 µg/m³. Originally set at 200 µg/m³, the guideline was considerably lowered in 2000 to reflect the fact that, globally, short-term episodes of elevated NO_x concentrations are often combined with elevated concentrations of O₃ or SO₂, which can cause effects to be observed at lower NO_x concentrations. However, high concentrations of O₃ and SO₂ are rarely recorded in the UK. As such, there is reason to conclude that in the UK the short-term NO_x concentration mean is not especially ecologically useful as a threshold. The Centre for Ecology & Hydrology have commented that '*UN/ECE Working Group on Effects strongly recommended the use of the annual mean value, as the long-term effects of NO_x are thought to be more significant than the short-term effects*'⁴².

The AECOM report models all receptors as if they represented the 'ideal' habitat (heathland). In contrast, the AQC report models the habitats that are actually currently present. For the most affected areas this is woodland. However, woodland is not an SAC feature, so effects of the woodland are not relevant to consideration of impacts on the ability of the SAC to achieve its conservation objectives (the primary requirement of the HRA process). Woodland has a higher deposition flux

⁴² Sutton MA, Howard CM, Erismann JW, Billen G, Bleeker A, Grennfelt P, van Grinsven H, Grizzetti B. 2013. The European Nitrogen Assessment: Sources, Effects and Policy Perspectives. Page 414. Cambridge University Press. 664pp. ISBN-10: 1107006120
June 2011. Manual on Methodologies and Criteria for Modelling and Mapping Critical Loads & Levels and Air Pollution Effects, Risks and Trends. Chapter 3: Mapping Critical Levels for Vegetation

than heathland; for this reason (and because of the use of higher deposition velocities as already mentioned) the modelled nitrogen deposition rates reported are often higher than in the AECOM model.

Why the AECOM approach is preferable

The AQC approach presents four unrealistically conservative future scenarios and two that we consider unrealistically optimistic. The most realistic scenarios presented by AQC (Scenarios 3 and 5) apply some conservatism to future emissions from diesel vehicles but assume all other future improvements occur as currently anticipated by Government, which is likely to present a too optimistic picture.

In contrast, the approach to future rates of deposition in the less realistic scenarios are very conservative, assuming no change in background deposition rates despite noting within their report that since 1988 total nitrogen deposition has reduced by 13%, illustrating the presence of an existing improving trend. The deposition rate calculations undertaken by AQC utilising a temporally variable approach is not based on guidance and it is unclear exactly how the variable values were calculated.

It is considered by AECOM, and also stated in paragraph 7.33 of the AQC report, that the future situation is most likely to be somewhere between the scenarios presented in the AQC report (paragraph 7.33 *“Overall, the future-year deposition projections will have a level of uncertainty associated with them, but it is not unreasonable to expect the reality to lie somewhere between the different scenarios that have been modelled.”*) i.e. somewhat less optimistic than AQC Scenarios 3 and 5 but considerably better than the other AQC Scenarios.

AECOM's modelled scenario falls into this middle ground. The AECOM approach is based on published methods and guidance documents, (e.g. Defra and DMRB), with conservative assumptions made where appropriate (e.g. partial future improvements in concentrations, emissions and deposition rates). The AECOM approach predicts a scientifically reasonable realistic worst case assessment of future air quality and deposition, rather than a range of overly conservative or optimistic predictions. For example, with regard to nitrogen deposition the AQC report produced for Ashdown Forest SAC states in paragraph 3.10 that since 1988, the total deposition of nitrogen has decreased by 13%. Paragraph 7.30 of the same report states that oxidised nitrogen deposition decreased by 14% between 1988 and 2010. This is an improvement of 0.59% (total nitrogen) or 0.64% (oxidised nitrogen) per annum on average. The AECOM modelling assumes a modest improvement in background nitrogen deposition from 2017 to 2033 equivalent to 0.75% per annum on average. This is not a substantive difference from past trends, and as new vehicles (i.e. Euro 6/VI) with reduced emissions replace older vehicles in the vehicle fleet it makes sense to allow for a slightly increased average rate of improvement in the future. This can be seen in the real world emission tests reported in the Department for Transport Vehicle Emissions Testing Programme (2016) which shows that under real world driving conditions Euro 6 emissions are on average lower than the older Euro 5 standard.

The AQC study uses a bespoke modelling method for nitrogen deposition. They relate it to an Environment Agency study published in 2008 (paragraph 7.22). However, paragraph 7.24 of the AQC report acknowledges that one of the drawbacks of the bespoke 'first principles' method is that *‘... some of the parameters used in the deposition model are highly uncertain’* and that small variations in some, such as stomatal resistance, could have quite large effects on the resulting deposition fluxes. All forecasting methods have their benefits and drawbacks and one risk of using an extremely complex model is that there is more room for uncertainties to affect the results due to the greater number of uncertain parameters in the model.

Whether any or all of the AQC 'scenarios' represent a scientifically 'reasonable' approach

Seven scenarios have been considered within the AQC report:

- Scenario 1 is a scientifically reasonable representation of current baseline but only represents the baseline rather than any forecasting.
- Scenarios 2 (without the Wealden Local Plan) and 4 (with the Wealden Local Plan) postulate future (2028) scenarios assuming **no** improvements in any rates (emissions, deposition), backgrounds etc. Since they assume no

improvement whatsoever (and thus a reversal of long-established trends), these are considered to be an unrealistically pessimistic assessment of the future situation and thus not scientifically reasonable. Even the AQC Ashdown Forest and Lewes Downs reports acknowledge as much. The AQC Ashdown Forest report states (in paragraph 7.11) that *'It is considered that, with respect to vehicular NOx emissions, Scenarios 3 and 5 provide a reasonable worst-case assessment, while Scenarios 2, 4, 6, and 7 provide an extreme worst-case upper-bound'*. In the Lewes Downs report AQC state that *'The results from the sensitivity test and worst-case scenario are likely to over-predict emissions from vehicles in the future'*.

- Scenarios 3 (without the Wealden Local Plan) and 5 (with the Wealden Local Plan) represent the future (2028) scenarios assuming that projected DMRB/Defra improvements in rates (emissions, deposition), backgrounds etc. are **fully** realised. AQC's assessment utilises their bespoke CURED tool to apply a more pessimistic view of improvements in diesel emissions for the future scenario than the published Defra emission rates. This is therefore likely to contain a more reasonable assessment of future emissions than other scenarios assessed; however as only one parameter has been adjusted to account for reduced optimism in future emission rates, whilst assuming full projected improvements in deposition rates and background concentrations, it is likely that these scenarios will present an unrealistically optimistic assessment of the future situation.
- Scenarios 6 (without the Wealden Local Plan) and 7 (with the Wealden Local Plan) postulate the future (2028) scenarios assuming emissions per vehicle, primary NO₂ proportions, and rural background ozone concentrations remain at 2015 values (i.e. no improvement), but with HNO₃, particulate deposition, and wet deposition projected to 2028. These scenarios are also considered to be unrealistically pessimistic and thus scientifically unreasonable, for the same reasons as Scenarios 2 and 4.

In AECOM's view the most scientifically reasonable scenario(s) that AQC have postulated are Scenario 3/5 (although we nonetheless consider them to be excessively optimistic in their assumptions of improvements in background emissions and deposition rates). These are the scenarios that mirror the trends the AECOM analysis has forecast:

- With regard to 'in combination' trends in NOx concentrations, paragraphs 10.55 and 10.56 of the AQC report state that: ***'Predicted annual mean NOx concentrations in 2028 with the Local Plan are, in this emissions scenario [Scenario 5], lower than those at present. This is because the predicted changes in emissions from the average road vehicle more than offset the increases in traffic that are predicted over the same period. Over most of the SAC, the predicted reductions in NOx concentrations are less than 4 µg/m³, but close to roads the reductions are greater, with changes [reductions] greater than 8 µg/m³ predicted alongside many of the roads'***.
- With regard to trends in nitrogen deposition rates, paragraph 10.72 of the AQC report states that *'Increases [in nitrogen deposition due to the Wealden Local Plan] greater than 0.05 kg-N/ha/yr are predicted in the vicinity of roads, but extend out up to almost 300 m from the A22 and 100 m from the B2026. **Increases greater than 1 kg-N/ha/yr [due to the Wealden Local Plan] are predicted close to the A22'***. However, when moving to the 'in combination' discussion, paragraph 10.77 makes it clear that these 'increases' are considerably more than offset by a forecast large net reduction in nitrogen deposition. Paragraph 10.77 says: *'For the reasons explained for NOx concentrations, nitrogen deposition is predicted to reduce across the entire SAC in this scenario comparison. The minimum reduction is 0.8 kg-N/ha/yr, which is predicted to occur at background locations to short vegetation. **The maximum reduction is 14 kg-N/ha/yr, which is predicted to occur to woodland alongside the A22.** The reductions are higher where the baseline fluxes are highest (i.e. over woodland and close to roads) because this is where the anticipated reductions in NOx emissions per vehicle are predicted to have the greatest effect'*.

Whether the results of that scientifically reasonable approach are ecologically significant and why

The overall trends and relationships in AQC Scenarios 3/5 (the only scenario(s) we consider broadly reasonable) are similar to the trends and relationships that AECOM has forecast, notwithstanding the very different modelling methods.

The forecast contribution of future traffic to nitrogen deposition is considerably greater in the AQC model (more than 1 kgN/ha/yr at the roadside of the A22 at Wych Cross) than in the AECOM model (0.31 kgN/ha/yr at the same location). Similarly, AQC's forecast net improvement in nitrogen deposition (a reduction of 14 kgN/ha/yr adjacent to the A22 at Wych Cross) is much greater than that forecast by AECOM (a reduction of 1.89 kgN/ha/yr forecast for the same location). However, these differences are likely due to a combination of the different habitats modelled (woodland in the AQC work, heathland in the AECOM work), the very different deposition modelling methods used and (regarding improvements in background) the fact that AQC postulate a percentage improvement in deposition (23%) that is nearly double that in the AECOM model (12%) and apply this to a higher baseline deposition rate (60 kgN/ha/yr adjacent to the A22 at Wych Cross according to paragraph 9.19 of the AQC report, compared to 15kgN/ha/yr at the same location in the AECOM model)⁴³.

The actual rates and concentrations are thus different between the two models, **but** the ecological interpretation of Scenarios 3/5 of the AQC modelling would mirror that of the AECOM scenario. A significant net improvement in nitrogen deposition is forecast even allowing for future growth and the forecast nitrogen contribution of that 'in combination' growth is not only more than offset by the expected improvement (which is expected to be an order of magnitude greater than the contribution of the additional traffic) but is unlikely to result in a measurable retardation in any heathland vegetation recovery/establishment that might otherwise occur. For example, Table 21 of NECR2010 records that at baseline deposition rates of 30kgN/ha/yr (the highest deposition rate cited in that report) a reduction in species richness equivalent to '1' (i.e. a reduction in the frequency with which at least 1 species was encountered in a given sample quadrat) was associated in heathland with a dose (incremental increase) of 2.4kgN/ha/yr. While no areas with deposition rates as high as 60kgN/ha/yr were covered by the analyses in NECR2010 it is reasonable to conclude that the documented trend (i.e. an ever larger dose of nitrogen required to achieve the same negative effect as baseline deposition rates rise) will continue or level off at deposition rates above 30 kgN/ha/yr. Southon et al (2013) studied over fifty heathlands across England at deposition rates of up to 32.4kgN/ha/yr and found that above 20 kgN/ha/yr '*... declines in species richness plateaued, indicating a reduction in sensitivity as N loading increased*'.

In the Statement of Common Ground being drawn up between the various authorities surrounding Ashdown Forest, Wealden District Council has argued that Natural England Research Report NECR2010 is not applicable to Ashdown Forest on the basis that:

- The report did not include Ashdown Forest itself in its sample and thus did not include the influence of local conditions at that site, including the current condition of the heathland;
- There was limited coverage of heathland sites located in the south-east of England; and
- The analysis did not include wet heath.

In fact, the heathland sites covered by the research reported in NECR2010 had a wide geographic spread and were subject to a range of different 'conditions' but the identified trends were nonetheless observable. The fact that a given heathland site may not have been included in the sample cannot be a basis for the identified trend to be dismissed as inapplicable. On the contrary, the value of the available dose-response research is precisely in the fact that it covers a geographic range of sites subject to a mixture of different influences that might otherwise mask the nitrogen relationships if a given site was looked at in isolation. NECR2010 illustrates that consistent trends have been identified *despite* the differing geographic locations of those habitats and different conditions at the sites involved.

Heathland and acid grassland (a related habitat that is often found intermixed with heathland) have been particularly well studied across broad geographical, climatic and pollution gradients covering different levels of soil organic matter, rates of nutrient cycling, plant species assemblages and management regimes. Despite this, the overall trends, including that a given 'dose' of nitrogen generally has less effect on a range of vegetation parameters as background deposition rates rise has been reported by various peer reviewed academic papers⁴⁴. Southon et al (2013) surveyed 52 heathlands across

⁴³ This difference in baseline rates is because the AECOM model uses Defra modelled baseline data and models heathland at this location, while AQC uses local measured data and models woodland at this location.

⁴⁴ Stevens, C. J.; Dise, N. B.; Gowing, D. J. G. and Mountford, J. O. (2006). Loss of forb diversity in relation to nitrogen deposition in the UK: regional trends and potential controls. *Global Change Biology*, 12(10), pp. 1823–1833.

England and observed statistically significant trends despite the large differences in conditions of these heathlands. That paper specifically states that '*the biggest reductions in species number [were] associated with increasing N inputs at the low end of the deposition range*' and that '*The similarity of relationships between upland and lowland environments, across broad spatial and climatic gradients, highlights the ubiquity of relationships with N*'.

Based on the consistent trend across the range of habitats studied (including wet habitats such as bogs as well as lowland heathland, upland heathland and dune systems) there is no basis to assume that the identified trends would not be applicable to all types of heath, including wet heath. Upland heathlands tend to be wetter than lowland heathlands due to climate differences and yet the same pattern has been observed as reported in Southon et al (2013).

Due to the existence of other influences (such as management) that have a much greater effect on relevant vegetation parameters than does nitrogen deposition, there can be no absolute certainty that the reported trends would be observed in a given part of Ashdown Forest. However, there is a reasonable scientific expectation that the observed relationships would be detected if Ashdown Forest was included in the broader sample.

Point 2(g) – g) Address any miscellaneous points arising out of the representations made by Wealden DC in response to the HRA

AECOM is aware that Wealden District Council submitted a response to the South Downs National Park Local Plan consultation which made a number of criticisms of AECOM's original modelling work undertaken in summer 2017. We respond to the relevant points below.

Complaint 1: Failure to take account in the Lewes Downs SAC modelling of additional Wealden growth identified since 2015

This complaint does not relate to Ashdown Forest and so a substantive response is not provided here.

Complaint 2: Failure to take account of growth that has already been delivered prior to 2017 in the Ashdown Forest modelling

The model does include traffic already on the network, and thus includes the role of development completed prior to 2017. The 'Do Something' 2033 air quality forecast includes existing NOx concentrations and nitrogen deposition (and thus the projects/plans that will have contributed to them). Doing so illustrates that, even including both the existing traffic and further emissions/deposition due to additional traffic, there is forecast to be a net improvement in air quality by 2033 due to projected improvements in those background concentrations/rates and vehicle emission factors.

Complaint 3: Suggestion that the area affected by exhaust emissions can extend beyond 200m

In all cases our modelled transects show that NOx concentrations and nitrogen deposition rates are forecast to fall to background levels well before 200m from the roadside. In any event the greatest impact will always be recorded closest to the road and using this roadside data will provide the most precautionary assessment. Therefore there is no value in extending transects any further.

Complaint 4: Failure to take account of uncertainty regarding improvements in emissions and deposition

The specific comment made by Wealden was as follows: '*There is uncertainty with regards to projected future vehicle emissions of NOx and this alone would mean that a precautionary approach should be used within the HRA. If there is a decrease in NOx concentrations from vehicles, the interaction between NOx and nitrogen deposition has not been considered as well as the role of ammonia in this regard. This is a particular issue as the levels of emissions of ammonia*

Southon GE, Field C, Caporn SJM, Britton AJ, Power SA (2013) Nitrogen Deposition Reduces Plant Diversity and Alters Ecosystem Functioning: Field-Scale Evidence from a Nationwide Survey of UK Heathlands. PLoS ONE 8(4): e59031. doi:10.1371/journal.pone.0059031

Stevens, Carly; Dupre, Cecilia; Dorland, Edu; Gaudnik, Cassandre; Gowing, David J. G.; Bleeker, Albert; Diekmann, Martin; Alard, Didier; Bobbink, Roland; Fowler, David; Corcket, Emmanuel; Mountford, J. Owen; Vandvik, Vigdis; Aarrestad, Per Arild; Muller, Serge and Dise, Nancy B. (2010). Nitrogen deposition threatens species richness of grasslands across Europe. Environmental Pollution, 158(9), pp. 2940–2945.

from vehicles in the future is unknown, is not currently regulated, and there is a potential for emissions to increase. This provides an added reason for the need to apply the precautionary principle when considering the impact of emissions. In this regard the HRA is considered to be incomplete.'

The appropriate use of the precautionary principle is not simply to assume that the worst outcome conceivable is the one that will happen. It also involves making a balanced judgment based on past trends and the likelihood of those trends continuing or increasing. There is a long history of improving trends in key pollutants (notably NO_x) and in nitrogen deposition rates, and there is no reason to expect that will suddenly cease; on the contrary, as new vehicles (i.e. Euro 6/VI) with reduced emissions replace older vehicles in the vehicle fleet it makes sense to allow for a slightly increased average rate of improvement in the future. This can be seen in the real world emission tests reported in the Department for Transport Vehicle Emissions Testing Programme (2016) which shows that under real world driving conditions Euro 6 emissions are on average lower than the older Euro 5 standard. AECOM has therefore made a precautionary allowance for improvements in background NO_x concentrations. On the other hand, in our ammonia modelling no allowance has been made for improvement in background concentrations.

With regard to nitrogen deposition the AQC report produced for Ashdown Forest SAC states in paragraph 3.10 that total nitrogen deposition (i.e. taking account of both reduced and oxidised nitrogen) decreased by 13% between 1988 and 2010. This is an improvement of 0.59% (total nitrogen) per annum on average. The AECOM modelling assumes an improvement in background nitrogen deposition from 2017 to 2033 equivalent to 0.75% per annum on average. This is not a substantive difference, and given the introduction of new vehicles with reduced emissions (as described above) it makes sense to allow for a slightly increased average rate of improvement in the future. The AECOM assessment presents a realistic worst-case that is considerably more cautious than those advocated in the only available Government guidance on the issue (Defra concerning NO_x rates of improvement and DMRB concerning rates of N-deposition improvements).

While the AQC reports produced for Wealden District Council include numerous scenarios that assume no improvement in background emissions and deposition rates (and thus a net deterioration in both), we note that AQC themselves do not consider those scenarios to be realistic. The AQC Ashdown Forest report states in paragraph 7.11 that *'It is considered that, with respect to vehicular NO_x emissions, Scenarios 3 and 5 [which make significant allowances for improvement in NO_x concentrations and background nitrogen deposition rates] provide a **reasonable** [emphasis added] worst-case assessment, while Scenarios 2, 4, 6, and 7 [which make no allowance for improvement in background] provide an **extreme** [emphasis added] worst-case upper-bound*. An 'extreme' case, while not impossible, is unreasonable and unrealistic almost by definition. Similarly, in the Lewes Downs report AQC state that *'The results from the sensitivity test and worst-case scenario are likely to over-predict emissions from vehicles in the future'*. AECOM agrees with the statement in paragraph 7.33 of the AQC Ashdown Forest report that *'Overall, the future-year deposition projections will have a level of uncertainty associated with them, but it is not unreasonable to expect the reality to lie somewhere between the different scenarios that have been modelled.'* i.e. somewhat less optimistic than AQC Scenarios 3 and 5 but considerably better than the other AQC Scenarios. AECOM's modelled scenario falls into this middle ground.

Complaint 5: 'The modelling only considers the base date and one date in the future (last year of the Plan period). By assuming that there is a reduction by the end of the plan period it cannot take into account the potential damage caused by the emissions at the higher level (earlier in the plan period).'

Appendix C of AECOM's updated modelling report contains an analysis of intervening years between 2017 and 2033 to confirm that year-on-year net improvement in emissions is expected. Moreover, for vegetation, long-term trends in air quality are more important than short-term fluctuations. The ecological effects of nitrogen deposition are most associated with persistent long-term exposure (i.e. many years). Whether growth will result (for example) in an increase in nitrogen deposition for a couple of years before improvements in emission factors and background rates 'catch up' would be less important than whether there will be a persistent net increase or decrease in deposition over the plan period.

Complaint 6: Failure to account for ammonia emissions

AECOM's modelling has been updated to account for ammonia emissions. Due to the aforementioned uncertainties no allowance for improvement in background ammonia concentrations has been factored into AECOM's modelling.

Complaint 7: Failure to consider air quality impacts on Pevensey Levels SAC

This complaint does not relate to Ashdown Forest and so a substantive response is not provided here.

Complaint 8: Suggestion that the model/scenarios in the AQC report are 'better' than the standard method

The AQC studies use a bespoke modelling method for nitrogen deposition that goes back to first principles (such as stomatal resistance), but is related to an Environment Agency study published in 2008 (paragraph 7.22). The fact that a given model is more detailed or elaborate does not necessarily mean it is any more likely to accurately forecast local air quality by 2033 because there is a need to make judgment-based decisions over parameters and future trends that may or may not be correct whatever model is used. One risk of using a complex model is its inherent complexity: there are a large number of parameters in the model and greatly varying levels of certainty in those parameters. Paragraph 7.24 of the AQC report acknowledges this where it states that '*... some of the parameters used in the deposition model are highly uncertain*' and notes that small variations in some, such as stomatal resistance, could have quite large effects on the resulting deposition fluxes. This doesn't mean that such a model shouldn't be used if desired but given the uncertainties in any forecasting it is at least equally defensible to follow the existing simpler method that is deployed as standard good practice and supported by Natural England. While there are uncertainties in (for example) the relationship between NOx concentrations and nitrogen deposition these must be addressed whatever model is used and the improvements in nitrogen deposition rate included in the AECOM modelling are in line with recorded trends, as identified earlier in this note.

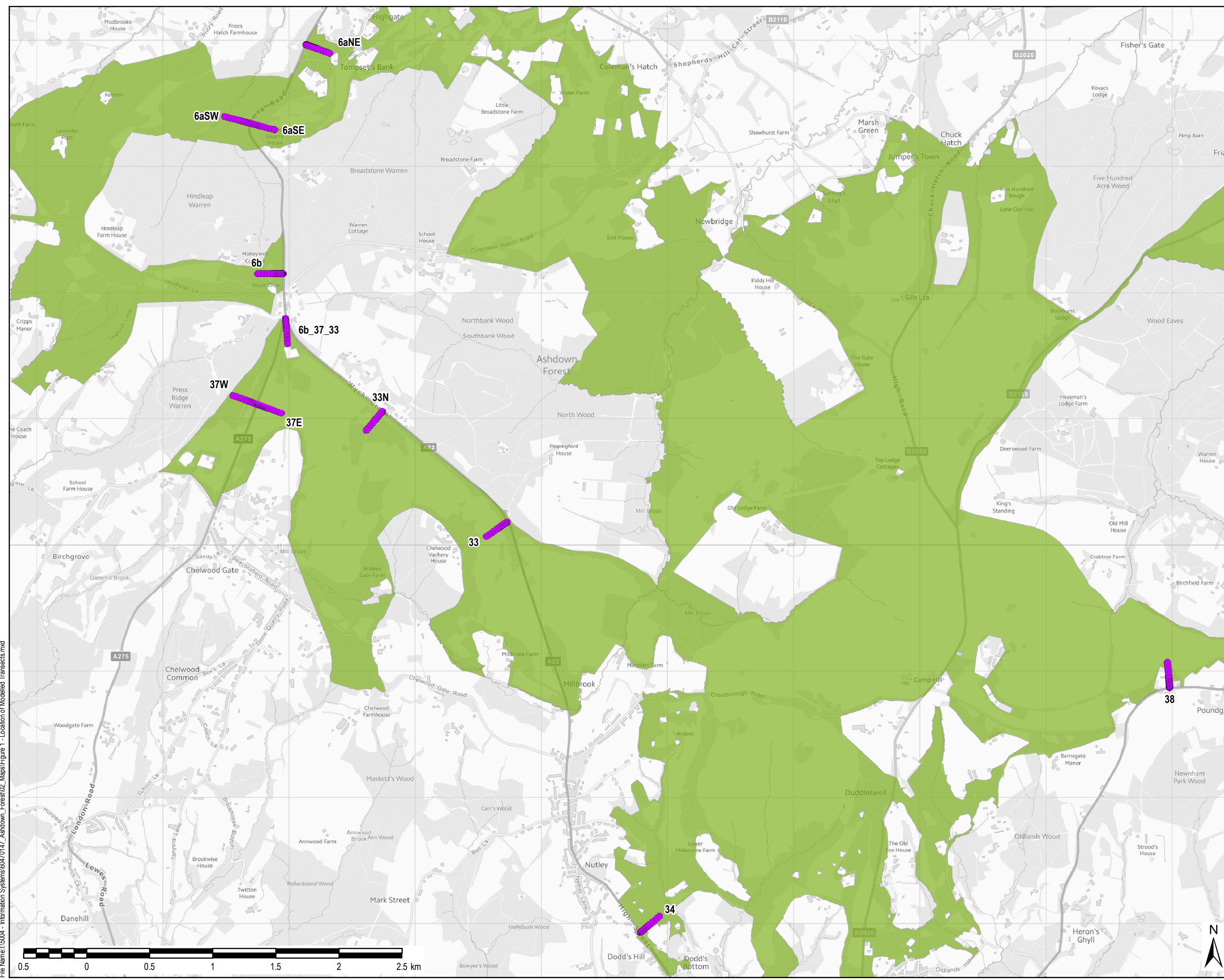
The Wealden studies prepared by AQC have modelled a range of scenarios which differ greatly in their outcomes for the same traffic data, ranging from predicting a large net increase in nitrogen deposition to predicting a large net reduction. AQC acknowledge in their reports that most of their modelled scenarios are unrealistic. The scenario that AQC themselves identify as being most realistic (Scenarios 3 and 5 in the Ashdown Forest report) broadly correspond with the AECOM modelling, notwithstanding the considerable difference in methodological details. It forecasts additional nitrogen deposition due to additional traffic but predicts that this will be more than offset by improvements in background and emission factors, leading to a large net reduction in nitrogen deposition. Indeed, the allowances made in the AECOM modelling for improvements in background rates/concentrations and emission factors are actually more conservative than those in AQC scenarios 3 and 5.

Complaint 9: It is considered that Plans that allocate sites, and propose that these sites are deliverable, should have a greater level of assessment than a strategic plan which does not distribute growth to certain areas

For Ashdown Forest we have modelled growth across South Downs and Lewes District, Tunbridge Wells Borough and Sevenoaks District in detail (i.e. using information on site allocations).

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

- LEGEND**
- Modelled Receptor
 - Ashdown Forest Special Area of Conservation (SAC)



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Purpose of Issue
FINAL

Client
SOUTH DOWNS NATIONAL PARK AUTHORITY AND LEWES DISTRICT COUNCIL

Project Title
AIR QUALITY ASSESSMENT FOR ASHDOWN FOREST SAC

Drawing Title
LOCATIONS OF MODELLED TRANSECTS

Drawn CN	Checked JW	Approved JR	Date 13/09/2017
AECOM Internal Project No. 60470147		Scale @ A3 1:27,500	

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Drawing Number
FIGURE 1

Rev
01

File Name: I:\5004 - Information Systems\60470147_Ashdown_Forest\02_Maps\Figure 1 - Location of Modelled Transects.mxd

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Is the final decision on the recommendations in this report to be made at this meeting?

Yes

Ashdown Forest Air Quality Impact Assessment and revised Habitat Regulation Assessment Practice Note

Final Decision-Maker	Full Council
Portfolio Holder(s)	Councillor Alan McDermott – Portfolio Holder for Planning and Transportation
Lead Director	Lee Colyer – Director of Finance, Policy & Development
Head of Service	Karen Fossett – Head of Planning Services
Lead Officer/Author	David Scully – Landscape and Biodiversity Officer
Classification	Non-exempt
Wards affected	All

This report makes the following recommendations to the final decision-maker:

1. That the contents and conclusions of the detailed technical report titled Ashdown Forest Air Quality Impact Assessment 2018, set out at appendix A to the report, be noted;
2. That the discussions and conclusions with regards the Councils approach to Ashdown Forest and objections received from Wealden District Council in relation to planning applications within the Borough and the Councils current Practice Note in relation to possible adverse effects on Ashdown Forest in the report titled Ashdown Forest – Discussions on Air Quality dated 29 March 2018, set out at Appendix B to the report, be noted; and
3. That the revised Practice Note to inform development management decisions in relation to the application of the Habitat Regulations with regards possible adverse effects on Ashdown Forest, set out at Appendix C to the report, be adopted.

This report relates to the following Five Year Plan Key Objectives:

The proper consideration and application of the Habitat Regulations will ensure

- A Prosperous Borough – through avoiding delays in planning consents
- A Green Borough – through protecting the natural environment and international sites such as Ashdown Forest

Timetable	
<i>Meeting</i>	<i>Date</i>
Management Board	28 February 2018
Planning and Transportations Cabinet Advisory Board	19 March 2018 and subsequent meeting on 10 April 2018
Cabinet	12 April 2018
Council	25 April 2018

Tunbridge Wells Committee Report, version: January 2018

Ashdown Forest Air Quality Impact Assessment and revised Habitat Regulation Assessment Practice Note

1. PURPOSE OF REPORT AND EXECUTIVE SUMMARY

- 1.1 For the past four years, Tunbridge Wells Borough Council has been applying a Practice Note (Appendix D) for the application of the Habitat Regulations in connection with European protected sites to assist in determining individual planning applications that might possibly affect Ashdown Forest Special Area of Conservation (SAC) and Special Protection Area (SPA), a European site. Since that practice note was prepared there have been some changes in circumstances and a series of objections from Wealden District Council that called into question TWBC's approach. Further details on these matters are provided in Ashdown Forest Discussions on Air Quality Appendix B.
 - 1.2 In response to those changes and the objections Tunbridge Wells Borough Council commissioned additional studies and sought legal advice the outcomes of which will need to be reflected in a revised Practice Note.
 - 1.3 The purpose of this report is to set out the relevant matters before members, provide an overview of the work that has been undertaken in regard to this matter and to provide a commentary on the ongoing work and discussions with other Councils including Wealden District Council who have unilaterally raised objections to this Councils approach to Ashdown Forest and the application of the Habitat Regulations.
 - 1.4 The work undertaken has been difficult owing to the prospect of legal challenge and differing views between authorities and complex, owing the technical nature of the subjects of traffic modelling, air quality and ecological studies, resulting in a number of iterations of the Air Quality study and supporting work. This has inevitably delayed bringing this matter to Members such that it is now important that we bring the matter to the first available meeting of Full Council.
 - 1.5 Unfortunately these delays have meant that we were not able to present the full report(s) to Planning and Transportation Cabinet Advisory Board on the 19 March 2018 and so at the request of the Advisory Board a further meeting has been organised for them on the 10 April 2018 prior to the meeting of the Cabinet so that they may fully consider the issue and offer their recommendation to Cabinet.
-

2. INTRODUCTION AND BACKGROUND

- 2.1 Ashdown Forest is a Natura 2000 site and is also known as a European site. It is designated as a Special Area of Conservation (SAC) for its heathland habitat and as a Special Protection Area (SPA) for the bird species that it supports. It contains one of the largest single continuous blocks of lowland heath in south-east England, with both European dry heaths and, in a larger proportion, wet heath. The site was designated as an SAC on account of the following interest features and species:
- Wet heathland and dry heathland
 - Great crested newts
- 2.2 The site was designated as an SPA on account of the following species
- Nightjar
 - Woodlark
- 2.3 The Conservation of Habitats and Species Regulations 2017, also known as the Habitat Regulations, requires the competent authority (which, in the context of planning decision-making is the local planning authority) to consider whether it can exclude the possibility that 'likely significant effects' on a European site will arise from a plan or project (which includes Local Plans and planning applications). If not, the competent authority must conduct an appropriate assessment of the effects of the plan or project on the European site. A planning permission may be granted and/or a Local Plan adopted only if likely significant effects can be excluded at the 'screening' stage, or if an appropriate assessment concludes that the plan or project will not adversely affect the integrity of the European Site.
- 2.4 At both the screening and appropriate assessment stage, the assessment of effects must take into account the effect of the plan or project considered in combination with the effects of other plans and projects. A decision to grant planning permission should normally only to be made if there is no reasonable scientific doubt (the precautionary principle) that there will be no adverse effects as a result of the development.

The regulations state;

“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.” (Article 6 (3) Habitats Directive 1992)

“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” (regulation 63 of the Conservation of Habitats & Species Regulations 2017).

- 2.5 The protected heathland in the Ashdown Forest SAC is vulnerable to atmospheric pollution from a number of sources including motor vehicles. There is a potential impact pathway from new development and associated increases in traffic flows on the roads such as the A275, A22 and A26, which traverse or run adjacent to the SAC. The emissions from these vehicles may cause a harmful increase in atmospheric pollutants which may adversely affect the integrity of the European site. The Ashdown Forest Air Quality Impact Assessment 2018 (Appendix A) has been undertaken to assess – in combination with other plans and projects - the likely air quality impacts on the SAC resulting from the increase in traffic caused by growth planned in Tunbridge Wells Borough.
- 2.6 The approach to and content of the Air Quality report is set out in more detail in Appendix B section 7.0 but has throughout taken a precautionary approach.
- 2.7 The Ashdown Forest Air Quality Impact Assessment 2018 has been informed by the Council's participation in the Ashdown Forest Working Group, a partnership of Planning Authorities potentially affected by Ashdown Forest Air Quality issues, including Wealden DC. The Working Group was convened to ensure that the impacts of development proposals in emerging local plans on Ashdown Forest are properly assessed through Habitats Regulations Assessments ('HRAs') and that, if required, a joint action plan is put in place should such a need arise. The Working Group has agreed to work collaboratively on the issues, to share information and existing work, and to prepare a Statement of Common Ground. The group is chaired by South Downs National Park Authority and supported by Natural England. The work on the Statement of Common Ground was chaired by a representative of the Planning Advisory Service. Further information on this is set out in Appendix B Section 7.
- 2.8 Through the work of this group and direct contact with Wealden DC it is clear that Wealden's view is that the air quality situation near the key road links in or adjacent to the SAC are such that a planning permission that generates a single additional vehicle movement through or adjacent to the SAC, when considered in combination with the additional vehicle movements generated by other plans and projects, risks having a Likely Significant Effect on the integrity of the SAC. The nature and details of the objections made by Wealden DC to the alternative view taken by this and other planning authorities is set out in some detail in Appendix B Section 6 and details of this Council's response to those objections are in Section 7.
- 2.9 Wealden DC's position is not shared by any other authority and is not supported by any evidence TWBC Planning has seen. The Ashdown Forest Air Quality Impact Assessment 2018 Appendix A concludes at 4.1.4

"It is therefore concluded that no adverse effect upon the integrity of Ashdown Forest SAC is expected to result from development provided by the Tunbridge

Wells Local Plan, even in combination with other plans and projects. This is due to a combination of a) an expected net improvement in air quality over the Local Plan period, b) the fact that, whether or not that improvement occurs to the extent forecast, the contribution of the Tunbridge Wells Local Plan to changes in roadside air quality is demonstrably ecologically negligible due to the very small magnitude and c) the precautionary nature of the modelling”.

2.10 In coming to this conclusion the authors of the Air Quality Impact Assessment 2018 were asked to respond to Wealden DC’s criticism of the work done for South Downs National Park Authority, which was based on the same traffic and air quality model used in our own Air Quality Impact Assessment 2018, and to review and respond to an alternative modelling exercise carried out on behalf of Wealden DC. These responses are contained in appendix E of Appendix A to this report: Ashdown Forest Air Quality Impact Assessment 2018. AECOM has advised that, notwithstanding Wealden DC’s position, there is no reasonable scientific doubt about its conclusion that the proposed growth in TWBC will have no adverse effect on the integrity of the Ashdown Forest SAC, either alone or in combination with other plans and projects.

2.11 Natural England as the statutory consultee on HRAs was consulted on both the Ashdown Forest Air Quality Impact Assessment 2018 (Appendix A) and the Practice Note 2018 (Appendix C). Their response received on 26 March 2018 confirmed that the reports are acceptable and that modelled development within Tunbridge Wells Borough will not have an adverse effect on Ashdown Forest:

“In general both the Air Quality Impact Assessment and the HRA Practice Note are concise, well-reasoned and well referenced and I can confirm that the approaches taken are acceptable.

I concur with the conclusions reached within the Air Quality Impact Assessment that the Tunbridge Wells Borough Council Local Plan will not have an adverse effect on the integrity of Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA).

I support the approach taken in the HRA Practice note and consider that development coming forward that falls within the framework of the overarching AQ modelling will not have an adverse effect on the integrity of Ashdown Forest SAC or SPA”.

2.12 The Ashdown Forest SPA species are also vulnerable to visitor pressure which may increase as a result of new development close to the site. This matter is under review with partner authorities including Natural England and Wealden DC. When that review is concluded (expected April/May 2018), any necessary changes will be dealt with separately as a Supplementary Planning Document that will go through the full statutory and internal procedures for such publications. Until then, the draft Practice Note maintains the pre-existing approach when considering the likely effects of development on visitor pressure on the SPA. Further details on this issue are provided in Appendix B.

3. AVAILABLE OPTIONS

- 3.1 Do nothing: it is likely that in the absence of the approved and published Ashdown Forest Air Quality Impact Assessment 2018 or similar document and an approved means of applying the findings to planning applications (the Practice Note 2018 Appendix C) that the Council would face legal challenges to its decision making process leading to a possible restriction on development.
 - 3.2 Delay the adoption of the Practice Note 2018 (Appendix C) until Wealden DC publish a new Local Plan and supporting Habitat Regulation Assessment: the Wealden Local Plan has been repeatedly delayed and its publication remains uncertain and WDC has stated that its decision to object to planning applications is based on existing publicly available information and the work completed by TWBC has been approved by Natural England and so it would appear that nothing further can be gained by waiting. Delay in adopting the practice note will expose the Council to possible legal challenges to its decision making process leading to a possible restriction on development.
 - 3.3 Subject to the comments of Members or other comments received and noting the findings of the Ashdown Forest Air Quality Impact Assessment 2018 the report recommends adoption of the revised Practice Note as recommended for the reasons set out in this report.
-

4. PREFERRED OPTION AND REASONS FOR RECOMMENDATIONS

- 4.1 Members are recommended to note the findings of the Ashdown Forest Air Quality Impact Assessment 2018 and to support the adoption of a revised Practice Note to guide decision makers – in light of those findings - when discharging their functions as competent authority under the Habitats Regulations. The Practice Note will be taken to Full Council for approval and adoption for use in development management decisions.
- 4.2 This course of action will enable the Council to undertake development management decisions in accordance with current legislation and best practice and will minimise the risk of legal challenge from Wealden DC and others to planning decisions made by the Council.
- 4.3 The purpose of the Practice Note is not to set planning policy or to bypass the requirements of the Conservation of Habitats and Species Regulations 2017. Instead, it is to provide guidance to applicants for planning permission on the practice generally adopted by the Council's decision makers when considering compliance with regulation 63 of the 2017 Regulations.
- 4.4 It provides guidance on when proposed development is likely to be 'screened out' as not requiring further assessment. In that way, it can help developers determine the amount of information that will be required to determine the application.

- 4.5 The Ashdown Forest Air Quality Impact Assessment 2018 is based on current best practice and takes account of a wide range of recent information as set out in Appendix B Section 7, including recent case law and advice from Counsel.
- 4.6 The assessment has benefited from discussions undertaken and information received as part of the Ashdown Forest Air Quality Group, the Ashdown Forest Visitor Group, discussions individually and collectively (with other LPAs) with Wealden DC and advice and comment from Natural England. The work has benefited from close collaboration with other Councils and in particular South Downs National Park Authority and Lewes District Council. As such officers believe that this work is robust, and based on a precautionary approach that goes beyond what would normally be required for such circumstances and is an important outcome of its Duty to Cooperate with other Planning Authorities.
-

5. CONSULTATION RESULTS AND PREVIOUS COMMITTEE FEEDBACK

- 5.1 Natural England have been consulted on the various drafts of this work and have been consulted on the drafts and the final Ashdown Forest Air Quality Impact Assessment 2018 appendix A and the revised Practice Note Appendix C and have confirmed that both are acceptable. Natural England has been supportive and helpful throughout this process. There is also an ongoing dialogue with the members of the Ashdown Forest Working Group.
- 5.2 All members of the Ashdown Forest Working Group, including Wealden DC, will be notified of the publication of these papers for Cabinet. Any comments received will be reported to Cabinet/Full Council as appropriate.

RECOMMENDATION FROM CABINET ADVISORY BOARD

- 5.3 The Planning and Transportation Cabinet Advisory Board were initially consulted on this decision on 19 March 2018 and agreed the following recommendations:

That the Cabinet Advisory Board defers coming to a conclusion on this issue, by virtue of there being inadequate evidence at this point, and reconvenes before 12 April, to be able to advise the Cabinet.

- 5.4 A further meeting of the Planning and Transportation Advisory Board was held on 10 April 2018 and the Board agreed the following recommendation:

That the recommendation set out in the report be supported

RECOMMENDATION FROM CABINET

- 5.5 The Cabinet considered the report at its meeting on 12 April 2018 and resolved as follows:

That Full Council be recommended:

1. That the contents and conclusions of the detailed technical report titled Ashdown Forest Air Quality Impact Assessment 2018, set out at appendix A to the report, be noted;
2. That the discussions and conclusions with regards the Councils approach to Ashdown Forest and objections received from Wealden District Council in relation to planning applications within the Borough and the Councils current Practice Note in relation to possible adverse effects on Ashdown Forest in the report titled Ashdown Forest – Discussions on Air Quality dated 29 March 2018, set out at Appendix B to the report, be noted; and
3. That the revised Practice Note to inform development management decisions in relation to the application of the Habitat Regulations with regards possible adverse effects on Ashdown Forest, set out at Appendix C to the report, be adopted.

6. NEXT STEPS: COMMUNICATION AND IMPLEMENTATION OF THE DECISION

- 6.1 Officers will continue to work with the Council's consultants and seek Counsel's opinion on any change in circumstances related to HRA matters or Ashdown Forest up to Full Council on 25 April and report them to Cabinet/Full Council as appropriate.
- 6.2 As noted above the Ashdown Forest Air Quality group will be notified of the publication of these papers. All comments received will be reported to Cabinet/Full Council as appropriate.
- 6.3 Subject to resolution by Full Council the decision will be published in the normal way and a notice will be put on the Councils web site in an appropriate location.

7. CROSS-CUTTING ISSUES AND IMPLICATIONS

Issue	Implications	Sign-off
Legal including Human Rights Act	This work will ensure compliance with the Habitats Regulations in so far as they apply to planning decisions by this Council.	Susan Mauger Senior Planning Lawyer 05/03/2018
Finance and other resources	Resources for this work have been allocated from existing planning services budgets	Lee Colyer Director of Finance, Policy & Development 22/03/2018

Staffing establishment	Can be delivered within existing resources	Nicky Carter Head of Human Resources and Customer Services 22/03/2018
Risk management	<p>This work does not feature explicitly on the Risk Register. However there are significant risks associated with not adopting the note:</p> <ul style="list-style-type: none"> - Possible challenges to Council decisions with associated cost and delays to determination of other applications; - Delays in determining applications can result in a vicious cycle of planning by appeal, with the potential impact/consequences of Risk Scenario 8 on the Risk Register including community dissatisfaction, loss of local decision making capability, appeal related costs etc; - Ultimately, risk of restricting planned development with implications for meeting economic and housing need. <p>Operational risks are the responsibility of the report author, which they will need to sign off themselves following discussion with their Head of Service or Director. If you need advice or want to discuss any aspect of risk management before completing your comments please contact the Head of Audit Partnership.</p>	David Scully Landscape and Biodiversity Officer 22/03/2018
Data Protection	No implications	David Scully Landscape and Biodiversity Officer 22/03/2018
Environment and sustainability	This work is required to satisfy the requirements of the Habitats Regulations and to ensure that development within Tunbridge Wells Borough will not have an adverse effect on Natura 2000 sites.	David Scully Landscape and Biodiversity Officer 22/03/2018

Community safety	No implications	David Scully Landscape and Biodiversity Officer 22/03/2018
Health and Safety	No implications	
Health and wellbeing	No implications	
Equalities	No implications	

8. REPORT APPENDICES

The following documents are to be published with and form part of the report:

- Appendix A: Ashdown Forest Air Quality impact Assessment 2018
- Appendix B: Ashdown Forest Discussions on Air Quality 29 March 2018
- Appendix C: Practice Note 2018 Ashdown Forest screening of planning applications for compliance with the Habitat Regulations
- Appendix D: 2013 NE Approved Final Combined Advice Note Concerning HRA of Planning Applications

9. BACKGROUND PAPERS

None

ASHDOWN FOREST DISCUSSIONS ON AIR QUALITY

Officers Report 29 March 2018

1.0 Introduction

- 1.1 The purpose of this paper is to set out for Members the studies, discussions and considerations that have taken place in recent months with regards to Ashdown Forest and air quality issues in connection with development in Tunbridge Wells Borough. It covers for completeness the issue of visitor pressure noting that full details of that issue are to be dealt with at a later date.

2.0 Ashdown Forest and the Habitat Regulations

- 2.1 Ashdown Forest is a Natura 2000 site and is also known as a European site. It is designated as a Special Area of Conservation (SAC) for its heathland habitat and as a Special Protection Area (SPA) for the bird species that it supports. It contains one of the largest single continuous blocks of lowland heath in south-east England, with both European dry heaths and, in a larger proportion, wet heath.
- 2.2 The site was designated as an SAC on account of the following interest features and species:
- Wet heathland and dry heathland
 - Great crested newts
- 2.3 The site was designated as an SPA on account of the following species:
- Nightjar
 - Woodlark
- 2.4 The Conservation of Habitats and Species Regulations 2017, also known as the Habitat Regulations, requires the competent authority (which, in the context of planning decision-making is the local planning authority) to consider

whether it can exclude the possibility that 'likely significant effects' on a European site will arise from a plan or project (which includes Local Plans and planning applications). If not, the competent authority must conduct an appropriate assessment of the effects of the plan or project on the European site. A planning permission may be granted and/or a Local Plan adopted only if likely significant effects can be excluded at the 'screening' stage, or if an appropriate assessment concludes that the plan or project will not adversely affect the integrity of the European Site.

2.5 At both the screening and appropriate assessment stage, the assessment of effects must take into account the effect of the plan or project considered in combination with the effects of other plans and projects. A decision to grant planning permission should normally only be made if there is no reasonable scientific doubt (the precautionary principle) that there will be no adverse effects as a result of the development.

2.6 The regulations state;

"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." (Article 6 (3) Habitats Directive 1992)

"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" (regulation 63 of the Conservation of Habitats & Species Regulations 2017).

3.0 The Ashdown Forest issues for Tunbridge Wells Borough

3.1 The protected heathland in the Ashdown Forest SAC is vulnerable to atmospheric pollution from a number of sources including motor vehicles.

There is a potential impact pathway from new development and associated increases in traffic flows on the roads such as the A275, A22 and A26, which traverse or run adjacent to the SAC. The emissions from these vehicles may cause a harmful increase in atmospheric pollutants which may adversely affect the integrity of the European site. The primary pollutants of concern are nitrogen oxides (NOx) arising from vehicle emissions. Nitrogen oxides can cause harm to the protected heathland by increasing the rate of nitrogen deposition. The addition of nitrogen is a form of fertilization, which can have a negative effect on heathland and other habitats over time by encouraging more competitive plant species that can force out the less competitive species that are more characteristic. This is the **Air Quality** issue.

- 3.2 The Ashdown Forest SPA species are vulnerable to visitor pressure (i.e. disturbance of ground nesting birds by walkers and dogs off leads) which may increase as a result of new development close to the site. The special character and size of Ashdown Forest is such that it attracts visitors from some distance. This is the **Visitor** issue.
- 3.3 Consequently it has been necessary for Tunbridge Wells Borough Council (TWBC) to consider these two issues, **Air Quality** and **Visitors** as part of its plan making and development management decisions. Typically and as happened here at Tunbridge Wells BC the issues were addressed through a HRA that accompanied Local Plan documents, in our case the Core Strategy and then the Allocations DPD.
- 3.4 Those studies, approved through the relevant Public Inquiries/Hearings concluded that **Air Quality** was not an issue for development in Tunbridge Wells Borough. They did conclude that there was an issue with regards **Visitors** arising from new development in areas within the Borough that were close to the Ashdown Forest. Consequently to address that issue a zone of 7km from Ashdown Forest for new development, within which any additional residential units would need to make a financial contribution to Strategic Site Access Management and Monitoring (SAMMS) was agreed. The SAMMS is

a series of measures to mitigate against the harmful effects of visitor pressure and includes a program to reduce problems with dog behaviour on the Forest.

- 3.5 Following adoption of the Core Strategy and Allocations DPD an internal Practice Note for Tunbridge Wells BC, approved by Natural England, was written to assist officers in applying the findings of the HRA to individual planning applications making sure that matters relating to Ashdown Forest were adequately addressed. To date, since the adoption of the Practice Note only one relevant planning application within the 7km zone, which affects only the extreme west of the Borough around Groombridge and Ashurst, has been received. Wealden DC did not object to the original HRAs or Practice Note when published.

4.0 What has changed: Visitors

- 4.1 Since 2012 the Council has been working with Wealden District Council and other authorities that might be affected by visitor pressure issues to develop a SAMMS project that would allow development within the 7km zone to proceed and more recently to commission and receive an updated visitor survey (completed September 2016). This matter, including appropriate zones for SAMMS, is now under review with partner authorities including Natural England and Wealden DC. When that review is concluded (expected April/May 2018), any necessary changes will be dealt with separately as a Supplementary Planning Document that will go through the full statutory and internal procedures for such publications.

5.0 What has changed: Air Quality

- 5.1 Since the original Practice Note was prepared there has been a change in circumstances that has called into question the reliance of this Council on the Practice Note in respect of its conclusions with regards air quality. In March 2017 a High Court decision (the Wealden Judgement), in a case brought by Wealden District Council against South Downs National Park Authority and

Lewes District Council to adopt a joint Core Strategy in the face of an objection from Wealden DC, found that those Authorities had not, despite following advice from Natural England, properly considered the 'in combination' effect of all relevant plans and projects in terms of air quality potentially harming the Forest. The basis of this objection was the method by which those authorities had concluded that their plan would not give rise to a 'likely significant effect' was flawed and did not in fact address properly the in combination assessment required by the Habitats Directive. The Courts upheld this view but provided little in the way of how the assessment should be done, did not provide any clarity as to what an insignificant contribution might be and did not express any view on whether the Plan would in fact result in any harm. It merely concluded that the method of assessment which led to the adoption of the Lewes / South Downs Joint Core Strategy was wrong.

- 5.2 Wealden District Council have also in recent years been undertaking air quality and ecological studies on the Forest. The results of these studies, discussed below and in the Wealden Judgement have led Wealden DC to conclude that even an additional single vehicle journey across the forest may result in a likely significant effect and therefore a Habitat Regulation Assessment is required for all plans and projects in the area. This view is not shared by any of the adjoining LPAs or Natural England.
- 5.3 It is also clear that Wealden DC's view is not shared by the Secretary of State for Housing Communities and Local Government ('SoSHCLG'). On 1 March 2018, the SoSHCLG determined five appeals in Mid Sussex that involved an assessment in relation to possible effects on Ashdown Forest as a result of additional traffic movements. The conclusions reached in relation to each appeal was the same: the additional vehicle movements generated by the application would not have an adverse impact on the integrity of the SAC. As an example, in the appeal APP/D3830/W/16/3142487 for 200 dwellings at East Grinstead the SoSHCLG accepted Natural England assessment at paragraph 15 that:

“the increased Annual Average Daily Traffic (AADT) expected from this proposal is significantly below the threshold for potential significance and is considered nugatory and indistinguishable from background variations” and “the appeal scheme can be screened out as having no likely significant effect on the Ashdown Forest SAC and SPA, either alone or in combination with other plans or projects, and a full Appropriate Assessment is not required”.

5.4 As set out below, the Council’s air quality consultants have concluded independently of the SoSHCLG’s decisions (and on the basis of a different methodology) that planned growth in TWBC will not have an adverse impact on the SAC. Nonetheless, the SoSHCLG’s recent decisions amount to a rejection of Wealden DC’s position. East Grinstead is marginally closer to Ashdown Forest than Royal Tunbridge Wells and the main road south leads directly across the Forest and was the subject of a written representation by Wealden District Council in January 2018.

6.0 The Objections from Wealden District Council

6.1 Wealden DC, like other Councils, are consulted on applications within Tunbridge Wells Borough that fall close to or on their boundary. Prior to the Wealden Judgement, in October 2016 Wealden DC responded to a consultation on such an application (TW/16/06387 for 9no. new dwellings) and “raised no objections” subject to the Council undertaking an assessment under the Habitat Regulations. As decision maker at that point, the Council were content to rely upon the existing practice note as the letter contained no new evidence in relation to concerns over likely harm to Ashdown Forest and studies being undertaken by Wealden DC were incomplete.

6.2 Post the Wealden Judgement, on 07 August 2017, Wealden DC’s response to a consultation on an application on the same site (TW/17/02173 again for 9no. new dwellings) was an “objection” on the basis that the “proposal would have an adverse effect on the integrity of the SAC” but the letter did not explain the evidence for this. The letter also suggested that TWBC could not

rely upon the existing practice note as it was based on the methodology that the Wealden Judgement had found to be flawed. TWBC met with Wealden DC to discuss the matter but were unable to agree or fully understand their position.

- 6.3 Although some information was available on the Wealden DC web site the final results of the air quality assessment and ecological interpretation being undertaken by Wealden DC were at the time incomplete and were not released to the Council.
- 6.4 Tunbridge Wells Borough Council was unable to agree to Wealden's position without sight and review of the studies and Wealden DC was unwilling to alter its position even as a temporary measure until the reports were finalised and published. TWBC advised Wealden that they were taking their comments into consideration and were obtaining both technical and legal advice on the matters raised and that this would take some time to provide a full response. In the meantime TWBC officers considered it appropriate that the application to which Wealden DC objected would not be determined. At the behest of TWBC work started on a Statement of Common Ground (SoCG) between the two authorities but was postponed until TWBC's own studies could be completed and its position finalised.
- 6.5 The Wealden DC Air Quality report was released in a redacted form in October 2017 and a less redacted version a few weeks later. The ecological interpretation has not yet been released and is the subject of ongoing discussion between Natural England and Wealden DC: parts of which are in the public domain.
- 6.6 Wealden DC's studies conclude that the 'critical load' for nitrogen deposition is exceeded across the protected habitats of the Ashdown Forest SAC. The 'critical load' is a level of deposition below which long-term harmful effects on ecosystem function or structure do not occur according to current knowledge. The fact that the critical load for heathland is currently exceeded is a relevant consideration in assessing the likely effects of any plan or project. However,

the fact that the critical load is currently exceeded does not, on its own, mean that an increase in traffic resulting from consented or planned development will necessarily have a 'likely significant effect' on the SAC or that it would "have an adverse effect on the integrity of the SAC" (the key test in the legislation). The critical load is just one part of the ecological interpretation.

6.7 In January 2018 TWBC received objections from Wealden DC to 7 planning applications including 2 new dwellings in Goudhurst, a redevelopment of 25 affordable units in Cranbrook, 2 new dwellings in Southborough and a single dwelling in Hawkenbury. At or around the same time, similar objections were made in relation to numerous planning applications made to eight other authorities adjoining or close to Wealden District including some who had so far had no contact with Wealden DC on the matter.

6.8 As a result of these letters Wealden DC were asked to issue a statement to explain their position (January 31st 2018 appendix 1) and were called to a meeting by all affected authorities held on 7th February 2017 to answer questions the authorities had. At that meeting Wealden DC made it absolutely clear that their position was that one vehicle, originating from anywhere, crossing or passing close to the Forest could "in combination" have a "likely significant effect" on the SAC and therefore needed assessment under the Habitat Regulations. Wealden DC went further to argue that there was no de minimis threshold, even for single dwellings very distant from the Forest and they reserved the right to pursue through the courts any decision they considered did not comply with the Habitats Regulations. Wealden's representative stated that their view was based on published information (noting that the ecological interpretation had not yet been finalised or published). Wealden DC would not agree when asked to cease issuing objections until the publication of their ecological interpretation but in reality at the time of writing no further letters have been received.

6.9 In an update issued by Wealden DC on its Local Plan web page dated 22 February 2018 it stated that following advice received from Natural England that "*We continue to focus on completing the HRA including the Appropriate*

Assessment as soon as possible to deliver an updated Wealden Local Plan to Council by the end of June”.

- 6.10 The latest written statement from Wealden DC received by TWBC on the 15 March 2018 by email was that Wealden DC were continuing with undertaking an assessment of its Local Plan under the Habitat Regulations and that “*we hope to be in a position to set out WDC’s final position within the next few weeks. Until we have undertaken an appropriate assessment WDC will be maintaining its current stance on development proposals”.*

7.0 The Council’s Response

Statement of Common Ground

- 7.1 In response to the Wealden Judgement, to address cross boundary air quality and HRA issues for Ashdown Forest and to better understand the position of Wealden DC under the Duty to Cooperate TWBC joined with the following authorities in May 2017 to create the Ashdown Forest Working Group (referred to as the Air Quality Group):

Wealden District Council
Sevenoaks District Council
South Downs National Park Authority
East Sussex County Council
Tandridge District Council
Lewes and Eastbourne Councils
Mid Sussex District Council

- 7.2 As discussions have progressed and Wealden DC’s position has become clearer the group has been joined by:

Crawley Borough Council
West Sussex County Council
Rother District Council
Tonbridge and Malling Borough Council

- 7.3 More recent meetings chaired by SDNP have been attended by representatives for Brighton and Hove City Council, Horsham and Hastings Borough Council.
- 7.4 These meetings have had a positive outcome in the sharing of resources and in developing a common approach. In particular, the Air Quality Group has worked towards agreeing a common approach to traffic and air quality modelling and interpretation. For TWBC this has enabled close working with SDNP and Lewes DC through the use of a shared transport modelling methodology and joint commissions for legal and technical advice which is now having benefits for Sevenoaks DC and Tandridge DC who are using the same approach.
- 7.5 An important outcome of the group has been a statement of common ground (SoCG) between the participating authorities setting out areas of agreement and disagreement between the members and to provide clear information on the approach to technical matters by each authority. The process of developing the SoCG was supported by the Planning Advisory Service who chaired the meetings. Although not yet finalised indications are that most authorities are able to agree a common approach and understating of the issues apart from Wealden DC who disagree on the majority of points.
- 7.6 All of these meetings have been supported by representatives from Natural England who have approved the approach by SDNP to HRA matters and offered support for our own approach.

AECOM Air Quality Impact Assessment

- 7.7 Upon receipt of Wealden's objection letter of 7th August 2017 TWBC engaged the services of AECOM who carried out the original HRA works for the Local Plan and advised on the original Practice Note to look into the suggestion by Wealden DC that development in Tunbridge Wells Borough would give rise to an adverse effect on the Forest. The technical approach adopted by AECOM and the outputs of its work have been subject to Counsel's ongoing advice to

ensure that TWBC is interpreting and applying the Habitat Regulations correctly and to minimise the risk of legal challenge.

- 7.8 Rather than modelling the effect of individual planning applications, AECOM advised that the more appropriate approach is to consider the effect of an individual application in the context of the 'in combination' effect of planned growth in all authorities around Ashdown Forest over an extended period. This is because long-term trends in air quality for vegetation are more important than short-term fluctuations. The ecological effects of nitrogen deposition are associated with persistent long-term exposure over many years. A modelling exercise was therefore undertaken to assess the impact of growth in the region as a whole over an extended period. Individual applications can then be considered in the context of the effects of wider planned growth.
- 7.9 To assess properly the effects of planned growth on the SAC, it was necessary first to develop a model to predict how much traffic will travel across or close to the Forest and then to calculate the emissions that will result. Those emissions were then considered in the context of any background improvements in air quality and the resulting change in nitrogen deposition rates on the protected heathland. AECOM then conducted ecological interpretation of the results to understand whether the predicted impact on nitrogen deposition rates resulting from planned growth in the region would have an effect on the habitats present in the SAC and, if so, whether that effect was of significance or not.
- 7.10 The AECOM model adopted a precautionary approach. One element of that precautionary approach was to assume that all local authorities in the region (including TWBC) that are currently at the plan-making stage will deliver housing to meet their full objectively assessed housing need to 2033.
- 7.11 The final output of AECOM's work is the Tunbridge Wells Borough: Ashdown Forest Air Quality Impact Assessment 2018. That document is the result of an iterative process which has taken into account the following:

- Ongoing legal advice from counsel
- Correspondence and discussion with Wealden DC
- Letters of Objection from Wealden DC to Tunbridge Wells BC planning applications
- Letters of Objection from Wealden DC to SDNP Local Plan HRA
- Statements from Wealden DC
- Published reports by Wealden District Council, including the technical air quality work produced by Air Quality Consultants
- Comments from Natural England
- The outcomes of meetings of the Air Quality Group
- The findings of recent Court cases

7.13 The Air Quality Impact Assessment concluded at 4.1.4 as follows:

“It is therefore concluded that no adverse effect upon the integrity of Ashdown Forest SAC is expected to result from development provided by the Tunbridge Wells Local Plan, even in combination with other plans and projects. This is due to a combination of a) an expected net improvement in air quality over the Local Plan period, b) the fact that, whether or not that improvement occurs to the extent forecast, the contribution of the Tunbridge Wells Local Plan to changes in roadside air quality is demonstrably ecologically negligible due to the very small magnitude and c) the precautionary nature of the modelling”.

7.14 AECOM has advised that, notwithstanding Wealden DC's position, there is no reasonable scientific doubt about its conclusion that the proposed growth in TWBC will have no adverse effect on the integrity of the Ashdown Forest SAC, either alone or in combination with other plans and projects.

7.15 That conclusion is relevant to the discharge of TWBC's functions as competent authority under the Habitats Regulations. The Practice Note 2018: Concerning HRA of planning applications explains how the results of the Air

Quality Impact Assessment 2018 are to be reflected in TWBC's approach to screening planning applications for compliance with the Habitats Regulations.

7.15 Both the Air Quality Impact Assessment and the Practice Note are to be presented to Full Council with a recommendation that the Practice Note be adopted.

7.16 Natural England has been formally consulted on the Tunbridge Wells Borough: Ashdown Forest Air Quality Impact Assessment 2018 and new Practice Note. This has been arranged through the Discretionary Advice Service to expedite matters. They have concluded that the reports are acceptable and that modelled development within Tunbridge Wells Borough will not have an adverse effect on Ashdown Forest:

"In general both the Air Quality Impact Assessment and the HRA Practice Note are concise, well-reasoned and well referenced and I can confirm that the approaches taken are acceptable.

I concur with the conclusions reached within the Air Quality Impact Assessment that the Tunbridge Wells Borough Council Local Plan will not have an adverse effect on the integrity of Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA).

I support the approach taken in the HRA Practice note and consider that development coming forward that falls within the framework of the overarching AQ modelling will not have an adverse effect on the integrity of Ashdown Forest SAC or SPA".

7.17 Two minor points of clarification were requested by Natural England and these have been addressed in the versions of the attached reports. The Natural England response dated 27 March 2018 is attached as Appendix 2.

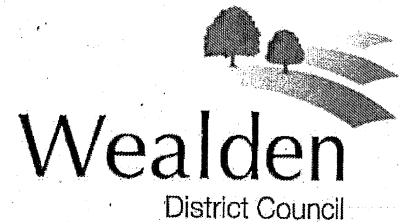
8.0 Next Steps

- 8.2 Officers from TWBC will meet with representatives of Wealden DC to share the Air Quality report and Practice Note to seek any comments they may have. Those comments will be reported to Cabinet/Full Council as and when available.
- 8.3 Officers from TWBC will continue to work with Wealden DC and other affected authorities through the forums established for both **Air Quality** and **Visitors** with a view to coming to a common understanding and approach wherever possible. Where areas of disagreement persist TWBC has suggested independent review and collaborative commissioning of studies to avoid resort to formal objections or legal resolution. The Council will continue to be open to such solutions and offer to collaborate in future studies to minimise and share the financial and resource burden of these areas of work.
- 8.4 Officers will continue to advise Members on the Ashdown Forest issue as matters unfold.

Appendix 1

Statement from Wealden District Council 31st January 2018

OUR REF: NH/KE
DATE: 31st January 2018
YOUR
REF:



Members of the Ashdown Forest
Local Authorities Group plus
Horsham, Crawley and Brighton
and Hove Councils

Director of Planning Policy & Economic
Development

Letter sent by email

Dear Colleague

Statement for the Ashdown Forest Local Authorities Group

Following the meeting of the Ashdown Forest Local Authorities Group on 18 January 2018 where a statement was requested from Wealden District Council in relation to the letters of objection which had been sent, please find this statement attached.

As set out in the statement Wealden District Council will continue to seek to work with other authorities, Natural England and other organisations to find solutions to bring forward development whilst protecting our legal position including our obligations and duty to protect the Ashdown Forest. The Council will look to other local authorities to actively work with us to progress potential solutions within legislative requirements.

To this end I look forward to discussing how we might address and progress these issues with those of you who are attending the meeting scheduled for 7th February 2018.

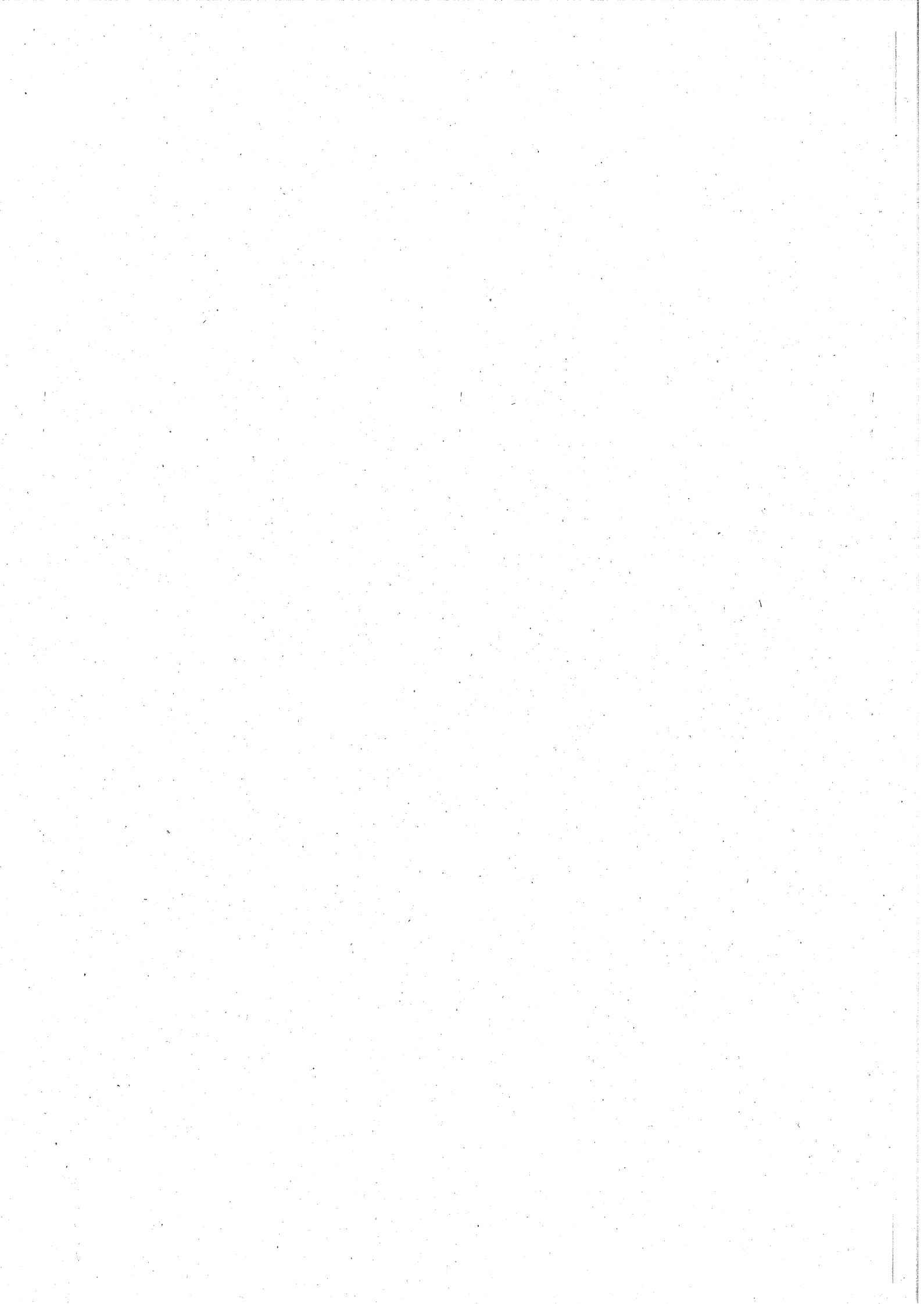
Yours sincerely

Nigel Hannam
Director Planning Policy & Economic Development



Wealden District Council, Vicarage Lane, Hailsham,
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East Sussex, BN27 2AX



Statement from Wealden District Council for the Ashdown Forest Local Authorities Group

Background

- 1) Wealden District Council (WDC) was required to investigate further the impacts of nitrogen deposition on Ashdown Forest SAC "so that its effects on development in the longer term can be more fully understood and mitigated if appropriate" as a result of the modification of a policy recommended by the Planning Inspector to the Wealden Core Strategy in 2013.
- 2) The Core Strategy was subject to a legal challenge from a partnership seeking more growth within the District. In this regard the grounds for challenge were not upheld and Wealden District progressed with its policy of protecting the Ashdown Forest from the impacts from development.
- 3) WDC set up a monitoring regime on Ashdown Forest SAC some four years ago. Results of these monitoring and modelling future growth assumptions have been placed in the public domain including a briefing document for the Ashdown Forest Nitrogen position on 13 March 2017 and the publication of the Air Quality report for the Ashdown Forest on 3 November 2017 with an accompanying briefing note.
- 4) WDC's position has been based on advice from Natural England that the Core Strategy alone contributes less than 1000 AADT to roads crossing Ashdown Forest and any addition to this results in the 1000 AADT threshold being exceeded. This threshold exceedance is considered to result in a likely significant effect and an appropriate assessment is required.
- 5) In 2016 Wealden District Council (WDC) objected to Lewes District Joint Core Strategy (joint between Lewes District and the South Downs National Park Authority SDNPA) as it had not undertaken an in combination assessment. The judgement (delivered March 2017) concluded that with the evidence at that time from the Lewes District Joint Core Strategy and Wealden District Core Strategy that an appropriate assessment was required (as it exceeded the 1000 AADT threshold). However the legal challenge was out of time for Lewes but in time for the development within South Downs National Park. The Wealden District Core Strategy and the Lewes District Core Strategy exceeded the 1000 AADT threshold.
- 6) In February 2017 Wealden District Council published information on nitrogen deposition on Ashdown Forest resulting from commitments and completions at Wealden District and proposed development contained within the emerging Wealden Local Plan. The information also showed that 1000 AADT did not equate to a 1% process contribution, a threshold that Natural England also uses in its consideration of a likely significant effect. Based on the information published WDC considers that there is a likely significant effect. Work is currently being completed in relation to Wealden's Habitats Regulations Assessment (HRA), including input commissioned from Natural England which will provide further information with regards to site integrity.
- 7) In considering the evidence and applying legislation Wealden District Council considers its decisions are lawful, taking into account case law.

- 8) Subsequent to the High Court in combination judgement SDNPA set up a working group of Local Authorities regarding the Ashdown Forest SAC. A statement of common ground (SoCG) is being finalised between these authorities as evidence for the SDNPA local plan and wider use by the Local Authorities involved. This group includes:
 - Wealden District Council, SDNPA, Lewes District Council, Eastbourne Borough Council, Rother District Council, Tunbridge Wells Borough Council, Mid Sussex District Council, Tandridge District Council, Sevenoaks District Council.
- 9) Work published for the SDNPA Local Plan (HRA of the SDNPA Local Plan) states that no adverse effect upon the integrity of Ashdown Forest SAC is expected to result from development provided by the South Downs Local Plan and Lewes Joint Core Strategy, even in combination with other plans and projects. Wealden District Council has submitted representations, consistent with its position, explaining what it believes are significant deficiencies in the SDNPA HRA. The SDNPA Plan has yet to be examined. In addition WDC has submitted responses in relation to the Mid Sussex Local Plan and the Lewes Local Plan, consistent with WDC's position
- 10) The way in which different local authorities are approaching the method of determining impacts and interpretation of legislation in relation to European sites is contained in the SoCG.
- 11) WDC has actively participated and supported this group and the work it is undertaking.
- 12) Since the potential for a likely significant effect across the District on the Ashdown Forest SAC became clear WDC has only allowed planning applications to go forward within the District which can be proved not to result in additional traffic movements across the Ashdown Forest. For this to take place a screening under the Habitats Regulations is undertaken to determine whether there is a likely significant effect from development. In practice this means it is primarily brownfield sites which have vehicle movements already associated with them which are allowed to proceed. Applications which will result in additional traffic movements are being held and applicants have been asked to agree to extensions to the determination timescale.
- 13) During the second half of 2017 WDC became aware that Tunbridge Wells Borough Council (TWBC) were assessing planning applications which were close to the Ashdown Forest and, in WDC's view, would result in additional traffic movements across Ashdown Forest. Given the in combination judgement earlier in 2017 which had made it clear that any additional traffic movements across Ashdown Forest should trigger an appropriate assessment, WDC raised this with TWBC.
- 14) The subsequent discussions led to TWBC requesting a statement of common ground between the two councils to set out clearly the different positions. The initial TWBC draft of this was revised by WDC in October 2017. This revision clearly set out the WDC view that, based on legal advice, TWBC could not rely on their extant HRA and needed to take account of the High Court judgement and latest monitoring information. The TWBC / WDC SoCG remains outstanding.
- 15) As a result WDC flagged with TWBC that WDC's position was that an appropriate assessment was required and that WDC may object to

- applications if this did not take place. As an in combination assessment did not take place WDC submitted objections to TWBC planning applications.
- 16) Subsequently, in order to protect WDC's position in relation to the Ashdown Forest and on the non-determination of WDC planning applications, the Council sent out letters to a number of authorities setting out its view that an assessment under the Habitats Regulations should be undertaken on specific planning applications where proposed developments might, alone and in combination with other plans and projects, lead to increased vehicle movements over the designated European sites and flagging that WDC would object to the application if this was not done. In those cases where LPAs have published a Habitats Regulations Assessment linked to an emerging Plan that is subject of outstanding objections and has not yet been declared sound by an Inspector, it was pointed out that determination of planning applications based on the emerging Assessments(s) would be flawed.
- 17) To clarify, a Habitats Regulations Assessment comprises a number of stages the first is commonly referred to as screening (consideration of likely significant effects) the second stage is called appropriate assessment.

Statement

- 18) Whilst the issue of the protection of the Ashdown Forest has been widely known to neighbour authorities' planning staff for some time, WDC recognises that the manner of submitting the letters of objection on planning applications to other Local Authorities without contacting senior officers may have appeared to be unhelpful. WDC apologises for that.
- 19) However, the letters do deal with the protection of the Ashdown Forest which is a live issue for all the neighbouring authorities, and all authorities have a duty to co-operate. WDC will continue to work with neighbouring authorities directly and through the Ashdown Forest Local Authority Group and promote the sharing of information wherever possible.
- 20) Pending the production of this statement WDC has paused sending any more letters outlining the need for a screening/Appropriate Assessment under the Habitats Regulations. However, WDC does need to maintain a consistent approach and therefore, in order to safeguard our position, WDC will continue to object to further development proposals which it believes could impact on the Ashdown Forest. To facilitate improved working relationships any future objection letters will be preceded by either an email or telephone conversation.
- 21) In sending the letters the Council has applied the following criteria which is in line with and consistent with the criteria it has applied to WDC planning applications:
- new sites on greenfield;
 - brownfield where there is a clear increase in use;
 - new residential developments; and
 - employment and commercial uses including a material increase in floor area.

There were no letters sent in relation to reserved matters.

- 22) It should be noted that the Council is mainly objecting in the event that the competent authority does not carry out a screening and, if required, an appropriate assessment, for relevant applications. However, there are

circumstances where the Council is objecting to Habitats Regulations Assessments, associated with planning applications that are considered deficient. Wealden District Council has made representations to Mid Sussex District Council, South Downs National Park and Lewes District Council with regards to their Habitats Regulations Assessments as part of the Local Plan process.

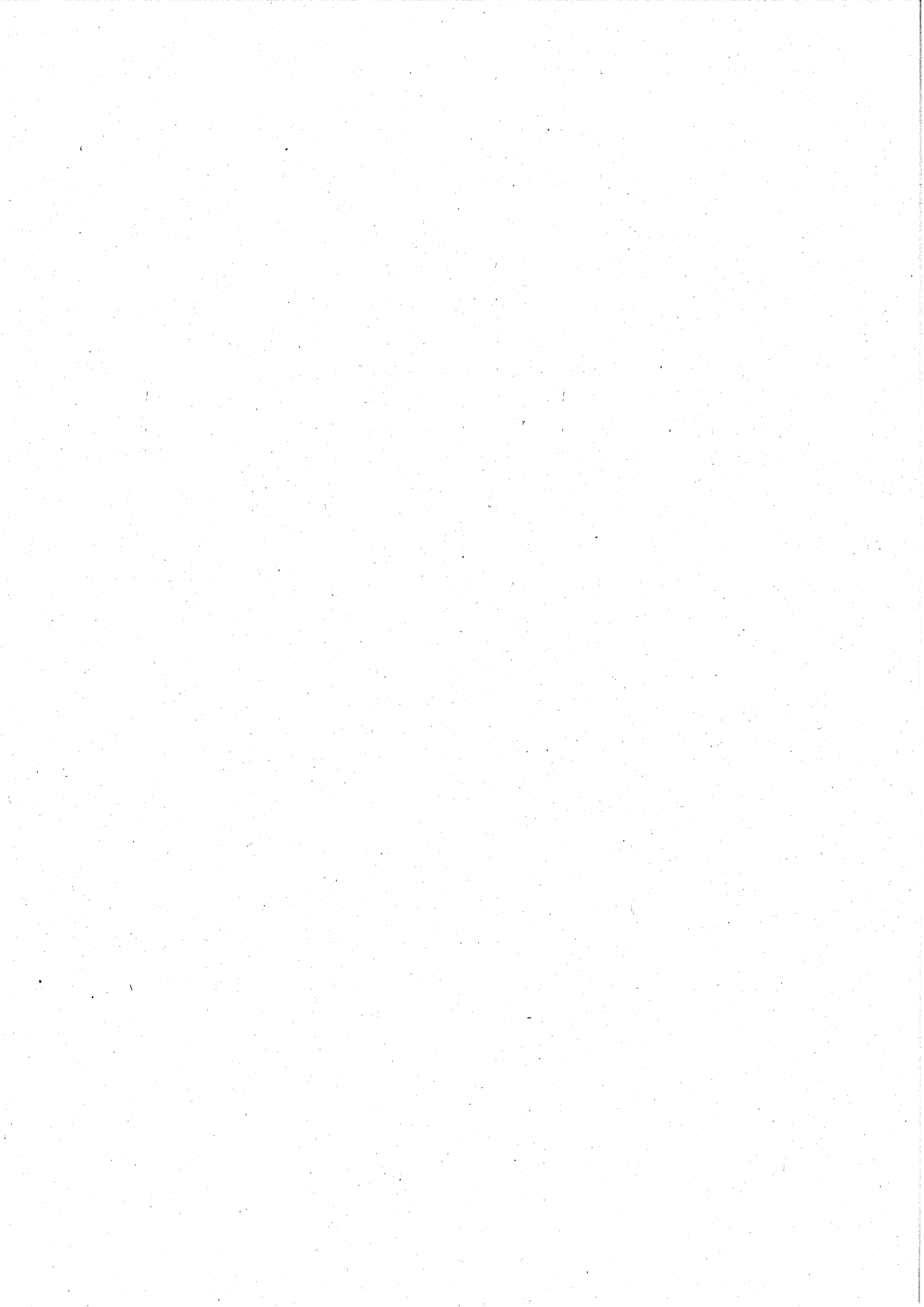
- 23) The Council will continue to seek to work with other authorities, Natural England and other organisations to find solutions to bring forward development whilst protecting our legal position including our obligations and duty to protect the Forest. The Council will look to other local authorities to actively work with us to progress potential solutions within legislative requirements.
- 24) WDC's position in relation to plans remains as set out above and in the Ashdown Forest Local Authority SoCG. The Council will consider the Plan and HRA in question at the Regulation 19 stage, and make representations as appropriate. If required an officer will attend the EiP (being mindful of the feedback made during the Joint Lewes District Core Strategy legal challenge) to make verbal representations. When the Inspector's report is received it will be considered in the light of the representations made, and depending on the content will be passed to a legal representative. Advice will be taken at this time as to whether it is within the interest of Wealden District and its Local Plan to proceed with a legal challenge. To help maintain partnership working, every effort will be made to contact relevant officers at the various stages. WDC would also comply, where appropriate, with the requirements of the formal Pre-action Protocol procedure prior to issuing any legal challenge.
- 25) Similarly WDC will take a view on whether to challenge any individual planning application approval, based on a number of factors including the risk of that planning application approval undermining WDC's position. The Council would raise any concerns with the relevant authority before taking any action.

Conclusion

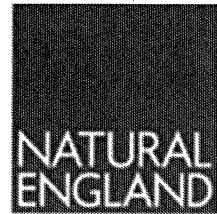
- 26) WDC has been working with neighbouring authorities ensuring that they are aware of the evidence and the WDC position in relation to the Ashdown Forest SAC for some time. WDC would point to this, their involvement and commitment to the Ashdown Forest Local Authorities Group and support to the SoCG work, and their willingness to initiate a meeting with the relevant authorities to seek to resolve these issues, as indications of a positive desire to continue constructive partnership working.
- 27) WDC hope that this statement and the subsequent meeting will ensure that neighbouring Councils understand and appreciate WDC's position. WDC needs to undertake its duty to protect the Ashdown Forest SAC and SPA diligently and believes that, whilst the geography is that these areas are located solely within Wealden, the responsibility for ensuring the Forest is protected falls much wider.

Appendix 2

Natural England Response to Consultation 26 March 2018



Date: 27 March 2018
Our ref: DAS/12981/236883 Rev A



David Scully
Tunbridge Wells Borough Council

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

BY EMAIL ONLY

Dear David

**Discretionary Advice Service (Charged Advice) DAS 12981/236883
Advice on HRA work in relation to the existing and emerging Local Plan**

Thank you for your consultation on the above dated 22 January 2018, which was received on the same date.

This advice is being provided as part of Natural England's Discretionary Advice Service. Tunbridge Wells Borough Council has asked Natural England to provide advice upon:

- Advice on HRA work in relation to an existing and emerging Local Plan

This advice is provided in accordance with the Quotation and Agreement dated 25 January 2018.

The following advice is based upon the information within

- Tunbridge Wells Local Plan: Air Quality Impact Assessment Rev 3 (AECOM March 2018)
- HRA Practice Note: Approach to determining planning applications in Tunbridge Wells Borough (AECOM March 2018)

Summary:

In general both the Air Quality Impact Assessment and the HRA Practice Note are concise, well-reasoned and well referenced and I can confirm that the approaches taken are acceptable.

I concur with the conclusions reached within the Air Quality Impact Assessment that the Tunbridge Wells Borough Council Local Plan will not have an adverse effect on the integrity of Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA).

I support the approach taken in the HRA Practice note and consider that development coming forward that falls within the framework of the overarching AQ modelling will not have an adverse effect on the integrity of Ashdown Forest SAC or SPA.

Further detailed comments are included within the attached Annex

For clarification of any points in this letter, please contact me on 0208 026 8007.

This letter concludes Natural England's Advice within the Quotation and Agreement dated 25 January 2018.

The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

Marian Ashdown
Senior Adviser
Sussex and Kent Team
Marian.ashdown@naturalengland.org.uk

Annex

Ashdown Forest Air Quality Impact Assessment

In general the report is concise, well-reasoned and well referenced. I can confirm that the approach taken is acceptable and I concur with the conclusions reached within the report that the Tunbridge Wells Borough Council Local Plan will not have an adverse effect on the integrity of Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA).

I note that the traffic links that have been modelled represent the busiest areas through Ashdown Forest and therefore represent the areas where the highest potential impacts would occur. This approach is supported.

The base scenario, no nothing and do something scenarios have been used in the forecasting which is an appropriate approach and is most often used within air quality modelling.

It is noted that Local Plans have varying end dates and this has been accounted for in the modelling by using TEMPro and future forecasting. A precautionary approach has been undertaken which takes the highest figure of growth in surrounding authorities by using the most recently derived OAN to adjust growth upwards. The report provides clear reasoning for the growth figures used for surrounding authorities. This is considered to provide a robust worst case scenario with regard to expected growth for the "in combination" assessment.

A bespoke model has been used to manually assign trips based on journey to work data which is expected to provide a realistic interpretation of traffic movements based on broad distributions of expected housing coming forward.

The do something scenario is considered to be the impacts of the Sevenoaks, LDC, SDNPA and TWBC local plans as these have all been subject to the bespoke traffic assignment approach. However, TWBC's individual contribution has also been considered separately within the assessment. The do nothing scenario is the background growth expected from other authorities but without the contribution of the LPAs mentioned above.

The NO_x and Nitrogen deposition has been assessed using the DMRB model which is an accepted model to use. I welcome that ammonia has now been modelled for completeness and note that there is not a standard model for ammonia emissions however a bespoke model has been used. The methodology for this is considered appropriate.

It is appropriate to use expected improvements in background air quality when considering air quality impacts. Where an existing national, regional or local initiative can be relied upon to lead to the reduction in background levels of pollution at a site, the competent authority should assess the implications of a plan or project against an improving background trend. I note that a more precautionary approach has been taken than that advised within DMRB to assume a year on year improvement of 2% and the method derived has been explained well in the report.

Table 1 clearly demonstrates the comparison of the do something scenario against the do nothing scenario with regard to traffic flows and Table 2 shows the percentage contribution of the TWBC local plan alone against the relevant links.

I note the reasoning for the decision to use the higher critical level of 3 µg/m³ for ammonia. However it is wise to consider the precautionary view that some areas where there is a lack of lower plant interest due to a higher sward may be subject to management in the future leading to a higher potential for lower plants to colonise. I therefore welcome the addition of consideration of the lower critical level of 1 µg/m³

The assessment correctly assessed the impacts from traffic related air quality on heathland habitats only. I note that deposition values relevant to heathland have been used and concur that woodland habitat is not relevant to the assessment as this is not an SAC feature. Ashdown Forest comprises a mosaic of habitats and woodland forms a part of that and is a SSSI feature.

The results of the air quality modelling identify that notwithstanding any impacts from Local Plans, there will still be a net improvement to current air quality resulting from technological improvements. The report goes on to assess the ecological relevance of this and has regard to the retarding of expected background improvements based on impacts from the TWBC local plan alone and in combination with other plans and projects. This section provides evidence by drawing on research that has been published within the NECR210 report (referenced as Caporn et al 2016) to identify that the increase of nitrogen deposition from the relevant road links considered against the existing background would not result in a loss of species richness. Additionally the report also appropriately discusses other edge effects from roads such as salt spray, run off etc that are likely to hinder the ability of areas very close to existing roads to support ideal habitat.

Section 4 provides a summary of the findings to conclude that Tunbridge Wells Borough Council's Local Plan alone and in combination with other plans or projects will not have an adverse effect on the integrity of Ashdown Forest Special Area of Conservation (SAC) or Special Protection Area (SPA). I concur with the conclusion reached.

I welcome the reference to partnership working to consider approaches to reducing the existing background air quality levels and look forward to working with relevant parties.

HRA Practice Note

The practice note summarises the results of the air quality modelling to provide a good framework for the approach to be taken for individual planning applications.

There does appear to be an error with one of the references on page 4 of the report. The first sentence of para 3.9 mentions ammonia concentrations but reference 5 which applies to this sentence provides more information on the greatest areas of nitrogen deposition. It is unclear whether the reference should be referring to ammonia concentration or whether the reference point has been entered into the wrong area of text.

I fully support the approach noted in para 3.11 onwards. As the overarching modelling has been undertaken with a conclusion of no adverse effect on the integrity of Ashdown Forest then development that falls within the parameters noted in para 3.12 can be considered to have been assessed under the Habitats Regulations. The practice note refers to very large developments that may change the distribution of housing growth and suggests that these should be assessed on a case by case basis; this is considered to be appropriate.

Paras 3.13 and 3.14 discuss the contribution of very small developments coming forward and provides a clear explanation as to why TWBC consider that additions of less than 10 AADT would not materially change the air quality modelling. However it is not clear from this section as to whether these small developments will still be considered as part of the numbers for the total growth (10,368) or considered as having no effect alone without reference to the overarching modelling so clarity here is recommended.

Practice Note 2018
Ashdown Forest:
Screening of planning applications for compliance with the
Habitats Regulations

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1. Introduction

- 1.1 This Practice Note is intended to guide Tunbridge Wells Borough Council ('the Council') in the discharge of its functions under the Conservation of Habitats and Species Regulations 2017 when considering whether to grant planning permission for a development that might affect the Ashdown Forest Special Protection Area (SPA) and/or Special Area of Conservation (SAC). It is not planning policy and does not override the Council's legal duties; however, decision makers will follow the approach set out in this Practice Note unless the individual circumstances of an application and/or the Council's legal duties require an alternative approach.
- 1.2 Ashdown Forest is an extensive area of common land lying between East Grinstead and Crowborough. It is one of the largest single continuous blocks of heath, semi-natural woodland and valley bog in south-east England, and it supports several uncommon plants, a rich invertebrate fauna, and important populations of heath and woodland birds. It is both an SPA and an SAC.
- 1.3 The SPA is designated for its populations of breeding Dartford Warbler *Sylvia undata* and Nightjar *Caprimulgus europaeus*. The SAC is designated for its Annex I habitats, namely Northern Atlantic wet heaths with *Erica tetralix* and European dry heaths; as well as for its Annex II species, namely Great Crested Newts.
- 1.4 Although the SPA/SAC lies entirely within Wealden District, it is capable of being affected by development consented by the Council. The SPA can be affected by recreational pressure arising from population growth in that part of Tunbridge Wells Borough closest to the SPA. The SAC can be affected by an increase in emissions from vehicles using roads (including the A26 and A275) that run through and adjacent to it. As a result, the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations') require the Council, as competent authority, to consider – upon receipt of a planning application – whether it can exclude the possibility that the proposed development could have likely significant effects on the SPA/SAC. If that possibility cannot be excluded at the so-called 'screening' stage, an appropriate assessment of effects is required.
- 1.5 In May 2013, the Council adopted a Practice Note to guide the discharge of its obligations as competent authority when considering the effects of individual planning applications on the Ashdown Forest SAC and SPA. Since that practice note was prepared, a further visitor survey was undertaken for Ashdown Forest (in 2016), a judicial review of relevance to decision-making over 'in combination' assessment has been undertaken and (in light of that judicial review) the Council has commissioned strategic traffic and air quality modelling for Ashdown Forest SAC and SPA. In light of those developments, the Council has considered whether it is necessary to revise its practice and has concluded:
 - In relation to planning applications that may add to recreational pressure on the SPA, the Council will – until further notice - continue to apply the pre-existing approach explained in more detail below;
 - In relation to planning applications that may generate additional vehicle movements through or adjacent to the Ashdown Forest SAC, the Council will adopt a new approach as set out below.
- 1.6 This Practice Note supersedes the 2013 Practice Note and explains in detail how the Council will consider applications at the screening stage of assessment for compliance with the Habitats Regulations.

2. Recreational pressure

Introduction

- 2.1 Tunbridge Wells Borough is 4.6km from the SAC/SPA boundary at its closest. In 2010 a visitor survey of Ashdown Forest SAC/SPA was undertaken¹. This survey fed into Habitats Regulations Assessment ('HRA') reports of strategic documents at the time. These essentially identified a strategy broadly analogous to that devised for the Thames Basin Heaths; namely the identification of a series of zones around the SAC/SPA each of which triggered a combination of provision of alternative greenspace and improved access management. At that time, a 7 km 'outer zone' for Ashdown Forest SAC/SPA was agreed with Natural England². Authorities that granted consent for development within the 7 km 'zone' were required to provide a financial contribution to Suitable Alternative Natural Greenspaces (SANGs), and/or an access strategy (SAMM) for Ashdown Forest as well as a programme of monitoring and research. This approach was supported by Natural England and the Ashdown Forest Conservators.
- 2.2 In 2016 Footprint Ecology updated the visitor survey³ on behalf of the participating Councils. The survey was updated to provide comprehensive and up-to-date data on recreational use of Ashdown Forest to inform the strategic implementation of access management measures and the direction of strategic access management and monitoring; to assist in the design and ongoing management of SANGs to ensure they functionally divert recreational pressure from Ashdown Forest; and to assist local authorities in discharging their planning functions under the Habitats Regulations. That updated survey has resulted in a review of the zones agreed in 2011, although the 7km zone is still recognised as a core zone for delivering mitigation.
- 2.3 At the time of writing the implications of the visitor survey data for Tunbridge Wells Borough are under review. Therefore, for the time being the Council will continue to apply the existing approach agreed with Natural England, namely:
- i. Where proposed development would lead to a net increase in housing within 7km of the Ashdown Forest SAC, financial contributions will be sought to the SAMM strategy to mitigate the effects of increased recreational pressure on the SAC;
 - ii. In the event that no financial contributions to the SAMM strategy are offered, applicants will be required to provide sufficient information to allow the Council, as competent authority, to carry out an appropriate assessment of the effects of the proposed development on the integrity of the SAC.
 - iii. Beyond the 7km zone, SAMM contributions and/or appropriate assessment will not generally be required but may be sought where justified on a case-by-case basis.

¹ 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

² UE Associates. October 2011. Habitat Regulations Assessment for the Mid-Sussex District Plan

³ Liley, D., Panter, C. & Blake, D. (2016). Ashdown Forest Visitor Survey 2016. Footprint Ecology Unpublished report.

3. Air quality

Introduction

- 3.1 The protected heathland in the Ashdown Forest SAC can be harmed by exhaust emissions from vehicles on roads which pass through and adjacent to the Forest. It is clear that planning permissions for development in Tunbridge Wells Borough can lead to additional vehicle movements on those key roads, thereby increasing exhaust emissions.
- 3.2 Of most concern are oxides of nitrogen (NOx) which can lead to a harmful increase of nitrogen deposition on the protected heathland. Evidence from Wealden District Council suggests that the current level of nitrogen deposition is already above the 'critical load' and may already be having a negative effect on the SAC. One approach is therefore to conclude that likely significant effects on the SAC cannot be excluded where a planning application might lead to any additional vehicle movements through or adjacent to the SAC. However, the Council has been advised by its air quality consultants, AECOM, that that approach is not sound.
- 3.3 Instead, the more appropriate approach is to consider the effect of an individual application in the context of the 'in combination' effect of planned growth in all authorities around Ashdown Forest over an extended period. This is because long-term trends in air quality for vegetation are more important than short-term fluctuations. The ecological effects of nitrogen deposition are associated with persistent long-term exposure over many years. A modelling exercise was therefore undertaken to assess the air quality impacts of growth in the region as a whole over an extended period.
- 3.4 Appendix A presents the modelling undertaken for the Council by AECOM considering the air quality effects of growth in Tunbridge Wells Borough on Ashdown Forest SAC and SPA until 2033. The traffic/air quality modelling considered the 'in combination' effect of growth in Lewes District, South Downs National Park, Tunbridge Wells Borough, Sevenoaks District, Wealden District, Mid-Sussex District, Tandridge District and authorities further afield. Growth in most authorities was included using the standard National Trip End Model Presentation Programme (TEMPro), adjusted as necessary to reflect expected housing growth rates to 2033. Growth in South Downs National Park, Lewes District, Sevenoaks District and Tunbridge Wells Borough was modelled using a bespoke AECOM model that manually assigned trips to the network. The outputs of these two models were then combined.
- 3.5 At the time of the AECOM modelling, the Council was at an early stage of plan development and therefore did not have definitive site allocations to 2033. However, AECOM's assumptions as to growth in Tunbridge Wells Borough were based on the Council's Objectively Assessed Need together with guidance provided to it by the Council on an appropriate broad distribution of development across the Borough, including existing permissions. The borough was then broken down into a number of sectors for traffic modelling purposes.
- 3.6 The model included the following growth in Tunbridge Wells Borough from 2017 to 2033:
- An average of 790 dwellings per annum (13,430 dwellings total). This included delivery of existing uncompleted planning permissions, windfall and new applications/allocations. It took account of the Government's recently published standardised method for calculating Objectively Assessed Need and included a possible 5,500 dwelling new settlement along the A21 northeast of Royal Tunbridge Wells⁴;
 - A total of 3,584 additional jobs; and
 - Planning application 17/02262/FULL, which was included at the specific request of the Council as it involved development other than conventional housing and employment.

⁴ This settlement and its location are not definitive since the plan is at an early stage of development. However, it was modelled as a worst-case since placing the new settlement further to the east of the borough would likely much reduce journey to work flows on the A26 through Ashdown Forest compared to that included in the AECOM model.

- 3.7 Growth delivered in Tunbridge Wells Borough and other authorities prior to 2017 was also allowed for in the modelling by virtue of the base flows for each relevant road, since completions/occupations can be considered to already be contributing trips to the network.
- 3.8 In summary, the assessment concluded that even on the roads where the 'in combination' increase in flows was expected to be greatest, there was forecast to be a net improvement in NO_x concentrations, nitrogen deposition rates and acid deposition rates by 2033, notwithstanding the 'in combination' increase in flows deriving from Lewes District, South Downs National Park, Tunbridge Wells Borough, Sevenoaks District, Wealden District, Mid-Sussex District, Tandridge District and authorities further afield. Calculations were also undertaken for intervening years between 2017 and 2033 in order to assess whether NO_x emissions in any given year would increase for any period before a decrease was observed. The modelling indicated that emission rates are projected to fall year on year for each link included in the AECOM modelling approach despite the growth in traffic projected. The interim year emissions calculations demonstrate that there are no points where the increase in traffic due to growth or the local plan offsets the improvements in emission rates over time (using conservative assumptions on improvements in emission rates). The assessment also concludes that, while the in-combination effect of planned growth in the region is likely to retard the improvement in background nitrogen deposition rates, that retardation will not be ecologically significant and will not affect the improvement of species richness at the most affected area of heathland⁵.
- 3.9 The AECOM analysis also concludes that ammonia concentrations at the closest areas of heathland to affected roads relevant to Tunbridge Wells (5m from the A275) are modelled to be below the relevant critical levels for protection of vegetation⁶.
- 3.10 For the reasons set out in the document at Appendix A, the approach adopted in the AECOM model was precautionary and provides the Council with a high degree of confidence that it can rely on the results. Since a) air quality in 2033 is forecast to be significantly better than in 2017 notwithstanding the precautionary assumptions made about both growth and improvements in vehicle emissions factors, b) no significant in combination retardation of vegetation improvement at the closest and most affected areas of heathland is expected and c) the contribution of Tunbridge Wells Local Plan to the 'in combination' scenario for those nearest areas of heathland is negligible, the modelling does not provide any basis to conclude that there will be an adverse effect on the integrity of the Ashdown Forest SAC or SPA as a result of planned growth in Tunbridge Wells Borough to 2033. Since no net adverse effect on integrity is forecast, no mitigation is required.

Processing individual applications

- 3.11 The air quality analysis in Appendix A will be relied upon when evaluating live and future planning applications for development in Tunbridge Wells Borough.
- 3.12 Unless the specific circumstances of an application require further consideration by way of an appropriate assessment, likely significant effects on the Ashdown Forest SAC will be excluded for residential and/or conventional employment development at the screening stage of assessment, provided:
- The sum total of development consented and completed in Tunbridge Wells Borough between the adoption of this Practice Note and 2033 (including outstanding permissions that are not already contributing traffic to the network) is not expected significantly to exceed 10,368 new dwellings or 3,584 additional jobs⁷;

⁵ The area of SAC that will experience the greatest nitrogen deposition due to forecast traffic flows is adjacent to the A26 at Poundgate but the nearest area of heathland is 40m from the road at this point, with the intervening habitat being woodland. Woodland is a feature of the SSSI but not the SAC or SPA. In the event that there a desire did emerge to establish heathland at this location in place of the woodland, the forecast deposition rates would not prevent the establishment of this habitat and deposition rates are still forecast to be lower in 2033 than is the case in 2017.

⁶ Considered to be 3 µm⁻³ given the absence of terricolous lichens in this location, although the model forecasts them to also be below the lower critical level for protection of lichens (1 µm⁻³) by 5m from the roadside

⁷ These were the growth assumptions for Tunbridge Wells Borough in the AECOM model.

- Cumulatively, the distribution of all development consented in Tunbridge Wells Borough between the adoption of this Practice Note and 2033 is not significantly different from the distribution assumed in the AECOM model; and
 - Delivery rates of housing and employment growth in Tunbridge Wells Borough have remained generally in line with, or below, those assumed in the AECOM model; i.e. there has not been an unexpected front-loading or anomalous peak of delivery of planned development.
- 3.13 The AECOM model modelled planned residential and conventional employment only. Accordingly applications that involve other types of development beyond residential and conventional employment would always need to be evaluated on a case-by-case basis⁸ as any vehicle movements generated would be additional to that modelled by AECOM. The scale of any such development (and thus the number of vehicles likely to be added to the network) would be a material consideration in that case-by-case evaluation. Without intending to lay down a fixed criteria, a development that was sufficiently small that it would make a change in flows through or adjacent to Ashdown Forest SAC of less than 10 AADT is unlikely to materially alter the air quality data reported in Appendix A, based on sensitivity testing of the model undertaken by AECOM. This for two reasons:
- Firstly, daily traffic flows are not fixed numerals but fluctuate from day to day. The AADT for a given road is an annual average (specifically, the total volume of traffic for a year, divided by 365 days). It is this average number that is used in air quality modelling, but the 'true' flows on a given day will vary around this average figure. Small changes in average flow will lie well within the normal variation (known as the standard deviation or variance) and would not make a statistically significant difference in the total AADT.
 - Secondly, when converted into NO_x concentrations, ammonia concentrations or nitrogen deposition rates, such small changes in AADT would only affect those decimal places that are never reported in air quality modelling to avoid false precision. For this reason, nitrogen deposition would generally not be reported to more than 2 decimal places at most (0.01kgN/ha/yr). Anything smaller would simply be reported as less than 0.01 (< 0.01) i.e. probably more than zero but too small to model with precision.
- 3.14 However, any significant accumulation of such developments not falling within the scope of the AECOM model would trigger the need for updated modelling. The AECOM model can be updated to include any development for which an operational/fully occupied trip generation can be provided in 24hr AADT for the relevant roads.
- 3.15 As a general rule, it is recommended that the Council's traffic and air quality models are referenced to evaluate any application, rather than requiring each application to undertake its own modelling. This will ensure consistency in assumptions and methodologies and avoid a proliferation of traffic and air quality models for the same geographic area. The potential exception may be for very large developments (e.g. hundreds or thousands of dwellings), or other forms of development that generate particularly large numbers of vehicle movements or unusual patterns of traffic generation for which a bespoke model is more likely to be justified.
- 3.16 The Council will review this Practice Note at regular intervals to ensure that it remains up to date. Such reviews will include consideration of, inter alia, whether the assumptions in the AECOM model on housing delivery rates, distribution of development, and background improvements in air quality continue to reflect – in general terms - the actual (or a more precautionary) situation. Upon adoption of the new Local Plan, a new Practice Note may be required.

⁸ The exception to this is planning application 17/02262/FULL, which was specifically included in the AECOM model based on traffic generation data supplied by the applicant.

Appendix A
Tunbridge Wells Borough: Ashdown Forest Air Quality Impact Assessment
2018